

## LAB Experiments (Before MST) In SCILAB/MATLAB

### 1. Print Hello World

#### OUTPUT

```
--> disp("Hello World")
```

```
"Hello World"
```

### 2. Arithmetic Operations (Addition, Subtraction, Division, Multiplication)

### 3. Variable Assignment

#### CODE

```
a=3  
b=6  
c=a+b  
d=a-b  
e=a*b  
f=a/b  
disp([c,d,e,f])
```

#### OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q2&3.sce',  
-1)
```

```
9. -3. 18. 0.5
```

### 4. Square Root of a Number

#### CODE

```
a=49  
disp("Square root of a = " + string(sqrt(a)))  
a=81  
disp("Square root of a = " + string(sqrt(a)))
```

#### OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q4.sce', -1)
```

```
"Square root of a = 7"
```

"Square root of a = 9"

### 5. Area of a circle (Input Radius)

#### CODE

```
radius = input("Enter radius of circle : ")  
area = %pi * radius ^ 2  
disp("Area of circle = "+string(area))
```

#### OUTPUT

--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q5.sce', -1)

Enter radius of circle : 5

"Area of circle = 78.539816"

### 6. Greater of 2 numbers (Relational operators)

#### CODE

```
num1 = input("Enter first number : ")  
num2 = input("Enter second number : ")  
if(num1>num2)  
    disp("Greater of the two numbers is "+string(num1))  
elseif(num2>num1)  
    disp("Greater of the two numbers is "+string(num2))  
else  
    disp("Both the numbers sre equal")  
end
```

#### OUTPUT

--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q6.sce', -1)

Enter first number : 5

Enter second number : 8

"Greater of the two numbers is 8"

### 7. Logical AND, OR, NOT

#### CODE

```
temp = 40  
humidity = 14  
play = 0  
if(temp>35 & humidity>70)
```

```
disp("It is Sunny and Hot")
elseif(temp<30 | humidity<20)
disp("It is cool")
end
if(~play)
disp("PLAY!!!")
end
```

## OUTPUT

--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q7.sce', -1)

"It is cool"

"PLAY!!!"

## 8. Bitwise AND, OR, XOR, SHIFT

### CODE

```
num1_in_dec = 49
num2_in_dec = 93
disp("num1 in Decimal = "+string(num1_in_dec)+" num1 in Binary = "+dec2bin(num1_in_dec,8))
disp("num2 in Decimal = "+string(num2_in_dec)+" num2 in Binary = "+dec2bin(num2_in_dec,8))
disp("BITWISE OR")
disp(bitor(num1_in_dec,num2_in_dec),dec2bin(bitor(num1_in_dec,num2_in_dec)))
disp("BITWISE AND")
disp(bitand(num1_in_dec,num2_in_dec),dec2bin(bitand(num1_in_dec,num2_in_dec)))
disp("BITWISE XOR")
disp(bitxor(num1_in_dec,num2_in_dec),dec2bin(bitxor(num1_in_dec,num2_in_dec)))
```

## OUTPUT

--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q8.sce', -1)

"num1 in Decimal = 49 num1 in Binary = 00110001"

"num2 in Decimal = 93 num2 in Binary = 01011101"

"BITWISE OR"

125.

"1111101"

"BITWISE AND"

17.

"10001"

"BITWISE XOR"

108.

"1101100"

## 9. Set Operations

### CODE

```
a = [1, 2, 3, 4]
```

```
b = [3, 7, 6]
```

```
disp("a: ", a)
```

```
disp("b: ", b)
```

```
c = union(a, b)
```

```
disp("union of a and b: ", c)
```

```
d = intersect(a, b)
```

```
disp("intersection of a and b: ", d)
```

```
e = setdiff(a, b)
```

```
disp("Set Difference of a and b: ", e)
```

### OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q9.sce', -1)
```

"a: "

1. 2. 3. 4.

"b: "

3. 7. 6.

"union of a and b: "

1. 2. 3. 4. 6. 7.

"intersection of a and b: "

3.

"Set Difference of a and b: "

1. 2. 4.

**10.** WAP to check whether a number is odd or even

**CODE**

```
a= input("enter a number ")
if(modulo(a,2)==0) then
    disp("number is even ")
else
    disp("number is odd")
end
```

**OUTPUT**

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q10.sce',
-1)
enter a number 9
```

"number is odd"

**11.** Find greatest among 3 numbers

**CODE**

```
a = 10
b = 13
c = 7
if(a>b &a>c) then
    disp("a is greatest element")
elseif( a<b &b>c ) then
    disp("b is greatest element")
elseif( c>a&c>b ) then
    disp("c is greatest element")
end
```

**OUTPUT**

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q11.sce',
-1)
```

"b is greatest element"

**12.** Power Function

**CODE**

```
a = 5
disp(a^2)
disp(a**4)
disp(a^5)
```

**OUTPUT**

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q12.sce',
-1)
```

25.

