

INDIAN STATISTICAL INSTITUTE

Electronics and Communication Sciences Unit

Dr. Partha Pratim Mohanta Ph.D,
Associate Scientist 'C'

Life Member IUPRAI, Member ISI Council
(2016-18, 2018-20, 2020-22)



Residence:
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PIN – 700 114
INDIA

July 06, 2021

TO WHOM IT MAY CONCERN

This is to certify that Mr. Shubhajit Roy, Roll Number – 30318010040, Registration Number – 183030510039, a final-year student of Master of Computer Application (MCA) at Heritage Institute of Technology, Kolkata, India has successfully completed the Internship Project “Auto Generated Captions for Video Events Using Deep Neural Network” under my supervision during January 01 – June 30, 2021. The Internship Project report will be submitted in partial fulfillment of the requirements for 6th Semester of Masters of Computer Applications (MCA) Degree. He has extensively worked to extract visual features from pre-trained convolutional neural network (CNN) and gained a very good exposure of Recurrent Neural Network (RNN) model such as Long Short Term Memory (LSTM) network during the implementation of the project. He is sincere, hard working and target driven. I am satisfied about his performance during this Internship Project. I wish him success in all the future endeavors.

Sincerely,



Partha Pratim Mohanta, Ph.D.

INDUSTRIAL INTERNSHIP CERTIFICATE



This certificate is awarded to

CHANDRALEKHA KARMAKAR

of

HERITAGE INSTITUTE OF TECHNOLOGY

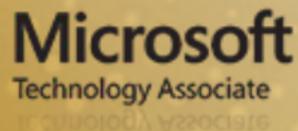
for successfully completing the Industrial Internship on

FULL STACK WEB DEVELOPMENT USING MERN STACK

from 18/Mar/2021 to 17/Jul/2021

and implementing the project titled

SOCIAL MEDIA WEBSITE



Director
Tehnology Services

Director
Operations



West Bengal State Electricity Distribution Company Limited

(A Government of West Bengal Enterprise)

WBSEDCL

HUMAN RESOURCE DEVELOPMENT DEPARTMENT

OFFICE OF THE GENERAL MANAGER (HRD&TRG)

Vocational Training Certificate

1. Name of the Trainee : *PARTHIBA ROY CHOWDHURY*
2. Name of the Institute : Heritage Institute of Technology
3. Stream : EE E&IE ME Civil CSE
IT ETC I&C
4. Period of Training : From 26.12.2019 To 09.01.2020
5. Training under Control of : Divisional Manager, Bidhannagar - II Division, WBSEDCL
6. Nature of Training : Operation & Maintenance activities of
Line & Sub Station upto 33 KV of WBSEDCL.

REMARKS

- a) Conduct : Excellent Very Good Good Satisfactory
- b) Work : Excellent Very Good Good Satisfactory
- c) Progress of Training : Excellent Very Good Good Satisfactory

Place : *Kolkata*

Date : *26.02.2020*

Adak
Authorised Signatory
[With seal]

Superintending Engineer (E)
H.R.D.C. W.B.S.E.D.C.L.
Bidyut Bhavan (5th Floor) D-Block
Bidhannagar, Kolkata-700091

WBSEDCL



CERTIFICATE OF TRAINING

Internet of Things

K Saravanan from **Heritage Institute of Technology** has successfully undergone a four weeks online winter training on Internet of Things. The training program consisted of Building an IoT Monitoring System, Controlling Devices Over the Internet, Cloud, APIs and Alerts and Machine Learning with IoT modules and lasted for four weeks from 15th January, 2020 to 14th February, 2020.

In the final assessment at the completion of the training program, K scored 96% marks.

We wish K all the best for future endeavours.

Sarvesh Agrawal

Founder & CEO

Date of certification: 2020-03-06

Certificate Number : 0017CD66-ADD3-9202-7E3E-360772B99C37

For certificate authentication please visit https://trainings.internshala.com/verify_certificate

Certificate of Experience



This is to certify that Mr. Tanmay Piyush Kaushik has worked with Tutree Inc. from 01th April 2020 to 31th August 2020 as a Software Development Intern.

We found him to be adaptable, team player, and hardworking. He worked sincerely on assignments entrusted to him. He could improve a bit more on Problem Solving skills

We wish him best of luck for the future.

A handwritten signature in black ink that reads "Preetika W".

Preetika Waikhom
Human Resources Manager
Tutree Inc.
5 September 2020

Certificate of Training

Prince Kumar

from **Heritage Institute of Technology** has successfully completed a six weeks online training on **AutoCAD** from 24th April, 2020 to 5th June, 2020. The training consisted of Interface, Drawing Aids & Basic Objects, Complex Objects & Object editing, Blocks & Annotations and Plotting & Introduction to 3D modules. Prince scored 93% marks in the final assessment and is a top performer in the training. We wish Prince all the best for the future.

A handwritten signature in black ink, appearing to read "Sarvesh".

Sarvesh Agrawal
Founder & CEO, Internshala

Date of certification: 2020-05-27

Certificate no. : C34921E5-3DBD-DDB9-C70A-43A6C1DC5BD1

For certificate authentication, please visit https://trainings.internshala.com/verify_certificate

Certificate of Training

HERITAGE INSTITUTE OF TECHNOLOGY, KOLKATA

This is to certify that Mr./Ms. Aniket Singh of Civil Engineering Department having roll number 1758030 has completed summer training on Comparative Analysis of Flexible and Rigid Pavement during 01/05/2020 to 30/05/2020 under the guidance of Prof. Rupam Sam.

Tapas Sadhu

Prof. Tapas Sadhu

(HOD)



Rupam Sam

Prof. Rupam Sam

(TRAINING GUIDE)



Indian Institute of Technology,
Kharagpur

Dr. Bhaskar Bhaduri

Department of Chemical Engineering

Indian Institute of Technology

Kharagpur, West Bengal, India

TO WHOM IT MAY CONCERN

This is to certify that **Ishika Mukherjee** (Roll no:12617006020/1755055), a B.Tech student from the department of Chemical Engineering, Heritage Institute of Technology, Kolkata performed her summer internship project under my supervision between 1st May and 6th June, 2020 via online mode. Her project title was “Adsorptive removal of carbamazepine in water using various adsorbents”. I am pleased to state that she really worked hard in preparing the report. Besides, she managed to present a good picture of the concerned works assigned to her. The information and findings presented in the report may be considered to be authentic.

Ishika possesses a good moral character and pleasing personality. I wish her every success in life.

Bhaskar Bhaduri

Dr. Bhaskar Bhaduri

Assistant Professor

Department of Chemical Engineering

Indian Institute of Technology Kharagpur

West Bengal, India-721302

Certificate ID: OSIP20/04-00507

Date of Issue: 30th July 2020



Online Summer Internship Programme (OSIP-2020)

23rd May-30th June, 2020

Indian Institute of Chemical Engineers

Dr. H. L. Roy Building, Jadavpur University Campus, Kolkata- 700 032

CERTIFICATE OF COMPLETION

This certificate is hereby awarded to

AKANKSHA PRIYA

from **Heritage Institute of Technology**

*who has successfully completed the INTERNSHIP PROGRAMME on the subject
Chemical Process Technology following all necessary criteria of the Institute
with "A+" Grade.*

Grading System :

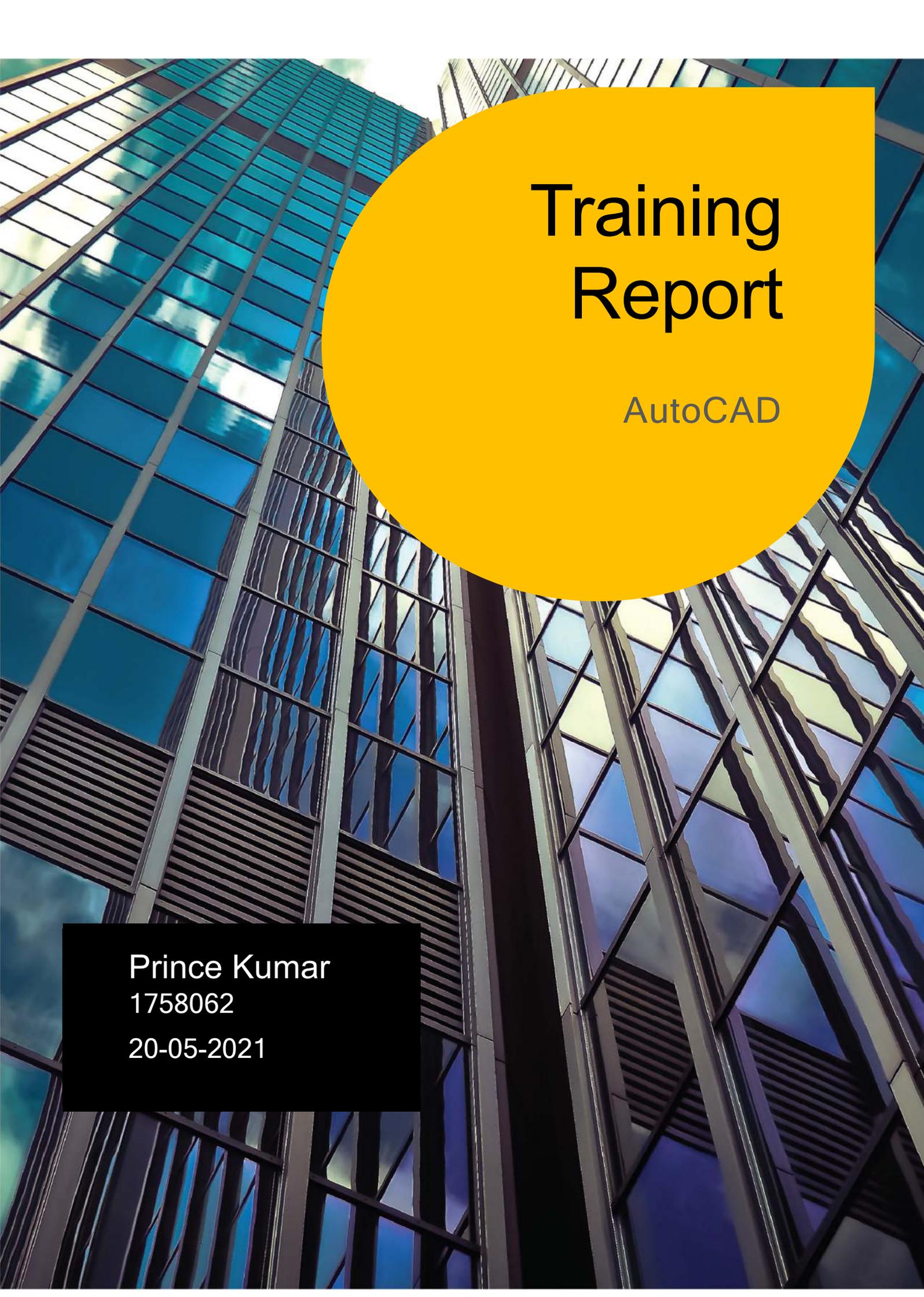
- A+ : 75% & Above
- A : 65% - 74%
- B : 55% - 64%



