MATLAB ASSIGNMENT-3
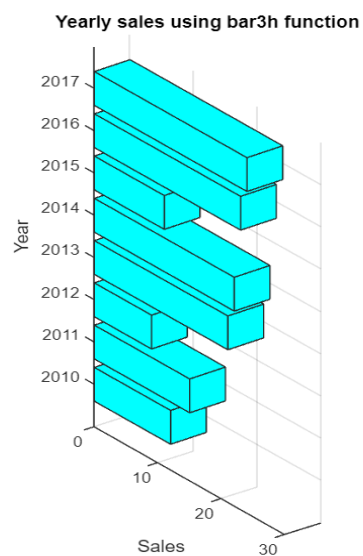## ~ CHARVI JAIN (113)

1. **Draw a 3D plot for horizontal, pie, bar, line for the given data.**

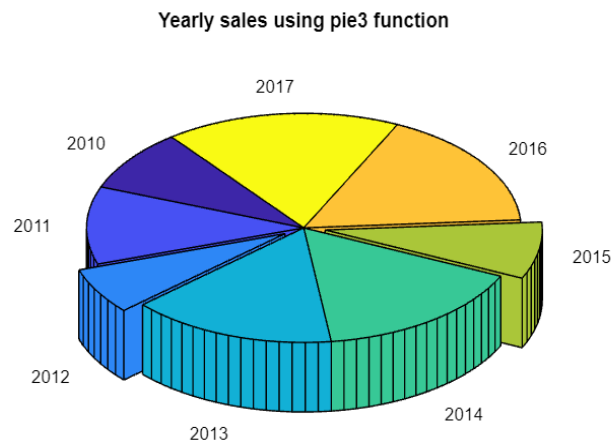| Year	Sales
2010	12
2011	15
2012	9
2013	21
2014	22
2015	11
2016	23
2017	24

```
%command for 3D horizontal bar graph using bar3h
year=[2010 2011 2012 2013 2014 2015 2016 2017];
sales=[12 15 9 21 22 11 23 24];
bar3h(year,sales,'c');
title('Yearly sales using bar3h function');
zlabel('Year');
ylabel('Sales');
```

```
%command for 3D plot using pie3
year=[{'2010', '2011', '2012', '2013', '2014', '2015', '2016', '2017'}];
sales=[12 15 9 21 22 11 23 24];
explode=[0 0 1 0 0 1 0 0];
pie3(sales,explode,year);
title('Yearly sales using pie3 function');
```
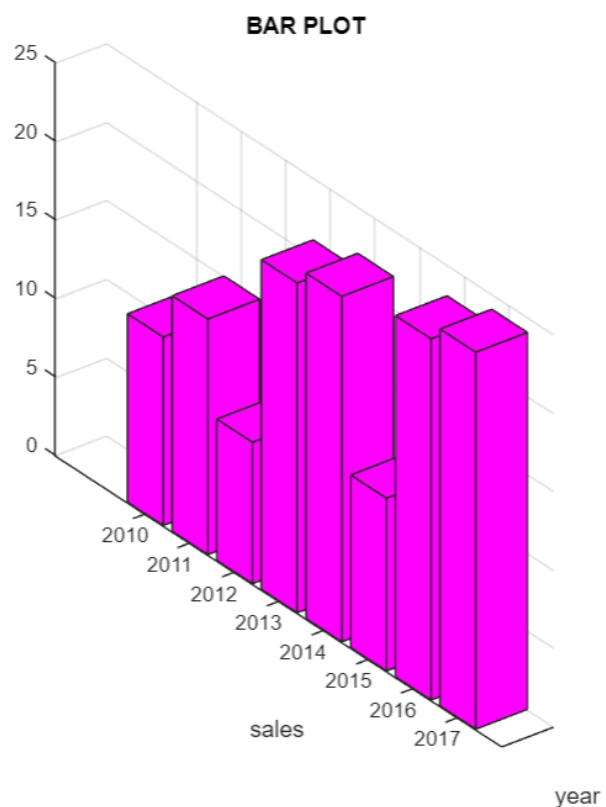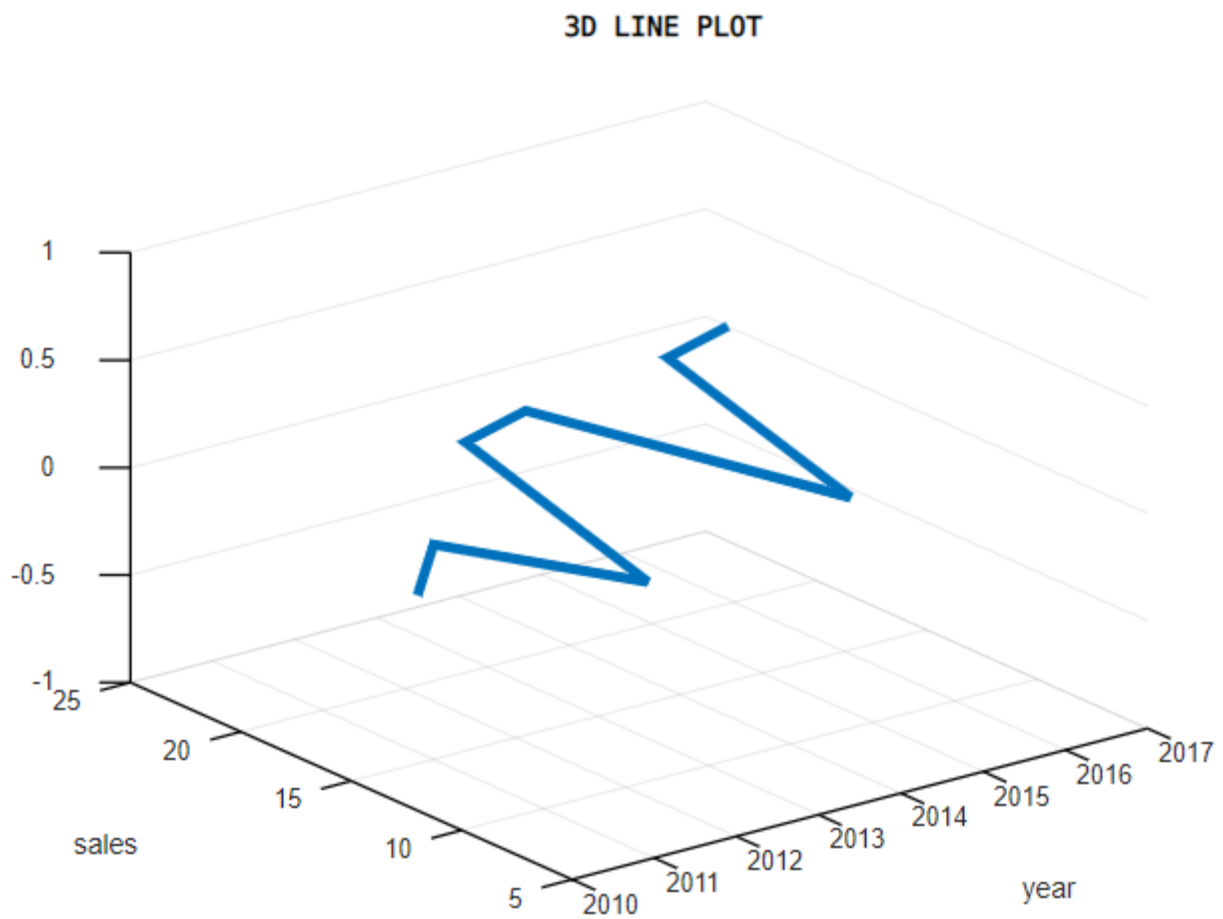
Yearly sales using pie3 function


```
%command for 3D bar
year=[2010 2011 2012 2013
2014 2015 2016 2017];
sales=[12 15 9 21 22 11 23
24];
figure
bar3(year,sales,'m')
xlabel('year');
ylabel('sales');
title('BAR PLOT');
grid on
```