625.

3125.

**13.** Find roots of a quadratic equation**CODE**

```
a=input("Enter coeffecient of x^2: ")
b=input("Enter coeffecient of x: ")
c=input("Enter constant: ")
p = poly([c b a], 'x', 'c')
disp(roots(p))
```

**OUTPUT**

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q13.sce',
-1)
```

Enter coeffecient of x^2: 1

Enter coeffecient of x: 3

Enter constant: 2

-2. + 0.i

-1. + 0.i

**14.** Nested function**CODE**

```
function y=foo(x)
    a=10*(x)
    function y=sq(x), y=x^2, endfunction
    y=sq(a)+1
```

```
endfunction
```

```
disp(foc(2))
```

## OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q14.sce',  
-1)
```

401.

**15.** Private Function

**16.** Global Variables

## CODE

```
global x  
x = 10
```

## OUTPUT

```
--> global x
```

```
--> x = 10
```

x =

10.

Variable Browser					
	Name	Value	Type	Visibility	Memory
<input type="checkbox"/>	a	1	Double	global	216 B
<input checked="" type="checkbox"/>	ans	1x1	Boolean	local	212 B
<input type="checkbox"/>	b	3	Double	local	216 B
<input type="checkbox"/>	c	2	Double	local	216 B
<input type="checkbox"/>	d	3	Double	local	216 B
<input type="checkbox"/>	e	[1, 2, 4]	Double	local	232 B
<input checked="" type="checkbox"/>	p	1x1	Polynomial	local	272 B
<input type="checkbox"/>	x	10	Double	global	216 B
<input type="checkbox"/>	y	401	Double	local	216 B

**17.** Strings

## CODE

```
a = "My new String"  
disp(a)
```

## OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q17.sce',  
-1)
```

"My new String"

## 18. Data Type Conversion

### CODE

```
disp("60 in decimal to binary(8 bits) : ",dec2bin(60,8))  
disp("00111100 in binary to decimal: ", bin2dec('00111100'))  
disp("22 in decimal to octal: ", dec2oct(20))  
disp("13 in decimal to hexadecimal: ", dec2hex(13))  
disp("15 in decimal to hexadecimal: ", dec2hex(15))  
disp("F in hexadecimal to decimal: ", hex2dec('F'))
```

## OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q18.sce',  
-1)
```

"60 in decimal to binary(8 bits) : "

"00111100"

"00111100 in binary to decimal: "

60.

"22 in decimal to octal: "

"24"

"13 in decimal to hexadecimal: "

"D"

"15 in decimal to hexadecimal: "

"F"



"F in hexadecimal to decimal: "

