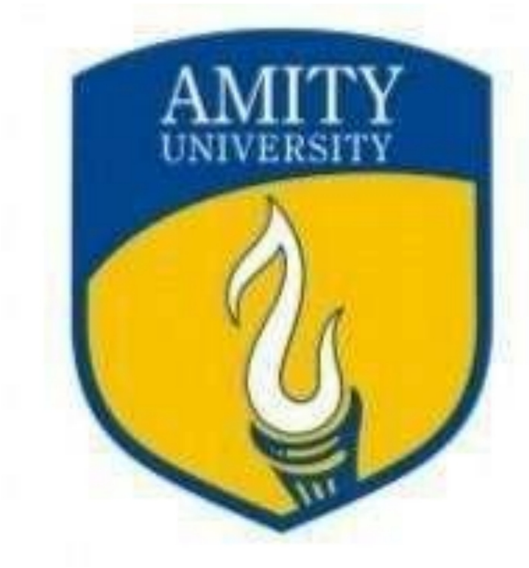
AMITY UNIVERSITY UTTAR PRADESH



PRACTICAL FILE REPORT

in the lab of

Basic Simulation Lab [redacted]

Submitted by: [redacted]

[redacted]

B.Tech. [redacted] X batch [redacted]

in partial fulfillment of requirements for the award of the degree of Bachelor of Technology

in

Computer Science and Engineering Submitted to:

Prof. [redacted]

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY AMITY UNIVERSITY UTTAR PRADESH

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S. No.	AIM	Submitted Date	SIGNATURE
1.	Creating a [redacted] and [redacted] array then perform arithmetic operation: - Addition of Arrays, Subtraction of Arrays, Multiplication of Arrays, Exponential of Array, Inverse of Matrix, Transpose of Matrix, Rank of Matrix, Plot of Matrix.	[redacted]	
2.	Performing Matrix Manipulations - Concatenating, Indexing, Sorting, Shifting, Reshaping, Resizing and Flipping about a Vertical Axis / Horizontal Axis; Creating Arrays X & Y of given size (1 x [redacted] and Performing [redacted] Relational Operations - >, <=, >=, ~= [redacted] Logical Operations - ~, &, |, XOR.	[redacted]	
3.	Generating a set of Commands on a given Vector. Add up the values of the elements. Compute the Running Sum, where Running Sum for element j = the sum of the elements from 1 to j, inclusive. Generating a Random Sequence using rand() / randn() functions and plot them.	[redacted]	
4.	:Evaluating a given expression and rounding it to the nearest integer value using Round, Floor, Ceil and Fix functions; Also, generating and Plots of [redacted] Trigonometric Functions - [redacted] and [redacted] for a given duration, 't'. [redacted] Logarithmic and other Functions – [redacted] Square root of A, Real nth root of A.	[redacted]	
5.	Generating a Sinusoidal Signal of a given frequency with Titling, Labeling, Adding Text, Adding Legends, Printing Text in [redacted] Letters, Plotting as Multiple and Subplot. Time scale the generated signal for different values. E.g. 2X, 4X, 0.25X, 0.0625X.	[redacted]	
6.	Creating a vector X with elements, Xn = [redacted] and Adding up 100 elements of the vector, X; And, plotting the functions, x, x3 , ex , exp(x2 [redacted] over the interval 0 < x < 4 (by choosing appropriate mesh values for x to obtain smooth [redacted] on A Rectangular Plot	[redacted]	

7.	Writing brief Scripts starting each Script with a request for input (using [redacted] to Evaluate the function [redacted] using [redacted] statement, where, [redacted] for 0 < T < 100 ♣ = (0.45 T + [redacted] for T > 100.	[redacted]	
8.	Generating a Square Wave from sum of Sine Waves of certain Amplitude and Frequencies	[redacted]	
9.	plot projectile trajectories using equations for ideal projectile motion where [redacted] is the vertical distance and [redacted] is the horizontal distance traveled by the projectile in metres, g is the acceleration due to Earth's gravity = 9:8 m/s2 and t is time in seconds. Let us assume that the initial velocity of the projectile v0 = 50:75 m/s and the projectile's launching angle 0 = 512 radians. The initial vertical and horizontal positions of the projectile are given by y0 = 0 m and x0 = 0 m. Let us now plot y vs. t and x vs. t in two separate graphs with the vector: t=0:0.1:10 representing time in seconds. Give appropriate titles to the graphs and label the axes.	[redacted]	
10.	Solving First, Second and third Order Ordinary Differential Equation using [redacted] Functions and plot.	[redacted]	
11.	Basic 2D and 3D plots, polygons with vertices. 3D contour lines, pie and bar charts.	[redacted]	