Line:

```
year=[2010:2017];
sales=[12 15 9 21 22 11 23 24];
figure
plot3(year,sales,'LineWidth',4);
xlabel('year');
ylabel('sales');
title('3D LINE PLOT');
grid on
```

3D LINE PLOT

**2. Draw multiple plots in the same graphical window for the given data.**
X value lies between 0 and 20
Y1= sin2x+4
**Y2=cosx+6**
Y3=sinx+x

```
x=[0:20];
y1=(sin(2*x)+4);
y2=cos(x)+6;
y3=sin(x)+x;
z=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0]
disp(x)
subplot(3,1,1)
plot3(x,y1,z,'b','LineWidth',2);
xlabel('X');
ylabel('Y1');
subplot(3,1,2)
plot3(x,y2,z,'m','LineWidth',2);
xlabel('X');
ylabel('Y2');
subplot(3,1,3)
plot3(x,y3,z,'g','LineWidth',2);
xlabel('X');
ylabel('Y3');
xlabel('X');
ylabel('Y1');
```
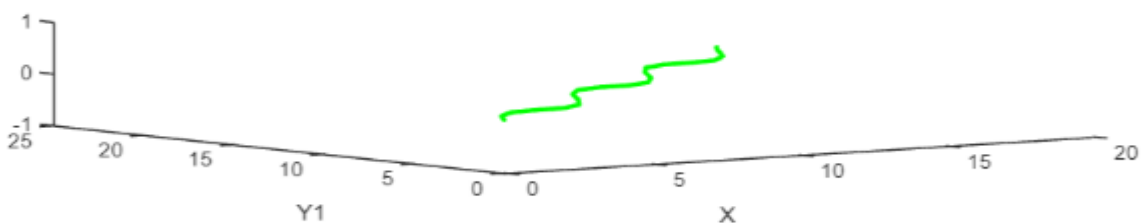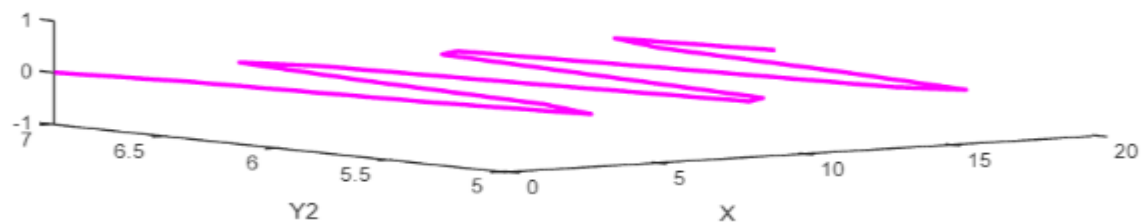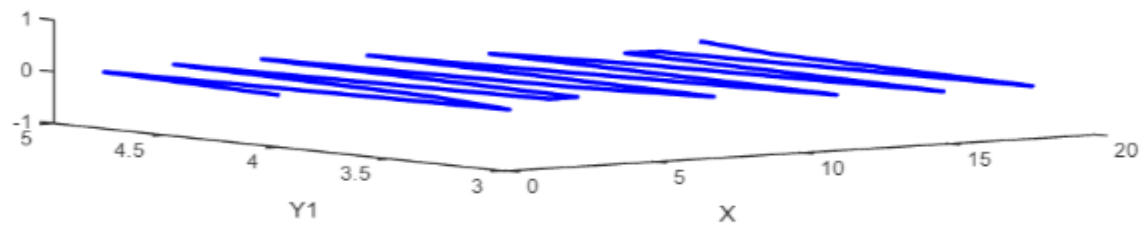
3.Draw multiple 3D plots for the data given in Q1 with different style options.
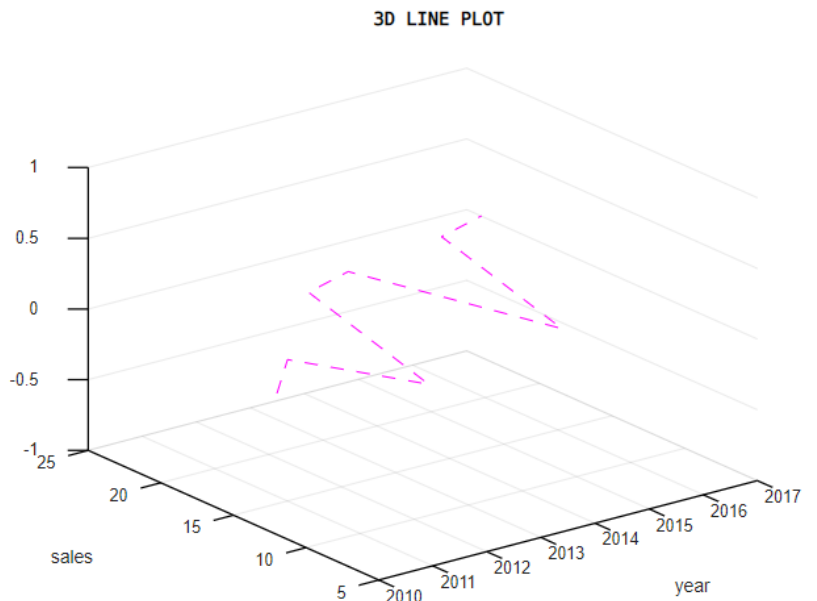
Pie:

```
sales = [12 15 9 21 22 11 23 24];
explode = [1 1 1 1 1 1 1 1];
label = {"2010", "2011", "2012", "2013", "2014", "2015", "2016", "2017"};
pie3(sales, explode, label);
legend(label)
title('PIE CHART OF SALES FOR THE CORRESPONDING YEAR')
```
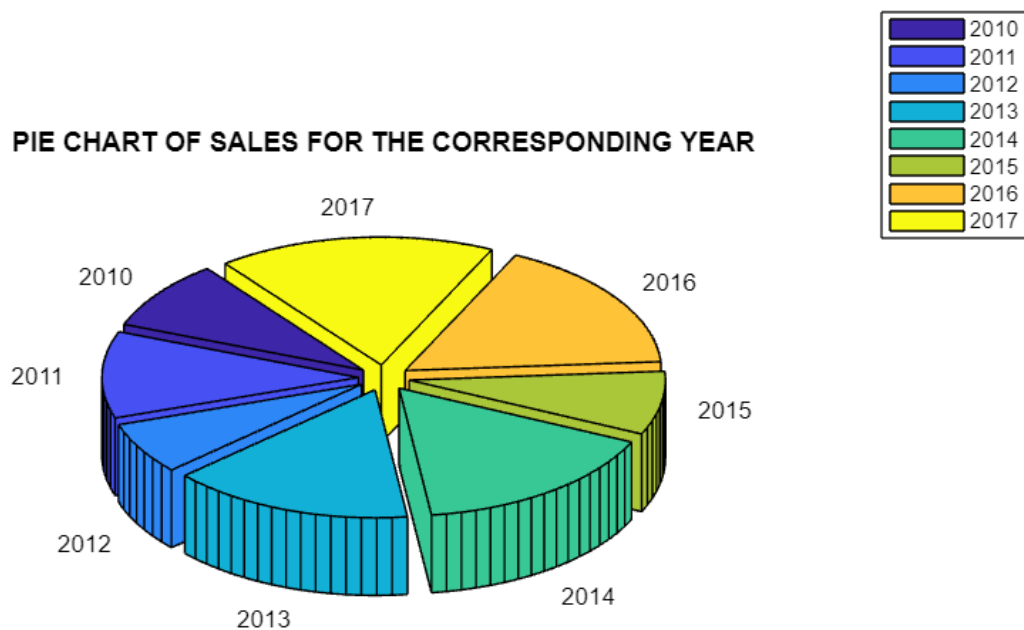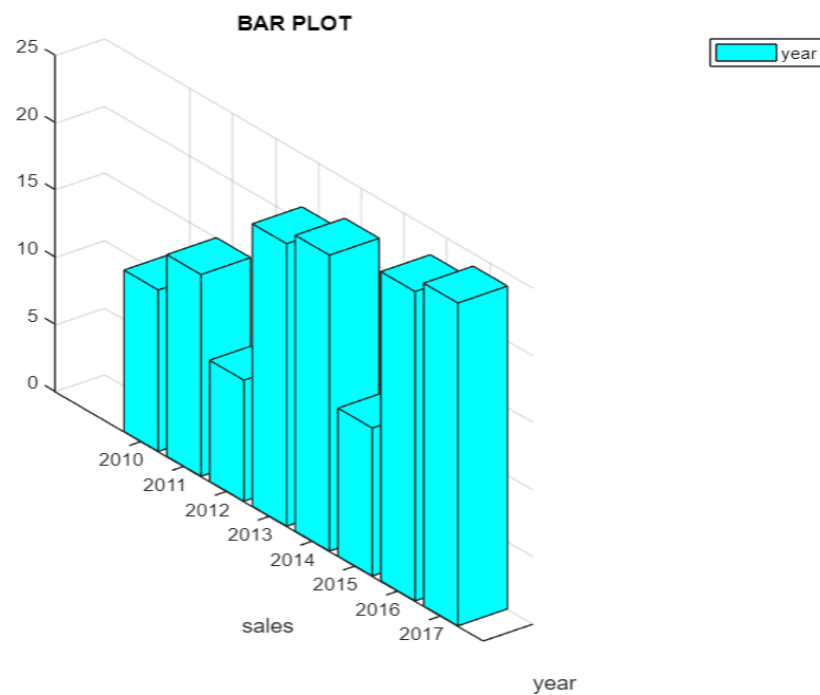