Prof. V. V. Basava Rao
President, IIChE

Dr. Gaurav Rattan
Honorary Registrar, IIChE

Dr. Avijit Ghosh
Honorary Secretary, IIChE
Convener, OSIP-2020



Training Report

AutoCAD

Prince Kumar

1758062

20-05-2021

Report of Summer Training

On AutoCAD

Completed by

Prince Kumar

From 25th April, 2020 to 5th June, 2020

Dept.: Civil Engineering

College Roll no.: 1758062

University Roll No: 12617013062

Submitted in partial fulfilment of the requirements

For the award of the Degree of

Bachelor of Technology

In

Civil Engineering



Heritage Institute of Technology, Kolkata

Prof. (Dr.) Tapas Sadhu
Head of Department

Prof. Rajashree Lodh
Assistant Professor

Certificate of Training

Prince Kumar

from **Heritage Institute of Technology** has successfully completed a six weeks online training on **AutoCAD** from 24th April, 2020 to 5th June, 2020. The training consisted of Interface, Drawing Aids & Basic Objects, Complex Objects & Object editing, Blocks & Annotations and Plotting & Introduction to 3D modules. Prince scored 93% marks in the final assessment and is a top performer in the training. We wish Prince all the best for the future.

A handwritten signature in black ink, appearing to read "Sarvesh".

Sarvesh Agrawal
Founder & CEO, Internshala

Date of certification: 2020-05-27

Certificate no. : C34921E5-3DBD-DDB9-C70A-43A6C1DC5BD1

For certificate authentication, please visit https://trainings.internshala.com/verify_certificate

DECLARATION

I hereby certify that the work which is being presented in the report entitled "AUTOCAD" in fulfilment of the requirement for completion of one month industrial training In department of Civil Engineering of "Heritage Institute Of Technology" is an authentic record of my own work carried out during industrial training.



Signature
(Prince Kumar)

The summer training viva-voce examination conducted by **Prof. Rajashree Lodh**, B.TECH (Civil Engineering) has been held on 24/05/2021.

Signature:

.....
(Signature)

Prof. (Dr.) Tapas sadhu

*Head of Department (Civil)
Heritage Institute of Technology.*

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ACKNOWLEDGEMENT

I am highly grateful to Dr. Basab Chaudhuri, Principal, Heritage Institute of Technology, for providing this opportunity to carry out one month online training at INTERNSHALA.

The constant guidance and encouragement received from *Prof. (Dr.) Tapas Sadhu, Head of Department of CIVIL Engineering*, has been of great help in carrying out the project work and is acknowledged with reverential thanks.

I would like to express a deep sense of gratitude and thanks profusely to my Instructor without the wise counsel and able guidance, it would have been impossible to complete the report in this manner.

I would like to express gratitude to other faculty members of civil department for their intellectual support throughout the course of this work.

Finally, I am indebted to all whosoever have contributed in this report work.

Prince Kumar
Civil Engineering
1758062

1. INTRODUCTION

AutoCAD is a commercial software application for 2D and 3D computer-aided design (CAD) and drafting — available since 1982 as a desktop application and since 2010 as a mobile web- and cloud-based app marketed as AutoCAD 360.

Developed and marketed by Autodesk, Inc., AutoCAD was first released in December 1982, running on microcomputers with internal graphics controllers. Prior to the introduction of AutoCAD, most commercial CAD programs ran on mainframe computers or minicomputers, with each CAD operator (user) working at a separate graphics terminal.

AutoCAD is used across a wide range of industries, by architects, project managers, engineers, graphic designers, and other professionals. It is supported by 750 training centres worldwide as of 1994.

As Autodesk's flagship product, by March 1986 AutoCAD had become the most ubiquitous CAD program worldwide. As of 2014, AutoCAD is in its twenty-ninth generation, and collectively with all its variants, continues to be the most widely used CAD program throughout most of the world.

Autodesk, Inc. is an American multinational software corporation that makes software for the architecture, engineering, construction, manufacturing, media, and entertainment industries. Autodesk is headquartered in San Rafael, California, and features a gallery of its customers' work in its San Francisco building. The company has offices worldwide, with U.S. locations in Northern California, Oregon, Colorado, Texas and in New England in New Hampshire and Massachusetts, and Canada locations in Ontario, Quebec, and Alberta.

The company was founded in 1982 by John Walker, a co-author of the first versions of AutoCAD, the company's flagship computer-aided design (CAD) software. It's AutoCAD and Revit software is primarily used by architects, engineers, and structural designers to design, draft, and model buildings and other structures. Autodesk software has been used in many fields, from the New York Freedom Tower to Tesla electric cars.

Autodesk became best known for AutoCAD but now develops a broad range of software for design, engineering, and entertainment as well as a line of software for consumers, including Sketchbook, Homestyle, and Pixar. The company makes educational versions of its software available at no cost to qualified students and faculty through the Autodesk Education Community, and also as a donation to eligible non-profits through Tech Soup Global. Autodesk's digital prototyping software, including Autodesk Inventor, Fusion 360, and the Autodesk Product Design Suite, are used in the manufacturing industry to visualize, simulate, and analyse real-world performance using a digital model during the design process.

1.1. What Is the Difference Between CAD and AutoCAD?

Computer-aided design (CAD) is the general term that applies to the use of computers in the design of houses, office buildings, interiors and anything else that previously required hands-on drafting. AutoCAD is a specific piece of software used by many architects and designers for commercial design purposes. Read on to find out about the uses of CAD and AutoCAD. Schools offering

1.2. CAD and AutoCAD Overview

AutoCAD is software that utilizes computer-aided design (CAD) principles in the modelling of buildings, manufactured goods, urban infrastructure and even fashion design. If you are an architect or designer, you might use AutoCAD software to create 2- and 3-dimensional drafts of custom home designs or renovations. If you work as a civil engineer, you can use

AutoCAD software to design improvements in roadways and make cities and towns more energy-efficient. Other industries and professions that employ CAD and make use of AutoCAD software include manufacturing, automotive technology and engineering.

1.3. Types of CAD

Depending on the type of work you perform, there are different forms of CAD that you could employ. Drafts that are 2-dimensional are flat, while 3-dimensional and 2.5-dimensional drawings show the depth and space of a design. You might use wireframe, surface and solid modelling to calculate the dimensions of a design or simulate what the inner structure of your design might look like.

1.4. AutoCAD Software

AutoCAD is a trademarked product of Autodesk. When you use AutoCAD, you have the ability to draft 2-D and 3-D designs and create photorealistic rendering. Because different fields use AutoCAD in specific ways, there are several versions of the AutoCAD application for a variety of work types, such as architecture, mapping and piping design.

2. HISTORY OF AutoCAD

AutoCAD was derived from a program begun in 1977 and released in 1979 called Interact CAD, also referred to in early Autodesk documents as Micro CAD, which was written prior to Autodesk's (then Marin chip Software Partners) formation by Autodesk cofounder Mike Riddle.

The first version by the Auto-Desk Company was demonstrated at the 1982 Comdex and released that December. The 2016 release marked the 30th major release for the AutoCAD for Windows. The 2014 release marked the fourth consecutive year for AutoCAD for Mac.

Autodesk's first notable product was AutoCAD, a computer-aided design application designed to run on the systems known as "microcomputers" at the time, including those running the 8-bit CP/M operating system and two of the new 16-bit systems, the Victor 9000 and the IBM Personal Computer (PC). This tool allowed users to create detailed technical drawings, and was affordable to many smaller design, engineering, and architecture companies.

Release 2.1 of AutoCAD, released in 1986, included Auto LISP, a built-in Lisp programming language interpreter initially based on XLISP. This opened the door for third party developers to extend AutoCAD's functionality, to address a wide range of vertical markets, strengthening AutoCAD's market penetration.