Experiment 11

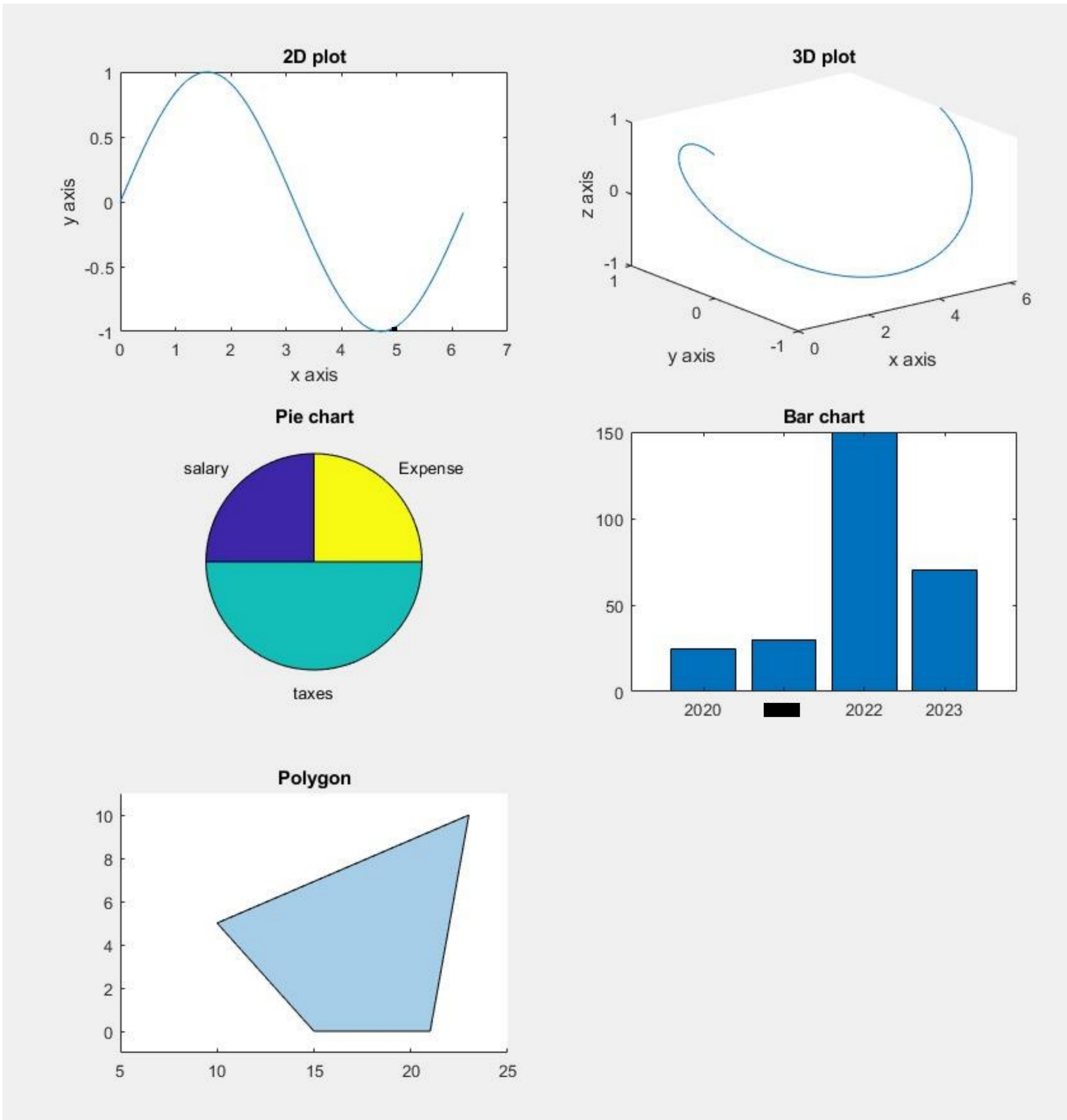
AIM: Basic 2D and 3D plots, polygons with vertices. 3D contour lines, pie and bar charts.

SOFTWARE: - MATLAB (Matrix [redacted]

Program –

```
% 2D plot
t=0:0.1:2*pi;
[redacted]
subplot [redacted]
plot [redacted]
xlabel("x [redacted]
ylabel("y [redacted]
title ("2D [redacted]

% 3D plot
[redacted]
subplot [redacted]
plot3 [redacted]
xlabel("x [redacted]
ylabel("y [redacted]
zlabel("z [redacted]
title ("3D [redacted]

% Pie chart
X = [0.25 0.5 0.25]
subplot [redacted]
labels = ["salary","taxes", "Expense"]
pie [redacted]
title ("Pie [redacted]


% Bar chart
A = [25 30 150 70 ]
subplot [redacted]
labels = ["2020"[redacted],"2022","2023"]
bar (labels, [redacted]
title ("Bar [redacted]

% % Polygon
P1 = polyshape ([10 15 [redacted] 23], [redacted] 00 00 [redacted]
subplot [redacted]
plot [redacted]
title [redacted]
```

Result –



Conclusion :

This experiment demonstrated MATLAB's ability to create **2D and 3D plots, polygons, contour lines, and bar/pie charts** for effective data visualization. These tools help in analyzing functions, geometric shapes, and data distributions, [redacted] MATLAB essential for scientific and engineering applications.