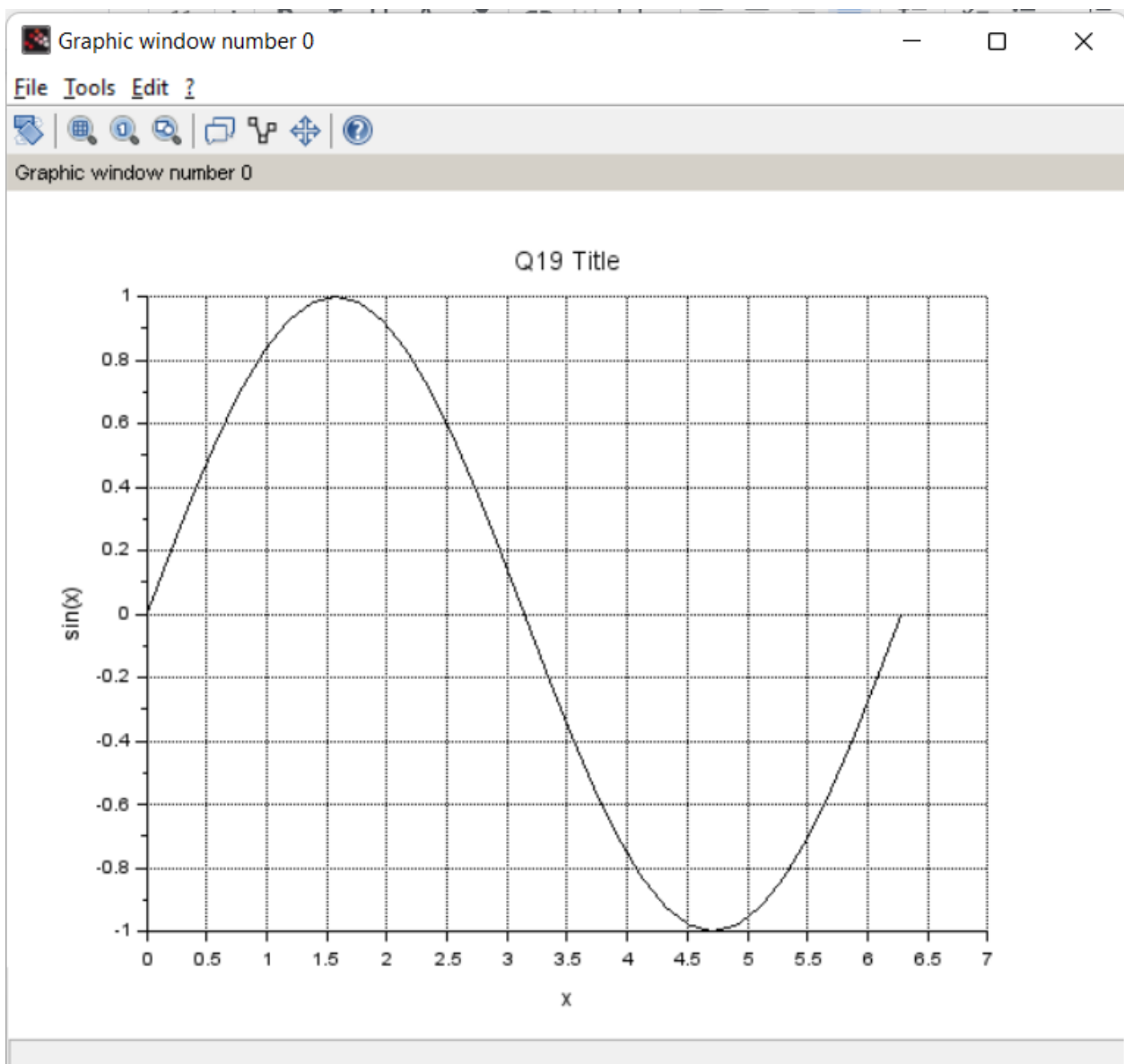
15.