Subsequent to AutoCAD Release 13, the company stopped supporting the UNIX environment and the Apple Macintosh platform. After AutoCAD Release 14 (R13 was last DOS & UNIX release), first shipped in 1997, Autodesk discontinued development under DOS, and focused exclusively on Microsoft Windows.

AutoCAD has grown to become the most widely used CAD program for 2D non-specialized applications. The native file formats written by AutoCAD, DXF and DWG, are also widely used for CAD data interoperability.

In 1989, Autodesk's sales grew to over \$100,000,000 after just four operational years. In the 1990s, with the purchase of Soft desk in 1997, Autodesk started to develop specialty versions of AutoCAD, targeted to broad industry segments, including architecture, civil engineering, and manufacturing. Since the late 1990s, the company has added a number of significant non-AutoCAD-based products, including Revit, a building modelling application (acquired in 2002, from Massachusetts-based Revit Technologies for \$133 million), and Inventor, an internally developed parametric mechanical design CAD application. Autodesk introduced its current logo at the TED conference in Long Beach, California on February 26, 2013

3. AUTOCAD

3.1. INTRODUCTION

AutoCAD is a commercial computer-aided design (CAD) and drafting software application. Developed and marketed by Autodesk, AutoCAD was first released in December 1982 as a desktop app running on microcomputers with internal graphics controllers. Prior to the introduction of AutoCAD, most commercial CAD programs ran on mainframe computers or with each CAD operator (user) working at a separate graphics terminal. Since 2010, AutoCAD was released as mobile app as well, marketed as AutoCAD 360.

AutoCAD is used across a wide range of industries, by architects, project managers, engineers, graphic designers, and many other professionals.

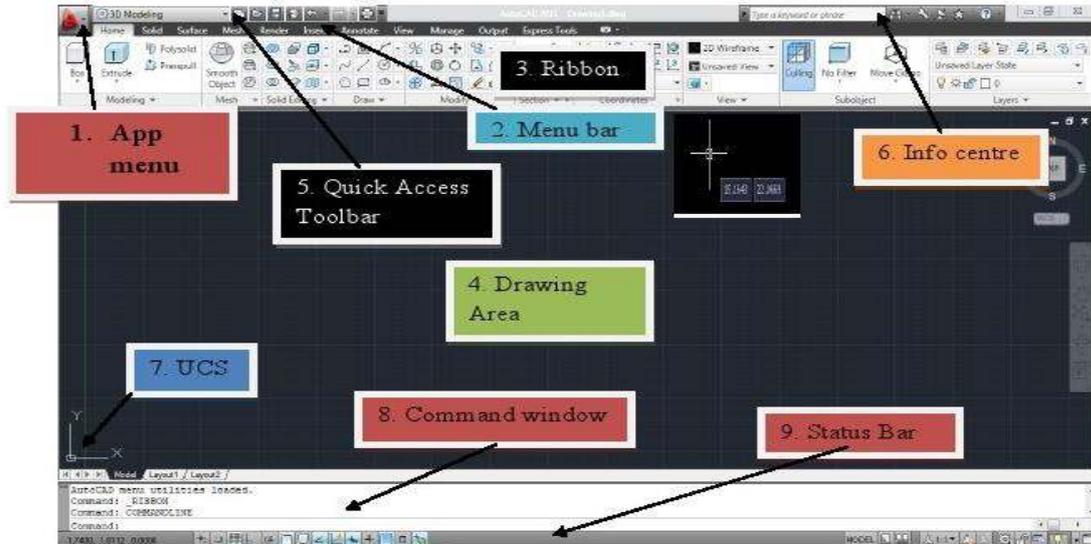
AutoCAD is available for English, German, French, Italian, Spanish, Korean, Chinese Simplified, Chinese Traditional, Brazilian, Portuguese, Russian, Czech, Polish and Hungarian, Albanian (also through additional Language Packs).

The latest version was released on 21st March 2017 as AutoCAD 2018.

3.2. AUTOCAD WINDOW

Once the AutoCAD 2014 window is active, it should appear as shown on the image shown below. However if you look at the upper left hand corner there is a button with the letter (A) written in red. That is called the application menu of the AutoCAD software. At the right of this button, there is the phrase “3D modelling”. This means that the active workspace is 3D modelling.

Fig. 1: 3D modeling workspace.



1. Application Menu

This provides the user with file options like save, open, print.

2. Menu bar

The menu bar that appears just below the title bar of the AutoCAD 2014 window. It has such tabs as home, solid, surface, mesh and view among others for the case of 3D workspace. If you switch to 2D Drafting & Annotation you find other tabs relevant to workspace. Depending on which tab you are on, you will see a collection of tool icons just below it which are organized into panels. The entire collection of tool icons is referred to as the ribbon. As a result the tabs on the menu bar are called ribbon tabs.

3. Ribbon

This is a collection of tool panels representing groups of tools and features where you will be selecting tools to draw, edit, or perform other functions. It occurs immediately below the menu bar. Clicking on any of the tabs on the menu bar will give you a different ribbon.

4. Drawing Area

This is a virtual sheet or modelling environment where your designs appear. It is a boundless area on which your designs are created on a 1:1 scale regardless of their actual life size. The drawing area is also called the canvas. In the default condition, the drawing area will have three icons on display:

- i. The user coordinate system icon at the bottom left corner.
- ii. The cross hairs or drawing cursor which may be at any position on the screen depending on whether the user has touched the mouse or not.
- iii. The view cube at the top right corner. This is very useful in 3D drawing because it facilitates viewing the object from multiple directions.

5. Quick Access toolbar

This includes the basic file-handling functions that you find in virtually all windows application programs. It occurs at the immediate right of the application menu. It carries such functions as workspace switching and title, new file, open file, save and undo among others.

6. Info Centre

This is AutoCAD's online help facility. If you are online type a query there in case you get stuck.

7. UCS

UCS stands for User Coordinate System. In the lower-left corner of the drawing area, you see an L-shaped arrow. This is the UCS icon, which tells you your orientation in the drawing. This icon becomes helpful as you start to work with complex 2D drawings and 3D models. The X and Y arrows indicate the X- and Y-axes of your drawing. The little Square at the base of the arrows tells you that you're in what is called the World Coordinate System (WCS. Whenever you launch AutoCAD you will be in the world coordinate system (WCS).

8. Command Window.

It's located just below the drawing area. As you type in commands on the command line, or pick commands on the ribbon panels, a message is displayed on the command window telling you what to do next. When you issue any command it may also display a list of options related to that command. By so doing it prompts you on your next move. Thus it is also known as the command prompt. The command window and the ribbon complement each other i.e. you can type commands on the command line or click on the ribbon icons. However the command prompts that appear on the command window prevent the user from getting confused.

9. Status Bar

The status bar is a thin strip of the AutoCAD window found between the command window and the taskbar. To the extreme left it carries the coordinate readout which indicates to the user the current position of the cursor. Towards the right next to the coordinate readout is the drawing aids panel which carries such tools as object snap, object snap tracking, dynamic UCS and polar tracking among others. These aids assist the user in managing snap and tracking actions. They are activated or deactivated by switching them on or off respectively. To the extreme right of the status bar we find another panel which contains the model and layout tabs, annotation scale and workspace switching tool (gear wheel icon) among others.

3.3. SELECTING WORKSPACE

A workspace is a task-oriented drawing environment oriented in such a way as to provide you with only the tools and interface elements necessary to accomplish the tasks relevant to that environment. You can switch between workspaces by using the Workspace Switching Tool. You can also customize the workspace the way you want and then save it. It will be appearing on the list of workspaces during switching and you can select it as an option.

Workspace switching tool takes the form of a gear wheel  located at the bottom right hand corner of the active window. Clicking on it produces a drop down list of other alternative workspaces. Clicking on either changes the workspace to the selected. Alternatively you can switch the workspace by clicking on the downward arrow besides the name of the current workspace on the quick access toolbar.

3.4. FILING AND DATA INPUT

AutoCAD file operations are similar to the file operations in any other Windows program. The general file handling commands include file saving, file opening, file closing and printing of drawings.

I. OPENING FILES

There are three ways to open a drawing in AutoCAD.

Using Application Menu

Click on Application Menu > Open

On the select file dialogue box that appears, browse through the folders in the Look in slot. This enables you to navigate to the folder where you've saved your drawing.

Clicking on a file allows you to look at a preview of the drawing.

Select OPEN.

Using the Quick Access Toolbar

Click on File pull down menu> Open

At the Select file dialogue box, browse through to the folder in the Look in slot.

Clicking on a file allows you to look at a preview of the drawing.

Now you can click Open in the select file dialogue box.

Using the command line

At the command prompt on the command line, type Open and enter.

At the Select file dialogue box, browse through to the folder in the Look in slot.

Clicking on a file allows you to look at a preview of the drawing.

Select OPEN.

3.5. COORDINATES ENTRY

1. OVERVIEW.

When a command prompts you for a point, you can use the mouse to specify a point, or you can enter a coordinate value at the command prompt. If the dynamic input is switched you can enter coordinate values in tooltips near the cursor.

Two-dimensional coordinates can be entered as either Cartesian (X, Y) or Polar coordinates.

I. Cartesian coordinate system

A Cartesian coordinate system has three axes, X, Y, and Z. when you enter coordinate values, you indicate a point's distance in units and its direction (+ or -) along the X, Y, and Z axes relative to the coordinate system origin (0,0,0).

In 2D, you specify points on the XY plane, also called the work plane. The X value of Cartesian coordinate specifies the horizontal distance, and the Y value specifies the vertical distance. The origin point (0, 0) indicates where the two axes meet.