Line:

```
year=[2010:2017];
sales=[12 15 9 21 22 11 23
24];
figure
plot3(year,sales,'m--
','LineWidth',0.8);
xlabel('year');
ylabel('sales');
title('3D LINE PLOT');
grid on
```

Bar:

```
year=[2010 2011 2012 2013 2014 2015 2016 2017];
sales=[12 15 9 21 22 11 23 24];
figure
bar3(year,sales,'c')
xlabel('year');
ylabel('sales');
title('BAR PLOT');
legend('year')
grid on
```
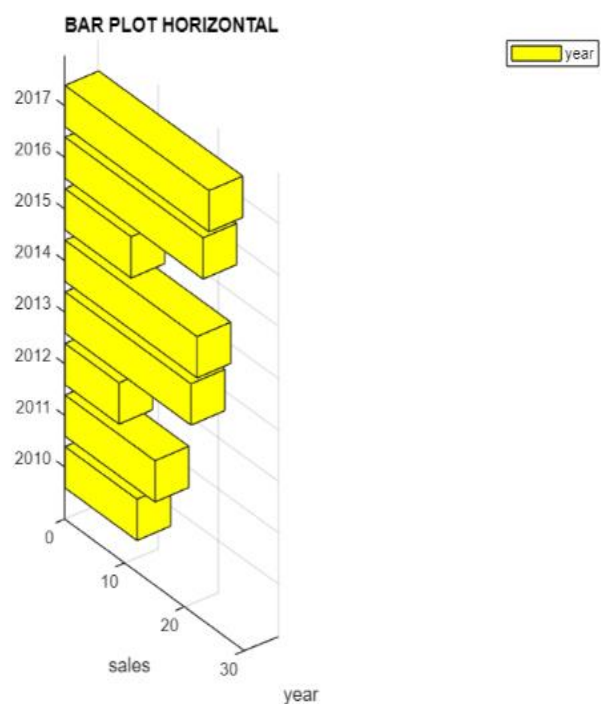