### 19. Plot Graph with Title and Labels

#### CODE

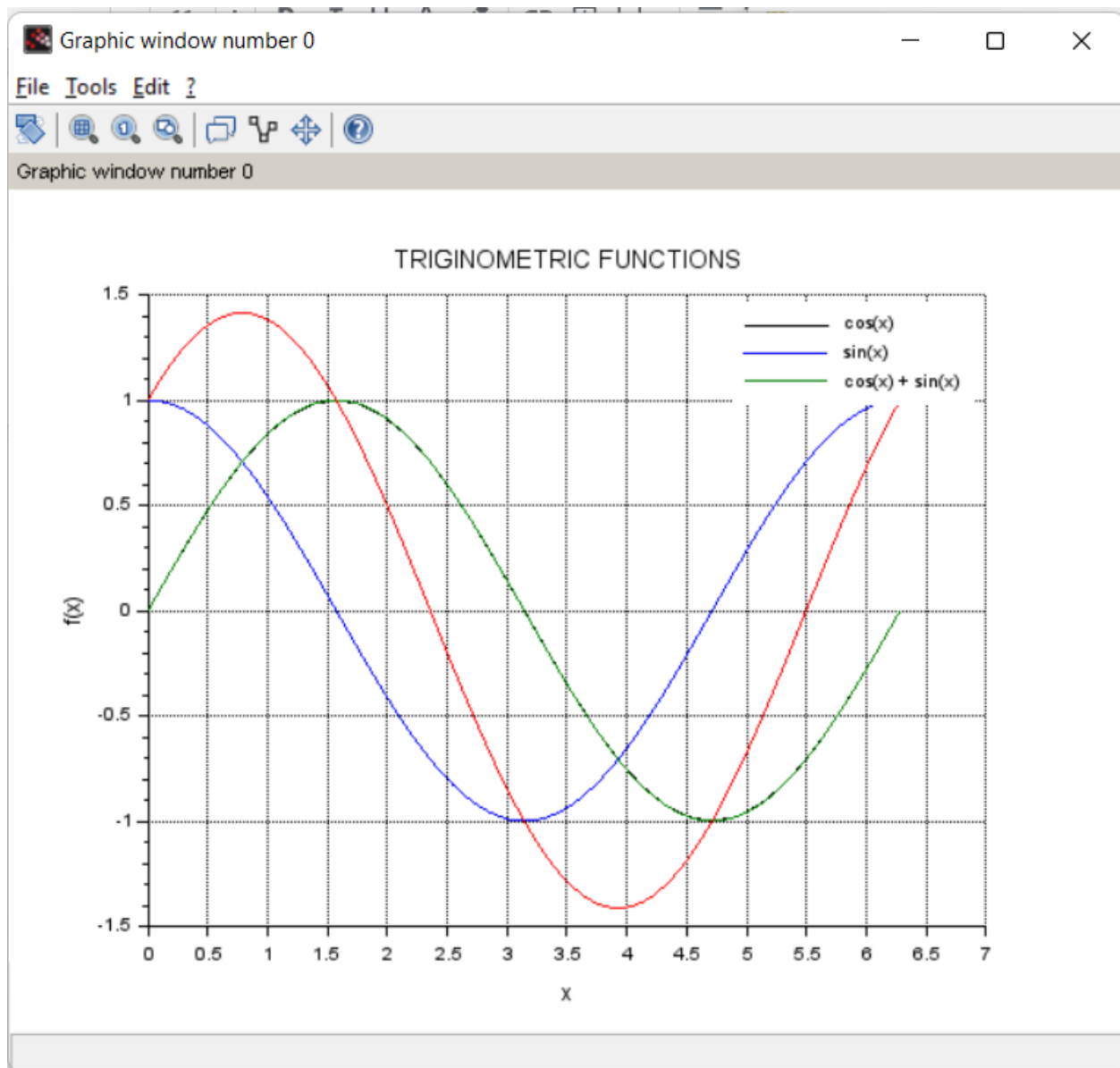
```
x=[0:%pi/16:2*%pi]
y = sin(x)
plot2d(x, y)
xgrid
xtitle('Q19 Title', 'x', 'sin(x)')
```

#### OUTPUT



**20.** Drawing multiple functions on the same graph**CODE**

```
x=[0:%pi/32:2*%pi];  
y=[cos(x) sin(x) cos(x)+sin(x)];  
plot(x, y); xgrid(1);  
xtitle('TRIGINOMETRIC FUNCTIONS', 'x', 'f(x)');  
legend('cos(x)', 'sin(x)', 'cos(x) + sin(x)', 1, %F);
```