II. Polar Coordinate System

Polar coordinates use a distance and an angle to locate a point.

III. Absolute and Relative Coordinates

i. Absolute coordinates

Represents a specific point in the current work plane relative to the origin point (0, 0). To enter an absolute coordinate, type the values as a Cartesian coordinate (X, Y) or Polar coordinate (distance, angle).

ii. Relative coordinate

A relative coordinate is a point specified with reference to the last point specified. We emphasize that it is with reference to your last specified point and not to the origin. This is the distinguishing aspect between relative and absolute coordinates.

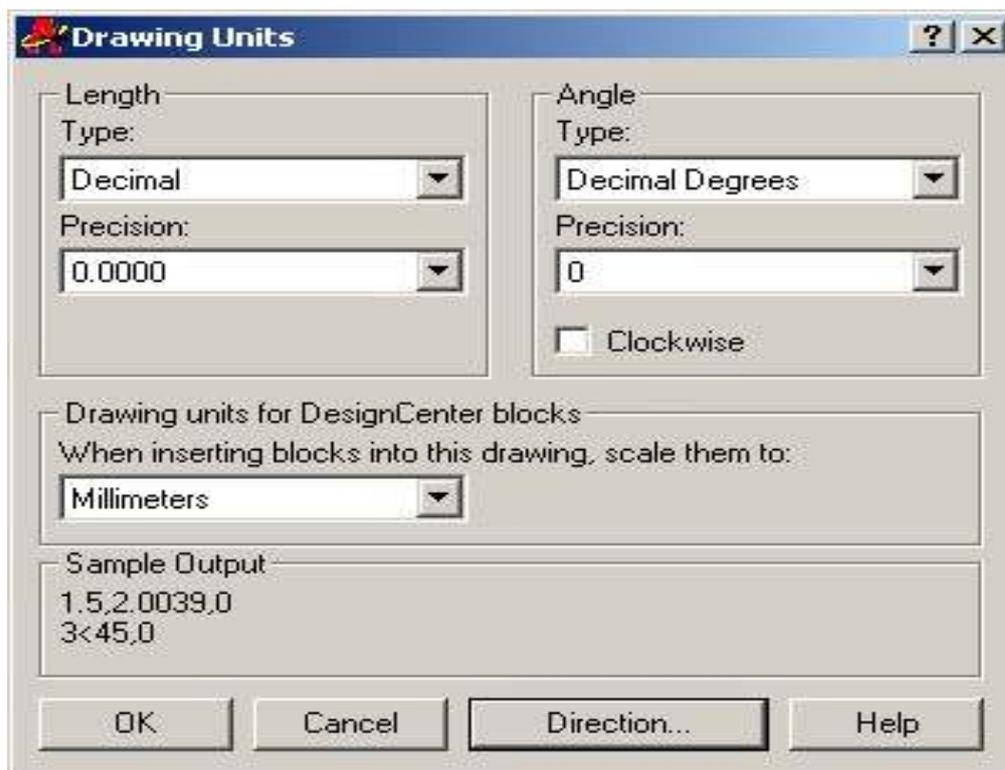
IV. Dynamic Input

When dynamic input is on, tooltips display information near the cursor as it moves. It is called dynamic input because the information moving with the cursor is updated with the motion of the cursor. If you type the X value and press tab, the X field (box) displays a lock icon, The Y field is active and you can enter its value. If you type the X value and press enter, the Y value is ignored and AutoCAD interprets it as direct entry. This procedure applies to any other set of fields for instance distance and angle.

3.6. DRAWING UNITS & LIMITS

UNITS

The format, precision, and other settings used to display coordinates, distances, and angles are set through this dialog box, and are saved in the current drawing. It is recommended that you save these settings to your drawing template files to reduce your setup time when you start a new drawing. The Drawing Units dialog box is displayed. Enter **-units** at the Command prompt to display options.



Limits:

When you start a new drawing, and then decide how much space I need for my drawing. Think of it as the size of your drawing area. Then you can define drawing correctly. Type LIMITS enter. Type 0, 0 as lower left corner then type or click the coordinate for upper right corner based on the units which is in Inches or mm.

Command: LIMITS

Reset Model space limits:

Specify lower left corner or [ON/OFF] <0.0000, 0.0000>: 0, 0

Specify upper right corner <100.0000, 100.0000>: 300,200

3.7. COMMANDS

1. OVERVIEW AND DEFINITIONS.

You communicate with AutoCAD by using tools and Menu options. These devices invoke AutoCAD commands.

I. What is a command?

It's a single-word instruction you give to AutoCAD telling it to do something such as draw a line (the line tool in the Draw Ribbon Panel) or erase an object (the Erase tool in the Modify Ribbon Panel). Whenever you invoke a command, by either typing it or selecting a menu option or tool, AutoCAD responds by presenting messages to you in the Command Window and the Dynamic Input display or by displaying a dialogue box. By right clicking during the drawing process, a context-sensitive short cut menu is displayed; i.e. if you are in the middle of a command, this menu displays a list of options specifically related to that command.

II. Command tools.

Move the arrow cursor to the Line tool and rest it there. Do not click yet. Hold it there for a little while and then for a longer while. You will see two tool tips. The first tip gives you the tool tip name and the keyboard command associated with the tool. The second tip gives a brief explanation of how to use the tool. This happens to all other tools on the ribbon. To be able to draw effectively with AutoCAD, you must learn how to tell AutoCAD what you want, and even more important, understand what AutoCAD wants from you.

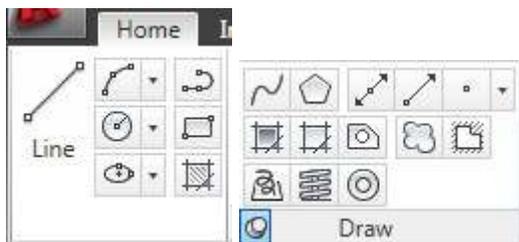
III. Methods of Accessing/Activating Commands.

- I. Clicking on the command tool/icon on the Ribbon Panels.
- ii. Typing the command on the Keyboard.

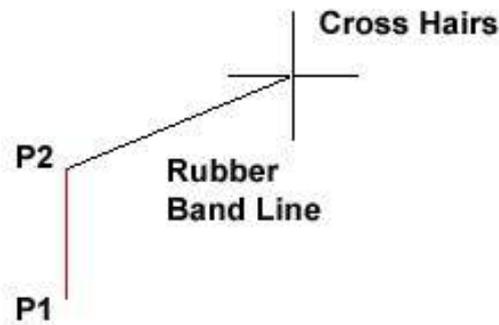
Use of Accelerator Keys. These are special keystrokes that open and activate drop down menu options. Example is Ctrl+z for save and Ctrl+C for copy.

- iv. Use of Aliases; (one, two or three letter abbreviations of a command name).
These are also typed on the key board.

2. Draw Command Tools



- i.  **Line:** With the Line command you can draw a simple line from one point to another.



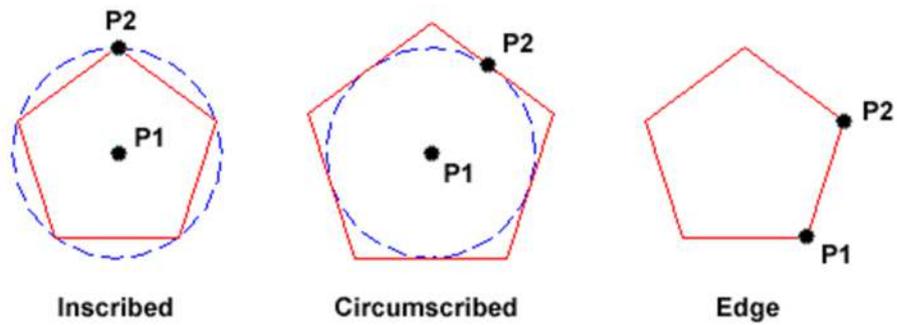
ii.  **Construction Line:** The construction line commands creates a line of infinite length which passes through two picked point.

iii.  **Polyline:** The Polyline command is similar to the line command except that the resulting object may be composed of a number of segments which form a single object.

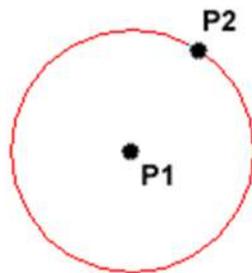
iv.  **Rectangle:** The Rectangle command is used to draw a rectangle whose sides are vertical and horizontal. The position and size of the rectangle are defined by picking two diagonal corners.



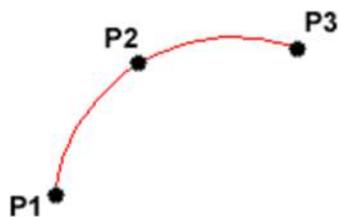
v.  **Polygon:** The Polygon command can be used to draw any regular polygon from 3 sides up to 1024 sides. This command requires four inputs from the user, the number of sides, a pick point for the centre of the polygon, whether you want polygon inscribed or circumscribed and then a pick point which determines both the radius of this imaginary circle and the orientation of the polygon. The polygon command creates a closed polyline in the shape of the required polygon.