Horizontal:

```
year=[2010 2011 2012 2013
2014 2015 2016 2017];
sales=[12 15 9 21 22 11 23
24];
figure
bar3h(year,sales,'y')
xlabel('year');
ylabel('sales');
title('BAR PLOT HORIZONTAL');
legend('year')
grid on
```

4. Draw multiple plots in the same graphical window for the data given in Q2 with different x values.
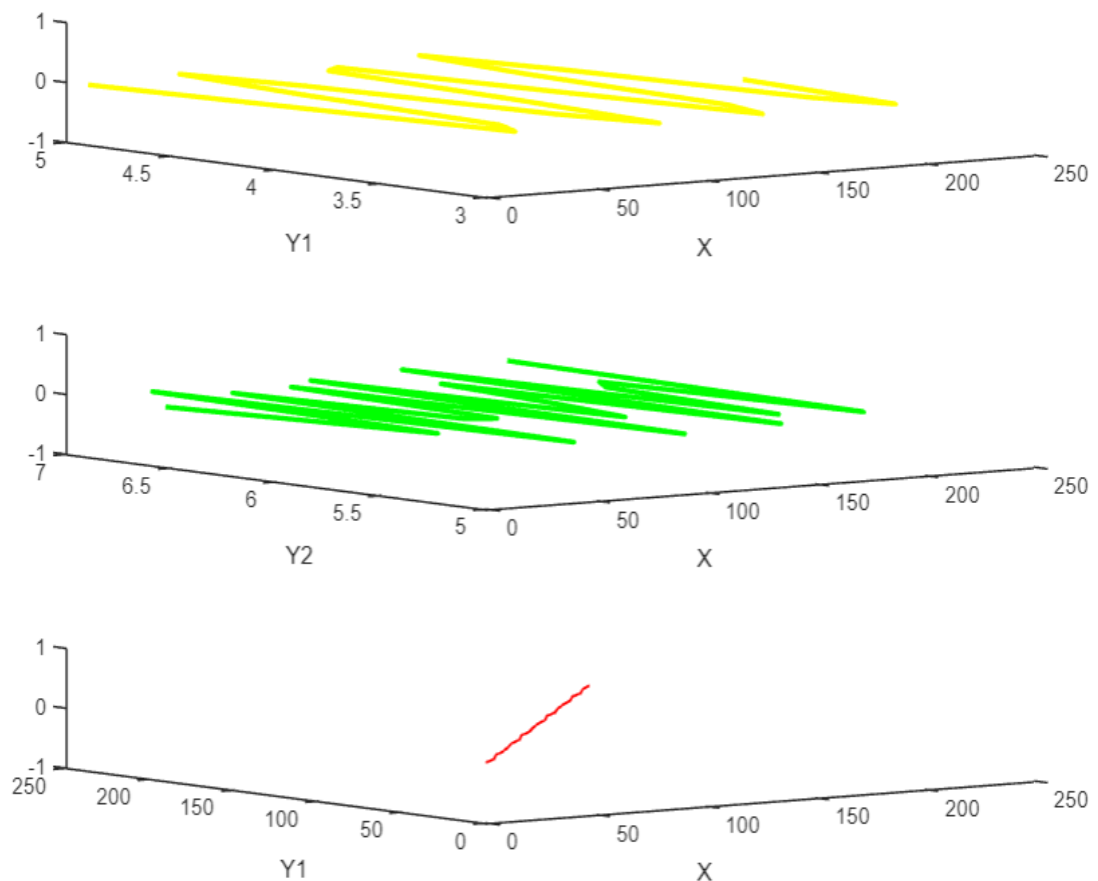
2D plot:
```
x=[1:10:1000];
y1=(sin(2*x)+4);
y2=cos(x)+6;
y3=sin(x)+x;
subplot(3,1,1)
plot(x,y1,'b','LineWidth',0.5);
xlabel('X');
ylabel('Y1');
title('X vs. Y1');
grid on
subplot(3,1,2)
plot(x,y2,'g','LineWidth',0.5);
xlabel('X');