**OUTPUT****21.** Subplots

**CODE**

```

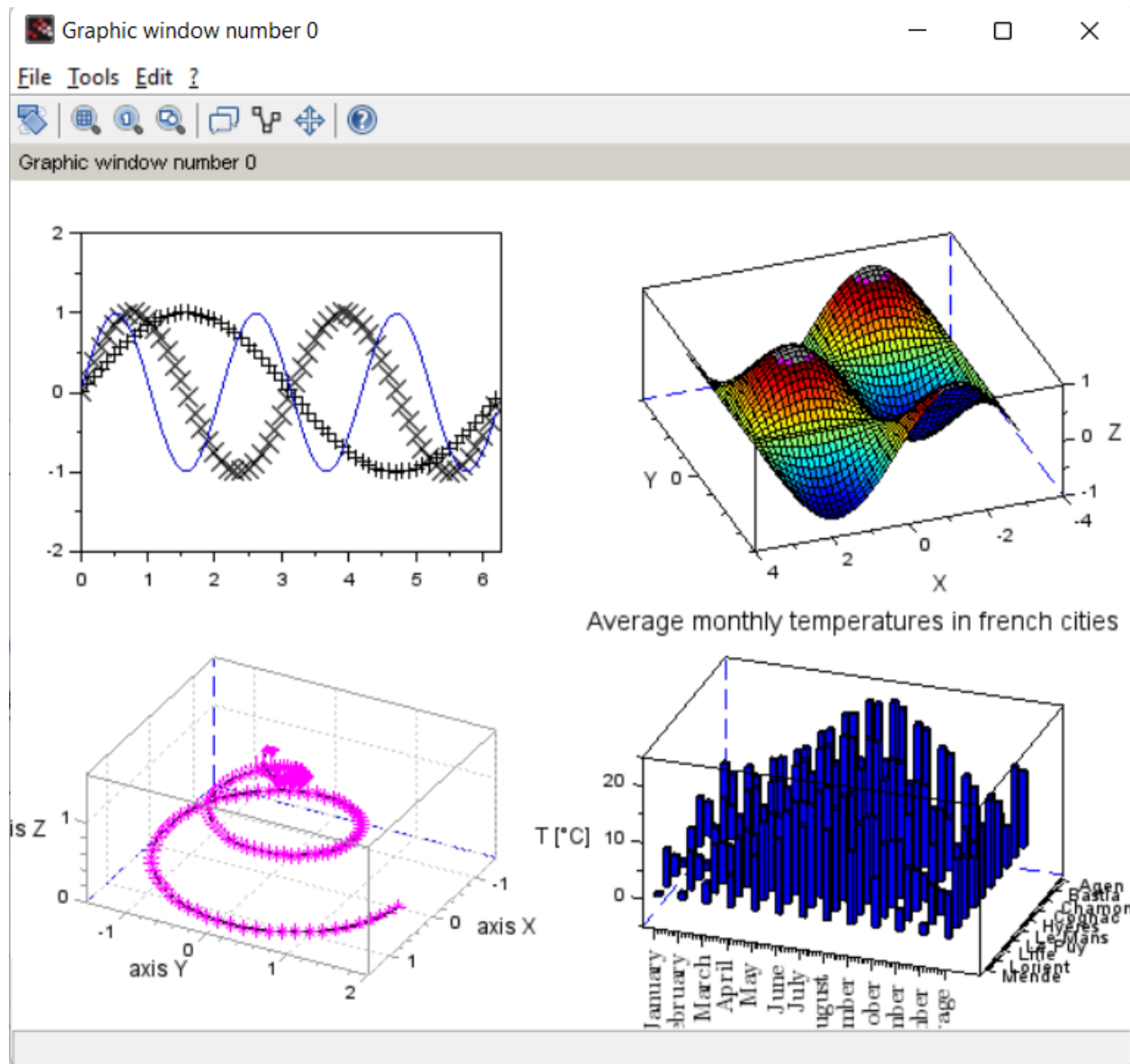
clf
subplot(2,2,1)
plot2d()