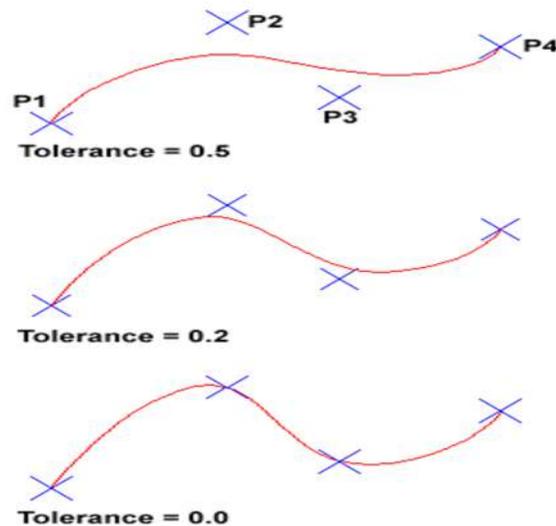
- vi.  **Circle:** The Circle command is used to draw circles. There are a number of ways you can define the circle. The default method is to pick the centre point and then to either pick a second point on the circumference of the circle or enter the circle radius at the keyboard.



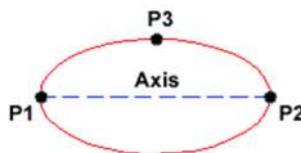
- vii.  **Arc:** The Arc command allows you to draw an arc of a circle. There are numerous ways to define an arc; the default method uses three pick points, a Start point, a second point and an end point.



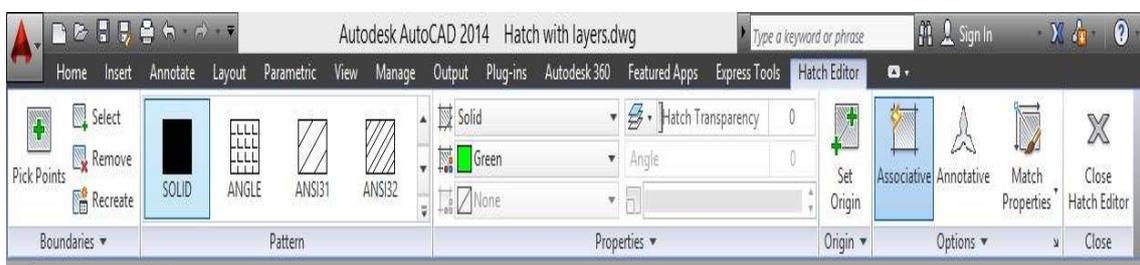
- viii.  **Spline:** A spline is a smooth curve that is fitted along a number of control points. The Fit Tolerance option can be used to control how closely the spline conforms to the control points. A low tolerance value causes the spline to form close to the control points.



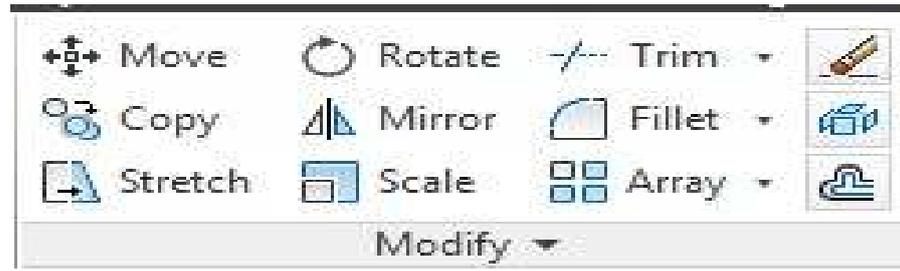
- ix.  **Ellipse:** The Ellipse command gives you a number of different creation options. The default option is to pick the two end points of an axis and then a third point to define the eccentricity of the ellipse.



- x.  **Hatch:** Hatch is used to add shaded patterns to objects and shapes. You can pick: Pattern, Scale, Angle, Points

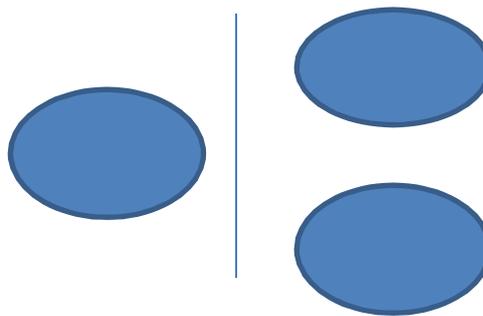


3. MODIFY COMMANDS



 **Offset:** Create a duplicate object parallel with the original object. If this object is a Polyline or a Circle, the duplicate shape will be transformed inwards or outwards.

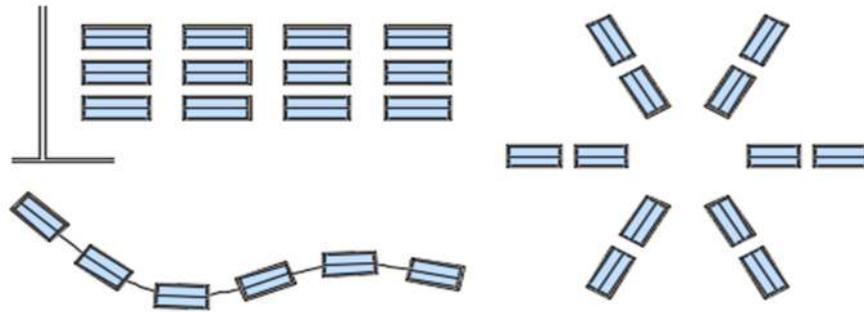
 **Copy:** Copy's one or more objects.



 **Mirror:** Create a mirror image of an object. It is useful for creating symmetrical objects because you can quickly draw half the object and then mirror it instead of drawing the entire object

 **Array:** Create copies of objects in a rectangular or polar pattern. This is especially useful when you need to duplicate several objects at the same distance from each other.

For rectangular arrays, you control the number of rows and columns and the distance between each. **For polar arrays,** you control the number of copies of the object and whether the copies are rotated.



 **Move:** Moves one or more objects.

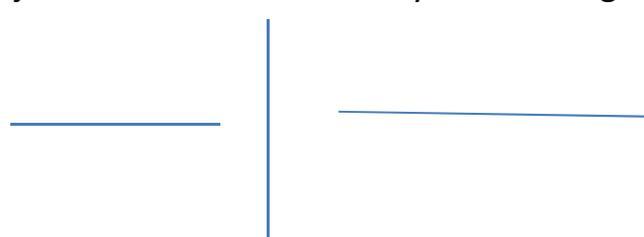
 **Rotate:** You can rotate objects with an absolute or relative angle. When using an absolute angle: Specify the base point and then specify the rotation angle.

 **Scale:** A scale factor greater than 1 enlarges the object. It is also possible to scale an object using a reference object. This method scales the object equally in all directions.

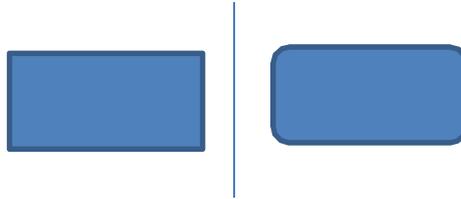


Trim: With the trim option objects can be shortened or lengthened with the edges of other objects. Objects can exactly be fitted between these objects.

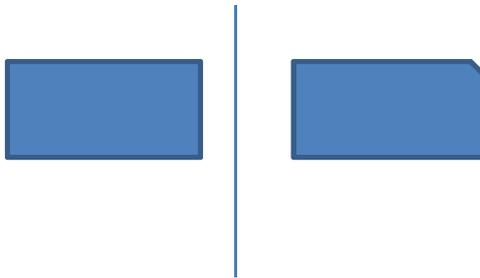
 **Extend:** With the extend option you can shorten or lengthen objects to meet the edges of other objects. For example a line can be exactly fitted between objects. Extending an object works in the same way as trimming.



 **Fillet:** You can use the fillet tool to connect two objects with an arc with a specified radius. The inside corner is called a fillet and an outside corner is called a round.



 **Chamfer** is almost identical to fillet, but it will make a straight line instead of an arc.



 **Join:** You can use the join option to combine similar objects into one single object. It is also possible to create complete circles from arcs.

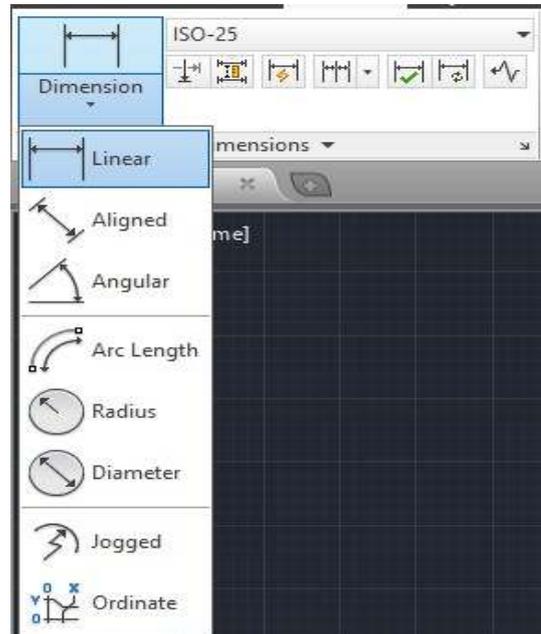


 **Explode:** Polylines, hatches or blocks can be converted into individual elements with the explode option. If you explode a polyline every segment will become a separate line.