ylabel('Y1');
title('X vs. Y2');
grid on
subplot(3,1,3)
plot(x,y3,'r','LineWidth',0.5);
xlabel('X');
ylabel('Y1');
title('X vs. Y3');
grid on
```
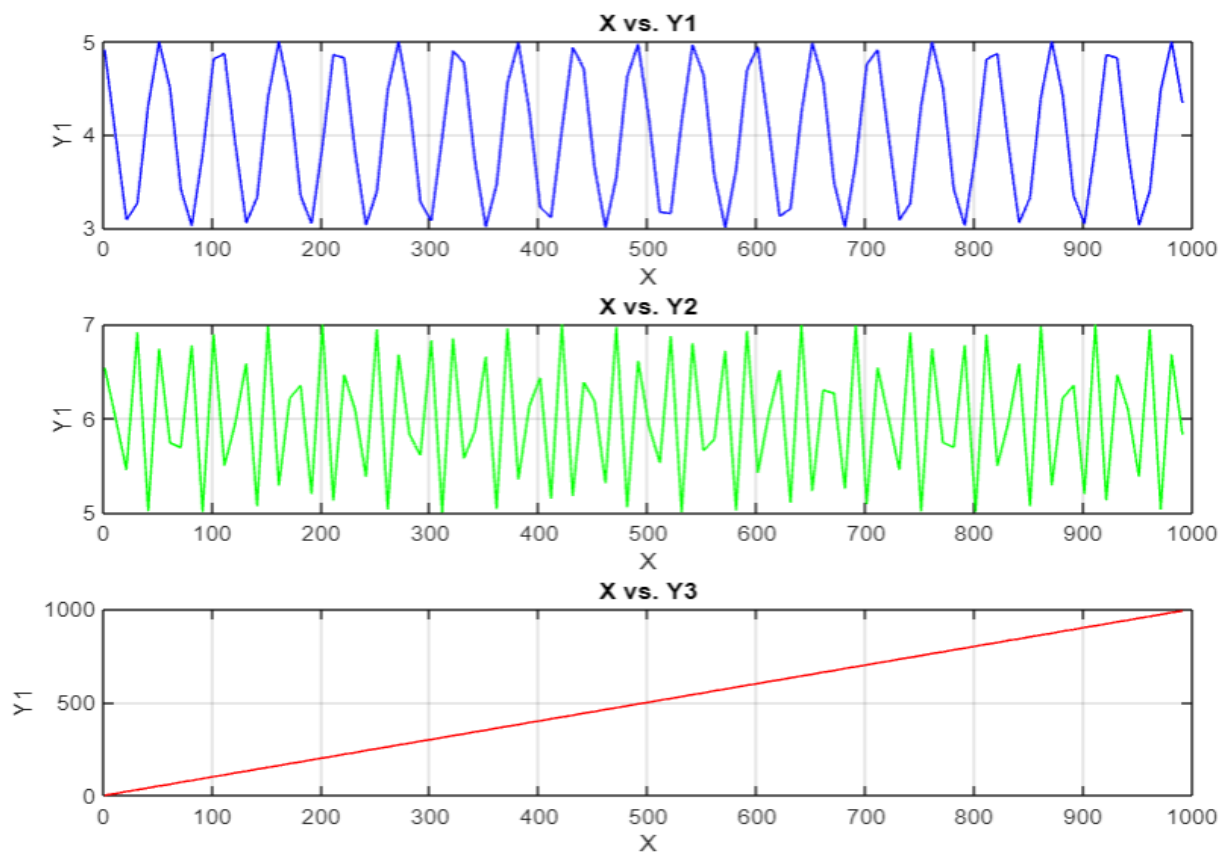
3D Plot:

```
x=[1:10:210];
y1=(sin(2*x)+4);
y2=cos(x)+6;
y3=sin(x)+x;
z=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0]
disp(x)
subplot(3,1,1)
plot3(x,y1,z,'y','LineWidth',2);
xlabel('X');
ylabel('Y1');
subplot(3,1,2)
plot3(x,y2,z,'g','LineWidth',2);
xlabel('X');
ylabel('Y2');
subplot(3,1,3)
plot3(x,y3,z,'r','LineWidth',1);
xlabel('X');
ylabel('Y3');
xlabel('X');
ylabel('Y1');
```