subplot(2,2,2)
plot3d()

subplot(2,2,3)
param3d()

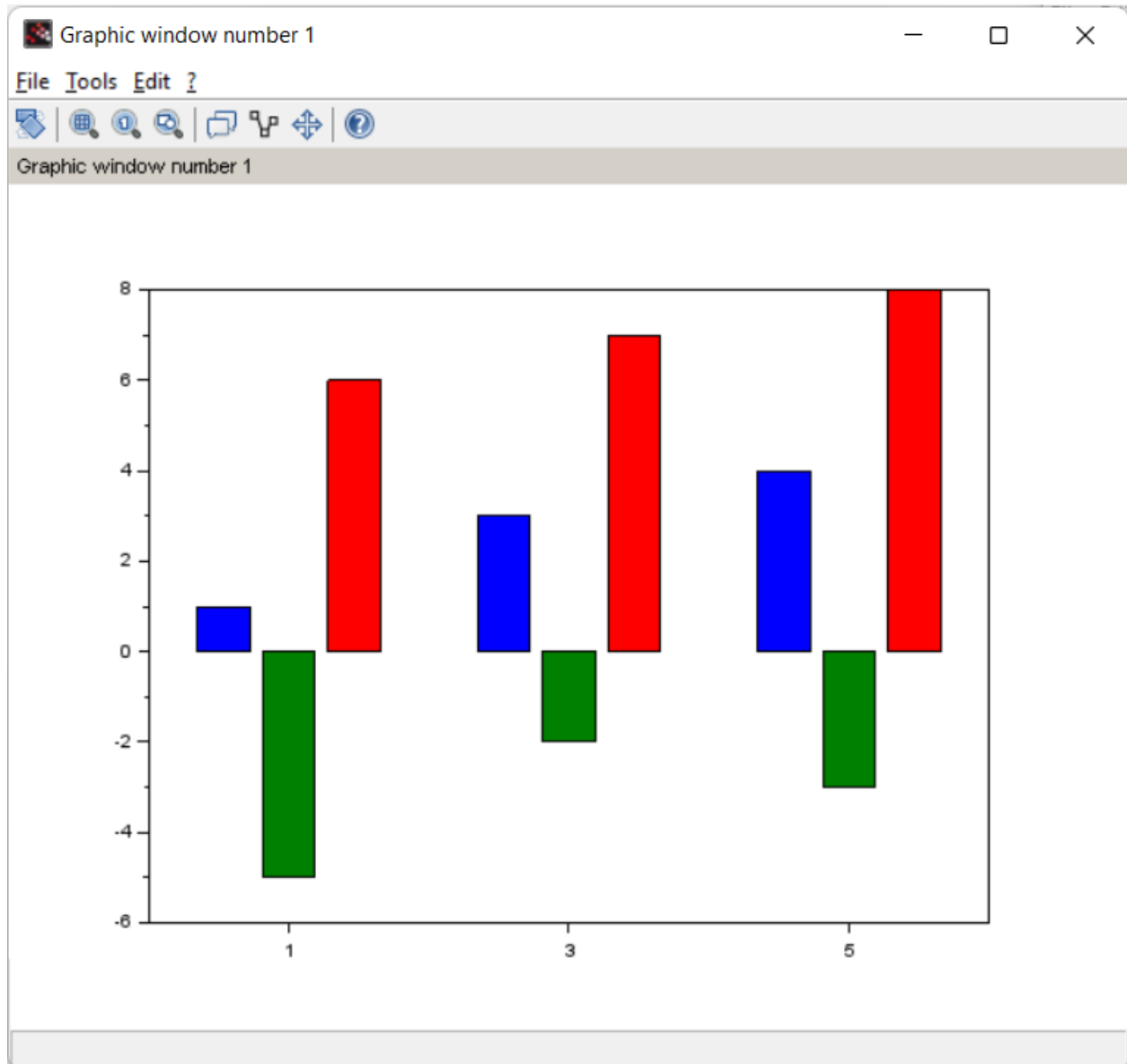
subplot(2,2,4)
bar3d()