3.8. ***DIMENSION TOOLBAR***

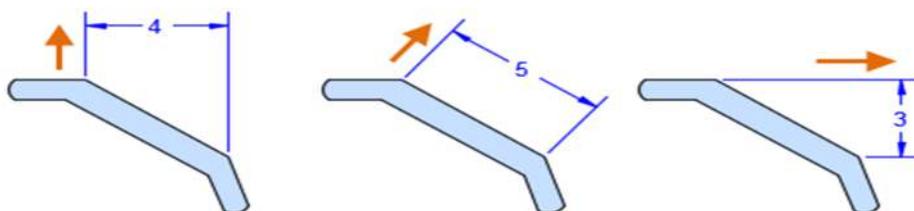
You can create several types of dimensions for a variety of object types in many orientations and alignments. The basic types of dimensioning are linear, radial, angular, ordinate, and arc length. Use the DIM command to create dimensions automatically according to the object type that you want to dimension.

You can control the appearance of dimensions by setting up dimension styles, or by editing individual dimensions in special cases. Dimension styles allow you to specify your conventions quickly and maintain industry or project dimensioning standards.

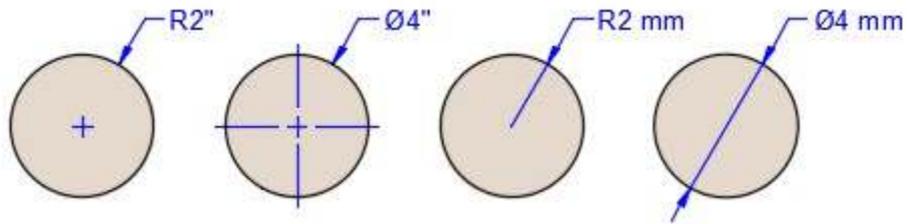


1. Linear Dimensions - Linear dimensions can be horizontal, vertical, or aligned.

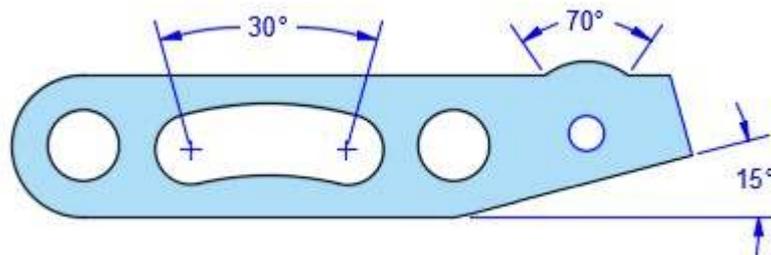
You can create an aligned, horizontal, or vertical dimension with the DIM Command depending on how you move the cursor when placing the text.



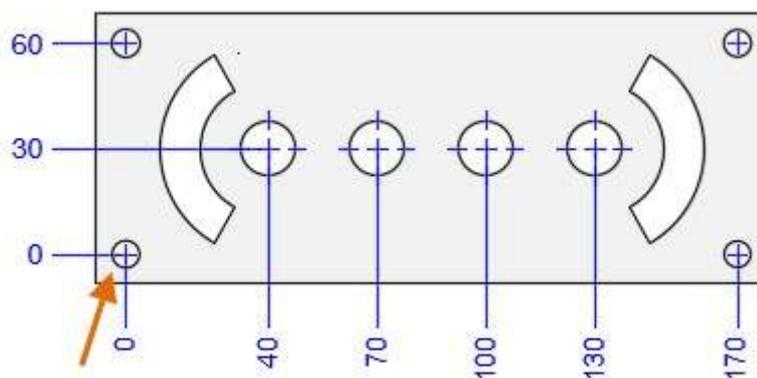
2. Radial Dimensions - A radial dimension measures the radius or diameter of arcs and circles with an optional centreline or centre mark.



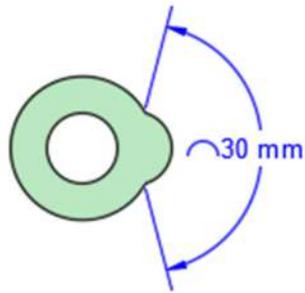
1. **Angular Dimensions** - Angular dimensions measure the angle between two selected geometric objects or three points.



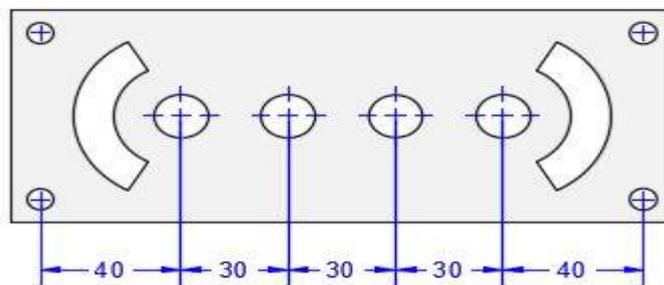
4. **Ordinate Dimensions** - Ordinate dimensions measure the perpendicular distances from an origin point called the *datum*, such as a hole in a part. These dimensions prevent escalating errors by maintaining accurate offsets of the features from the datum.



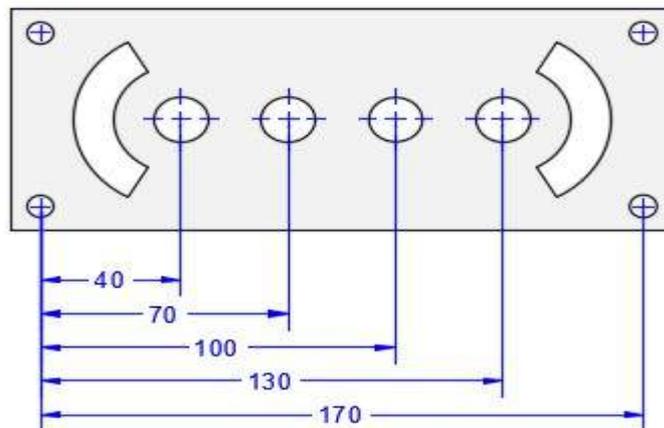
5. **Arc Length Dimensions** - Arc length dimensions measure the distance along an arc or polyline arc segment. Typical uses of arc length dimensions include measuring the travel distance around a cam or indicating the length of a cable.



6. Baseline and Continued Dimensions - Continued dimensions, also called chained dimensions, are multiple dimensions placed end-to-end.

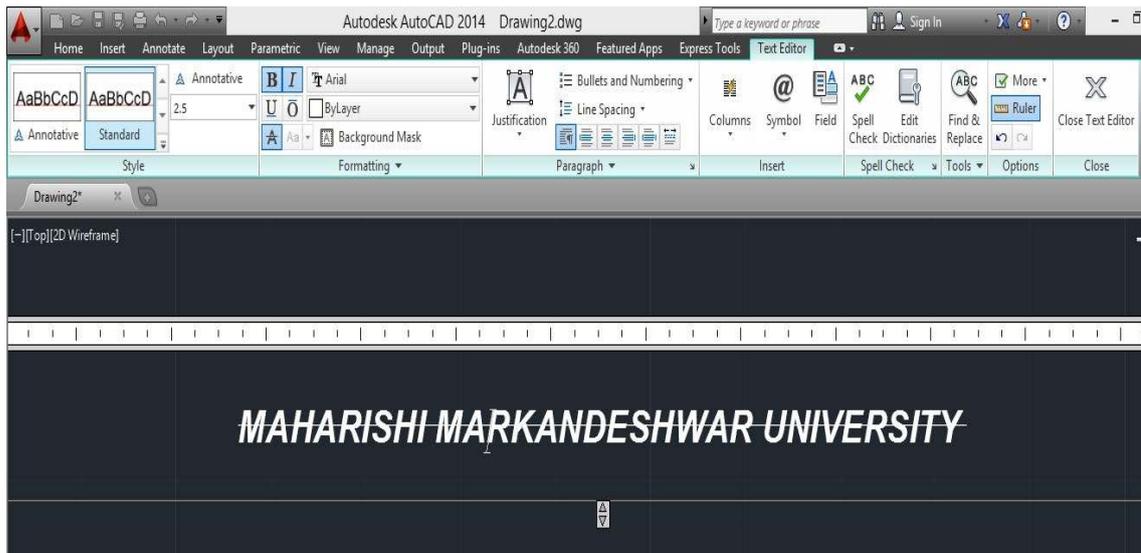


Baseline dimensions are multiple dimensions with offset dimension lines measured from the same location.



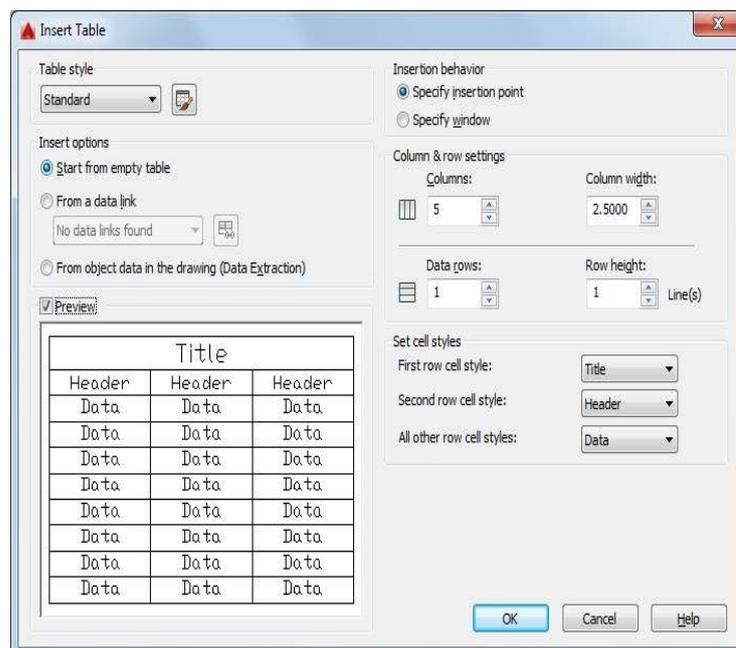
3.9. TEXT COMMAND

1. **A** **Multiline Text** - For longer notes and labels with internal formatting, use multiline text
2. **AI** **Single-line Text** - For short, simple notes and labels, use single-line text.