5.Draw 3D plots to analyse student performance based on lab and theory marks. Consider there are 10 students in the class and draw plots according to that.

PIE:

```
%student lab marks out of 20
lab=[20,16,13,19,20,20,16,15,18,18];
%student theory marks out of 100
theory=[80,79,56,78,80,57,49,78,67,77];
tot_marks=lab+theory;
student_roll=[1020,1021,1022,1023,1024,1025,1026,1027,1028,1029]
%student roll numbers
figure
explode=[1 1 1 1 1 1 1 1 1 1];
label={"1020","1021","1022","1023","1024","1025","1026","1027","1028","1029"};
pie3(lab,explode,label);
title('PIE CHART OF STUDENT LAB MARKS');
figure
```


PIE CHART OF STUDENT LAB MARKS
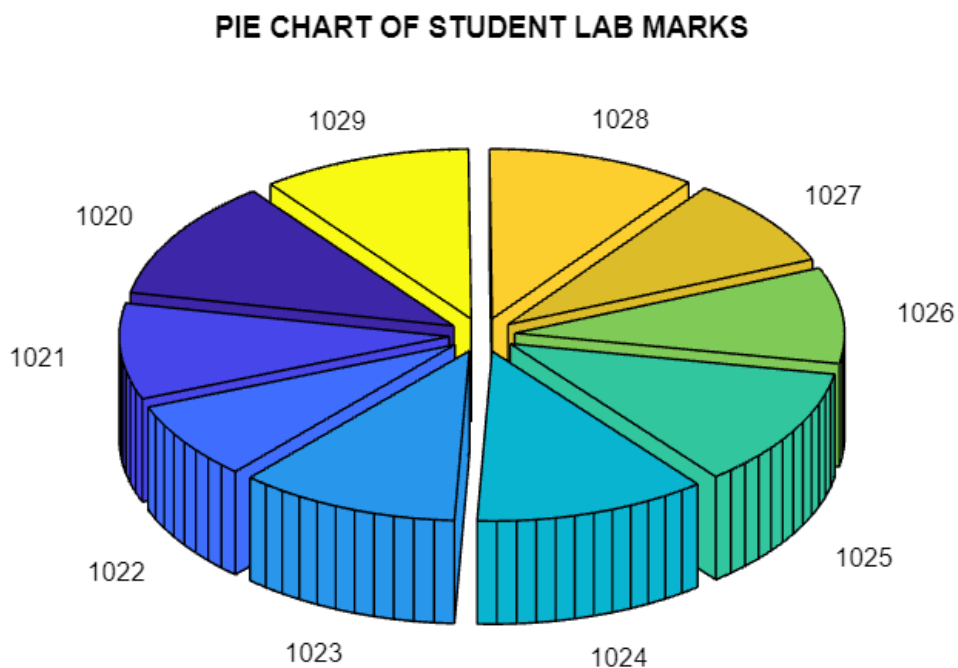
Bar:

```
bar3(student_roll,theory,'stacked')
xlabel('Student Roll number');
ylabel('Theory MARKS');
title('BAR PLOT FOR THEORY MARKS');
grid on
```

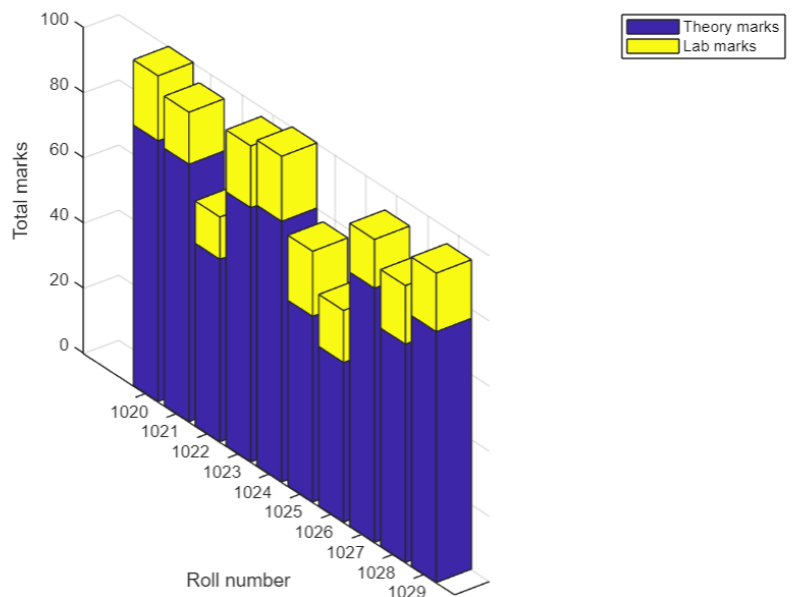BAR PLOT FOR THEORY MARKS
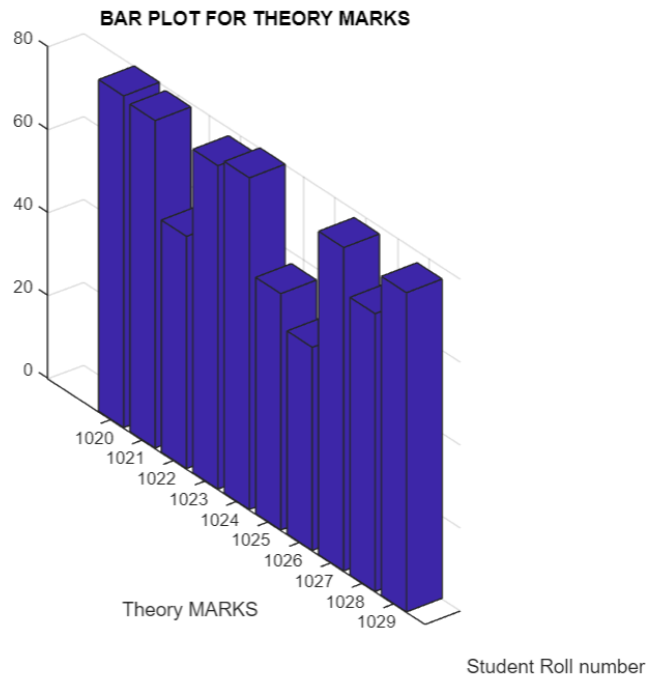
Bar 2:

```
lab=[20,16,13,19,20,20,16,15,18,18];
theory=[80,79,56,78,80,57,49,78,67,77];
tot_marks=lab+theory;
student_roll=[1020,1021,1022,1023,1024,1025,1026,1027,1028,1029]
marks = [theory' lab'];
bar3(student_roll, marks,
"stacked");
ylabel("Roll number");
zlabel("Total marks");
legend({"Theory marks", "Lab
marks"});
```