```

**OUTPUT**

**22. Bar charts****CODE**

```
scf(1);  
x=[1 3 5];  
y=[1 -5 6;3 -2 7;4 -3 8];  
bar(x,y);
```

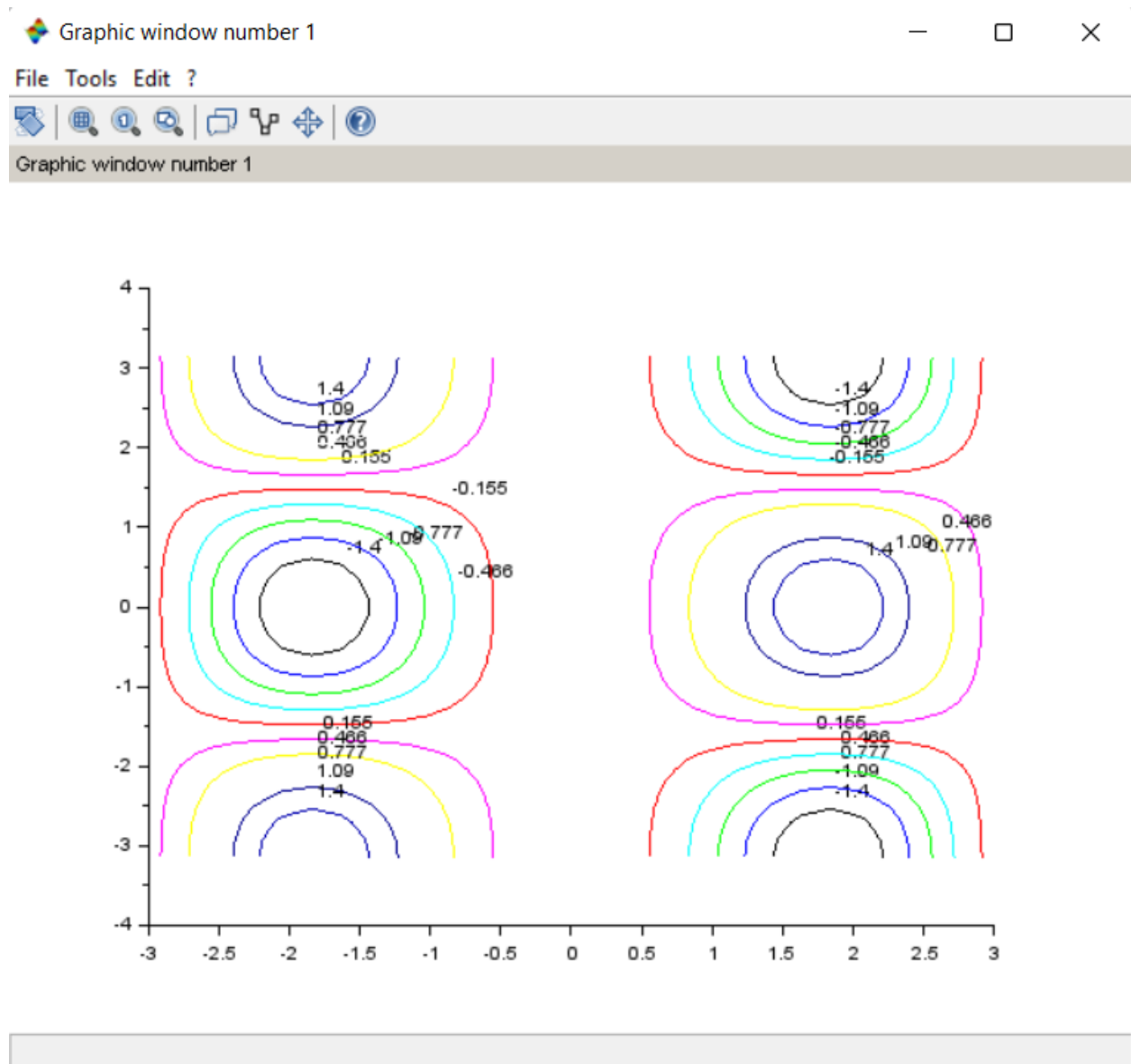
**OUTPUT****23. Contours****CODE**

```

clf
t=linspace(-%pi,%pi,30);
function z=my_surface(x,y),z=x*sin(x)^2*cos(y),endfunction
contour(t,t,my_surface,10)