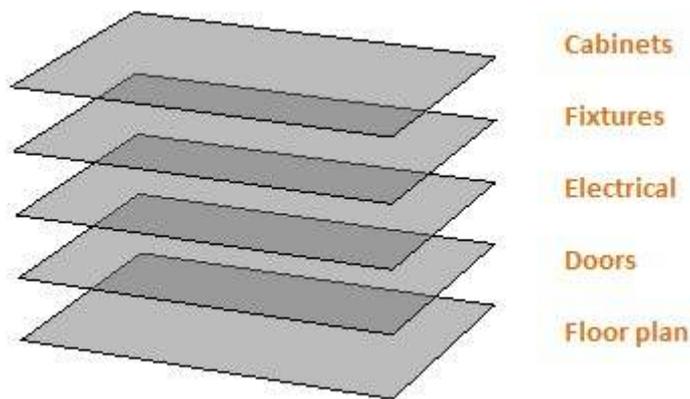
3.10. TABLE

A table is a compound object that contains data in rows and columns. It can be created from an empty table or a table style. A table can also be linked to data in a Microsoft Excel spreadsheet.



3.11. LAYER

Layers are the primary method for organizing the objects in a drawing by function or purpose. Layers can reduce the visual complexity of a drawing and improve display performance by hiding information that you don't need to see at the moment. You gain this level of control by organizing the objects in your drawing on layers that are associated with a specific function or a purpose. It might be helpful to think of layers as clear plastic sheets:

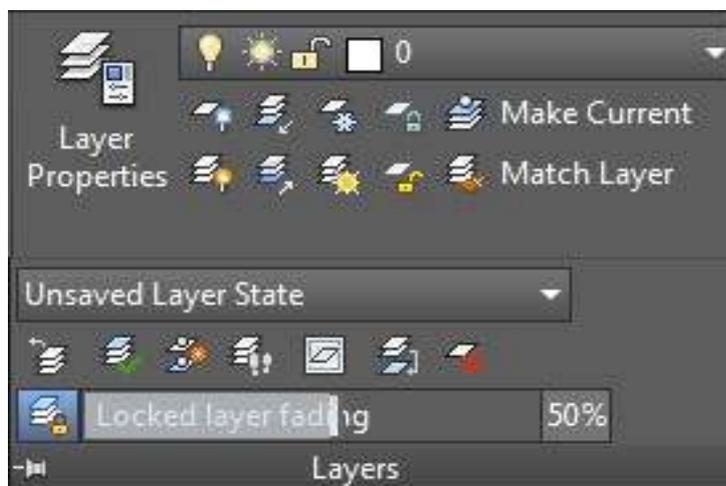


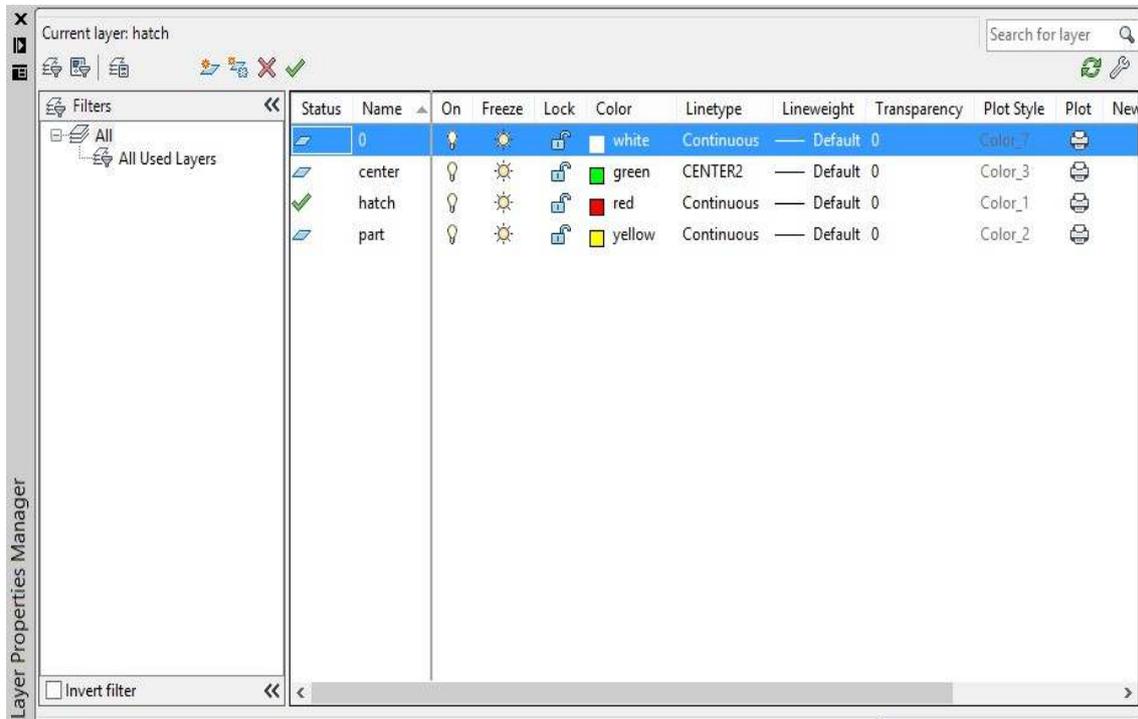
With layers, you can

- Associate objects by their function or location

- Display or hide all related objects in a single operation

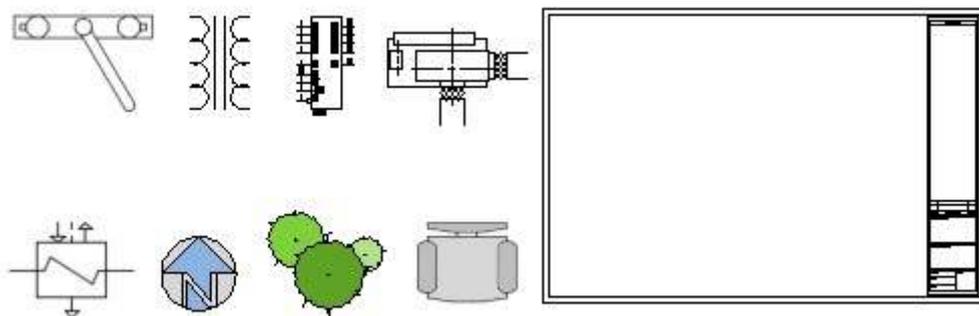
- Enforce line, type, colour, and other property standards for each layer





3.12. **BLOCK**

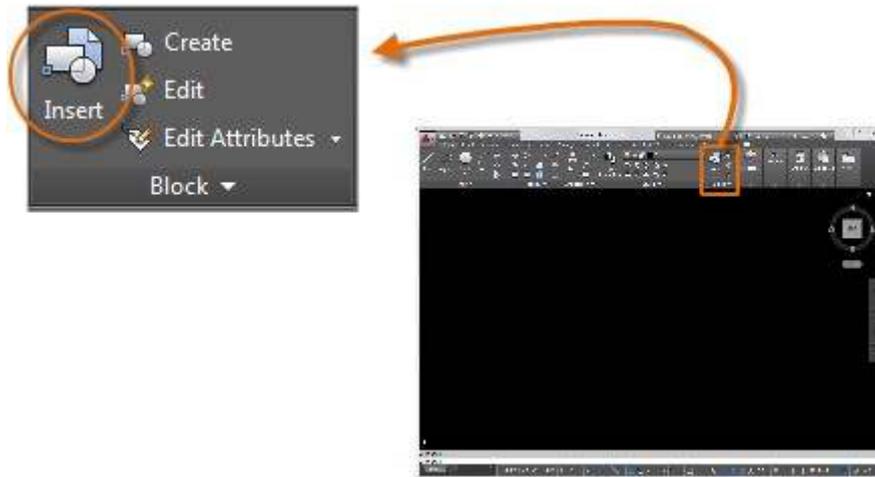
In AutoCAD, a block is a collection of objects that are combined into a single named object. The following are some sample blocks at various scales.



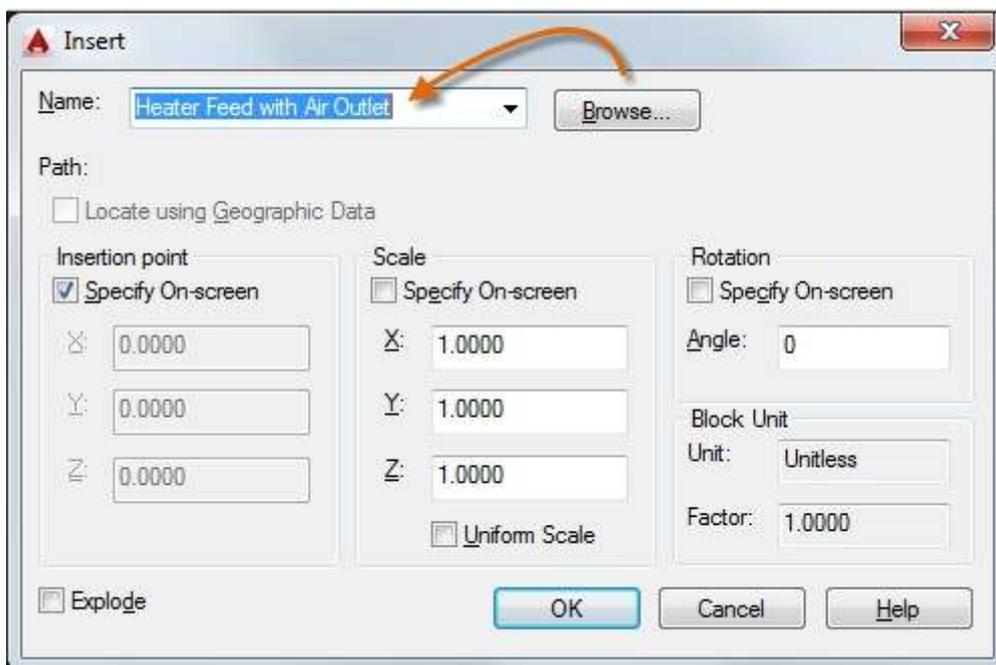
Some of these blocks are realistic representations of objects, some are symbols, and one of them is an architectural title block for a D-size drawing.