6. Draw 3D plots (bar-horizontal, bar-vertical) for employee details of an organization for performance appraisal. Consider the data as number of employees in a department, departments, worked hours, throughput.

```
department=[1,2,3,4,5];
employee=[40,65,56,78,80];
hold on
bar3(department(1),employee(1),'b');
bar3(department(2),employee(2),'c');
bar3(department(3),employee(3),'y');
bar3(department(4),employee(4),'r');
bar3(department(5),employee(5),'g');
legend({"Marketing", "Finance","Production","Engineering","H.R"});
ylabel('Departments');
zlabel('No. Of Employees');
title('Bar plot for no. of employees per department');
grid on
```

7. Draw 3D plots (bar-horizontal, bar-vertical) for employee details of a university for performance appraisal. Consider the data as number of employees in a department, departments, number of journals published, conferences, student's feedback, workshops conducted.

```
department=[1,2,3,4,5];%5 departments in the University
employee=[70,65,86,78,60];%No of employees per department
journal=[24,44,51,37,28];%No of journals published
conference=[16 39 44 54 6];
workshop=[12 56 75 23 56];
hold on
bar3(department(1),conference(1),'m');
bar3(department(2),conference(2),'c');
bar3(department(3),conference(3),'r');
bar3(department(4),conference(4),'y');
bar3(department(5),conference(5),'g');
legend({"AI", "Mechanical","CSE","Civil","BioTech"});
ylabel('Total Conferences');
zlabel('Departments');
title('Department vs. Conference');
grid on
```
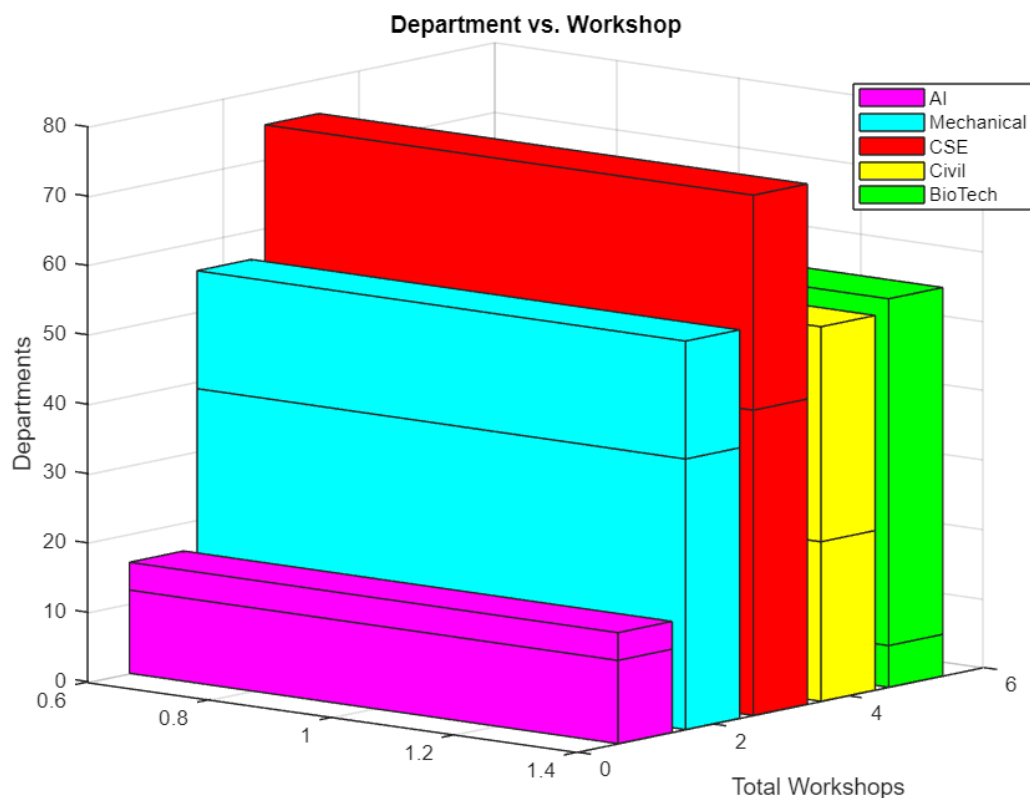
Horizontal bar:

```
department=[1,2,3,4,5];
employee=[40,65,56,78,80];
hold on
bar3h(department(1),employee(1),'m');
bar3h(department(2),employee(2),'c');
bar3h(department(3),employee(3),'r');
bar3h(department(4),employee(4),'y');
bar3h(department(5),employee(5),'g');
legend({"AI", "Mechanical","CSE","Civil","BioTech"});
ylabel('Total Hours worked');
zlabel('Departments');
title('Department vs. Employee');
grid on
```