INSERT A BLOCK

Typically, each of these blocks is an individual drawing file, perhaps saved in a folder with similar drawing files. When you need to insert one into your current drawing file, you use the INSERT command (or enter me in the Command window).



The first time you insert the drawing as a block, you need to click Browse to locate the drawing file. Make sure you organize your blocks into easy-to-find folders.



Once inserted, the *block definition* is stored in your current drawing. From then on, you can choose it from the Name drop-down list without needing to click the Browse button.

CREATE A BLOCK DEFINITION

Instead of creating a drawing file to be inserted as a block, you might want to create a block definition directly in your current drawing. Use this method if you do not plan to insert the block into any other drawing. In that case, use the BLOCK command to create the block definition.



3.13. ISOMETRIC DRAWINGS

A 2D isometric drawing is a flat representation of a 3D isometric projection. This method of drawing provides a fast way to create an isometric view of a simple design. Distances measured along an isometric axis are correct to scale, but because you are drawing in 2D, you cannot expect to extract other 3D distances and areas, display objects from different viewpoints, or remove hidden lines automatically.

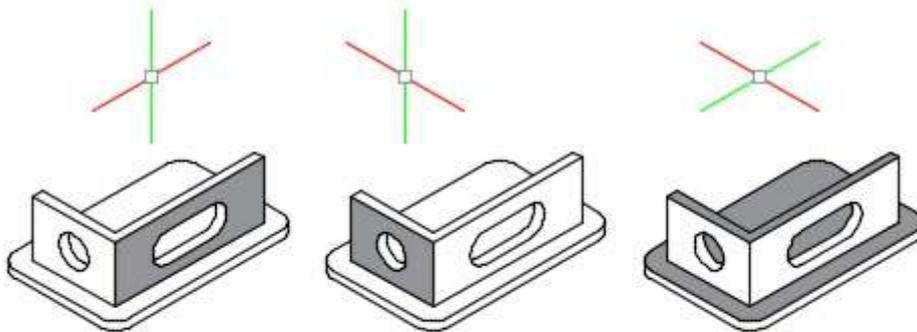
By using the ISODRAFT command, several system variables and settings are automatically changed to values that facilitate isometric angles. The standard isometric planes, called *isoplanes*, are as follows:

Right. Aligns snap and grid along 30- and 90-degree axes.

Left. Aligns snap and grid along 90- and 150-degree axes.

Top. Aligns snap and grid along 30- and 150-degree axes.

Choosing one of the three isoplanes automatically causes the crosshairs cursor, and precision drawing and tracking tools to be aligned along the corresponding isometric axes. Therefore, you can draw the top plane, switch to the left plane to draw a side, and switch to the right plane to complete the drawing.



You can use the Isometric Drafting tool on the status bar to select the desired isoplane. Alternatively, you can press F5 or Ctrl+E to cycles through the isoplanes.

3.14. PRINTING AND PLOTTING

Output a drawing layout to a printer, a plotter, or a file. Save and restore the printer settings for each layout. Originally, people printed text from printers and plotted drawings from plotters. Now, you can do both with either.



4. THE AUTOCAD ADVANTAGE

Striker Systems sheet metal fabrication products are available as a plug-in to AutoCAD or, for non-AutoCAD users, as a stand-alone solution based on the AutoCAD OEM Engine. Either way, this combination provides a unique CAD/CAM environment with features not found in many conventional manufacturing products.

Removal of Data Translations

Striker Systems provides a truly integrated CAD/CAM solution that supports the entire manufacturing process from initial part design through the generation of NC programs with no data translations required. And unlike many manufacturing software products with limited design capability, Striker Systems includes an advanced engineering system for the most demanding sheet metal design requirements.

SolidWorks / Solid Edge / Inventor Compatibility

The industry is rapidly embracing 3D solid modelling technology. Being based on Autodesk's industry standard DWG file format, Striker Systems offers a level of compatibility not found in other manufacturing solutions. Many products, such as Inventor and SolidWorks, support Striker's standard DWG file format directly. And Striker also offers direct OLE links into SolidWorks, Inventor and Solid Edge for seamless sharing of data.

Industry Standard Translators

Many Striker Systems clients must accept drawings from a variety of sources. In the event it is necessary to import data from (or export data to) another CAD software, Striker Systems relies on the same industry standard DXF, IGES, and STEP translators that are found in AutoCAD. Autodesk is the author of the DXF file format and therefore defines this standard. And because

AutoCAD is the most popular CAD software in the world, it is a benchmark for the development of translators by many other CAD software organizations. You are guaranteed the highest level of compatibility in the industry.

Reduced Training Time/Cost

Both the AutoCAD based and stand-alone Striker Systems products provide an enhanced user interface that will be immediately recognizable to individuals familiar with AutoCAD. They will readily adapt to the Striker environment thereby minimizing the learning curve. And for organizations that use AutoCAD as their engineering solution, it is not necessary for employees to learn multiple operating environments as they would with separate CAD and CAM solutions.

Rapid Product Advancements

Unlike the developers of stand-alone manufacturing products, the development team at Striker Systems is not forced to continually maintain and advance an underlying graphics database. The Striker graphics database is an AutoCAD engine, the world's de facto standard CAD solution. This allows the Striker Development Team to concentrate on feature development and advance software at a rapid pace.

5. THE DISADVANTAGES OF AUTOCAD

Autodesk AutoCAD is one of the most popular computer-aided design (CAD) programs, and it creates accurate, professional drawings. However, the program falls short for computer modelling and graphic design. The application has modelling tools, as well as colour and fill tools, but AutoCAD does not compare well to contemporary building information modelling (BIM), three- dimensional modelling or illustration software.

Line

AutoCAD produces drawings using line and shape tools. Curves, arcs and straight lines produce the shapes, but AutoCAD cannot edit the line and location as freely as illustration programs-- editing and overlapping lines and line weights is limited to a few options. In addition, AutoCAD creates drawings from only lines, never volumetric models, such as with BIM. Nevertheless, the application can produce precise three-dimensional geometry with limited material effects.

Limited File Formats

Because AutoCAD is one of the leading CAD programs, it limits the number of file formats it can import or export, because Autodesk expects other programs to export to AutoCAD formats, such as DWG and DXF. Unfortunately, this creates problems when using other programs with more powerful tools and exporting the program to an AutoCAD format-- geometry, colour and effects are lost often.

Colour, Fill and Texture

AutoCAD drawings and models can have colour, fill and texture, using the line and hatch tools. However, the application limits the number of possible colours to 256 and the hatching provides only a handful of textures, so you cannot create photo realistic images

like illustration programs. Instead, you can import image files and create material maps for AutoCAD renderings, but AutoCAD's rendering abilities cannot compete with three-dimensional modelling programs or illustration programs.

Non-Parametric

AutoCAD provides tools to create three-dimensional models, but editing the models requires many steps, unlike BIM parametric models, which automatically adjust all of the model components while editing elements. Furthermore, information is not attached to the models, such as with BIM parametric models-- BIM gives the designer data about the material and volumetric properties of the building project.

6. CONCLUSION

Internshala has a very good market in the internship program. The company is offering good services, which is reflected on the satisfaction of the customer. Majority of the interns are satisfied with the service. This is the only company which provide internship in India. It guides us to help to set up and manage a large project. It makes feel free to adjust the recommendations to suit the way we work.

This report covered the preview of our learning path and study materials. The use of AutoCAD has many advantages. It can help to reduce the time it takes to produce the drawing needed in the work environment. AutoCAD software is the most amazing range of mechanical computer aided design tool. It is now considered to be the best according to industry standards that can be obtained for a wide array of designing, Mechanical Engineering Services and other industrial purposes.

The use of AutoCAD may also be relied on heavily in order to create efficiencies within the industries. We explored different materials ranging from text, tutorials and Youtube videos so as get to grips with the finer details of mastering AutoCAD. We were guided by the fact that there is more to learning AutoCAD than drawing simple figures and lines. It has very vast application in the field of manufacturing, architecture, electrical, and many more. The company Autodesk provides wide range of application and software which reduces the effort to create complex drawing and easy to maintain. With the help of AutoCAD, we can create design very quickly. It improves the quality of the drawing which we can't get by hand drafting. With the help of this software, drawing can be easily modified whenever wanted which reduces the human effort. We can easily transfer files from one place to another in no time which reduces the time.

This software is utilized to provide some useful and practical designing software that will allow users to visualize as well as create prototypes of a product in reality and quick time. AutoCAD software allows developers to give form to their out of the box ideas.