```

## OUTPUT



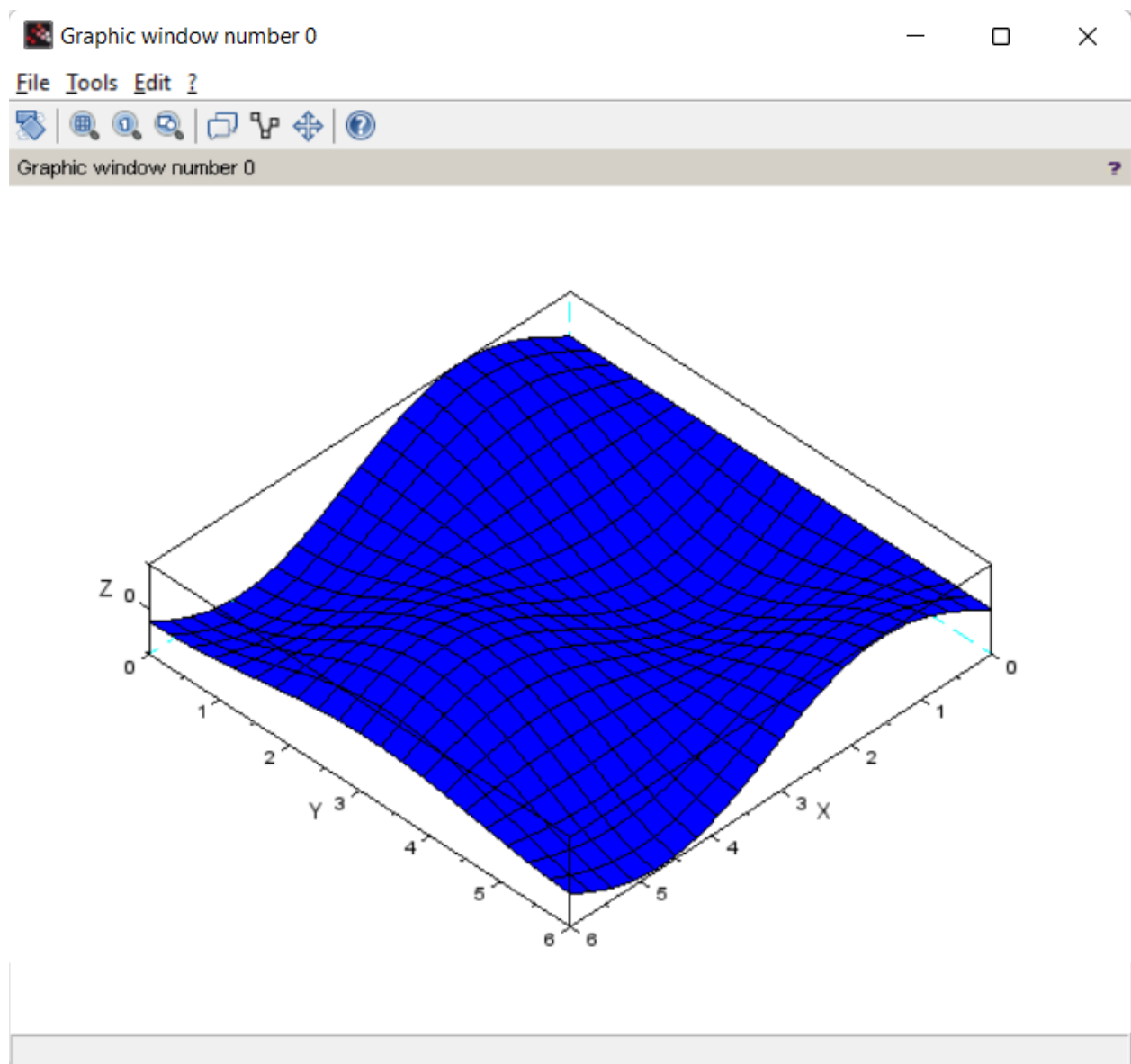
## 24. Three dimensional Plot

### CODE

```

clf;
t=[0:0.3:2*%pi]';
z=sin(t)*cos(t');
plot3d(t,t,z);

```

**OUTPUT****25. Arrays****CODE**

```
a = [1 2 3]
b = [4 5 6]
disp("a: ", a)
disp("b: ", b)

c = a + b
disp("a+b: ", c)

d = a.*b
disp("a.*b: ", d)
```

**OUTPUT**

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q25.sce',  
-1)
```

"a: "

1. 2. 3.

"b: "

4. 5. 6.

"a+b: "

5. 7. 9.

"a.\*b: "

4. 10. 18.

**26. Matrices****CODE**

```
a=[1,2,3;4,5,6;7,8,9]  
b=[10,11,12;13,14,15;16,17,18]  
disp("a: ", a)  
disp("b: ", b)  
  
c = a+b  
disp("c: ", c)  
  
d = a*b  
disp("d: ", d)
```

**OUTPUT**

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q26.sce',  
-1)
```

"a: "

1. 2. 3.

4. 5. 6.

7. 8. 9.

"b: "

10. 11. 12.  
13. 14. 15.  
16. 17. 18.

"c: "

11. 13. 15.  
17. 19. 21.  
23. 25. 27.

"d: "

84. 90. 96.  
201. 216. 231.  
318. 342. 366.

## 27. Generate Random Numbers

### CODE

```
A=100*rand(20,1); //Generates a vector with 20 random floating integers in range [0,100]
disp(A)
B=round(100*rand(20,1)); //Generates a vector with 20 random integers in range [0,100]
disp(B)
C=round(100*rand(5,5)); //Generates a matrix of size 5x5 with 5x5=25 random integers in range [0,100]
disp(C)
```

### OUTPUT

```
--> exec('C:\Users\kulpr\Downloads\Sem 7\Simulation and Modelling\Lab questions\Q27.sce',
-1)
```

21.132487  
75.604385  
0.0221135  
33.032709  
66.538110  
62.839179  
84.974524  
68.573102  
87.821648  
6.8374037  
56.084861



66.235694  
72.635068  
19.851438  
54.425732  
23.207479  
23.122372  
21.646326  
88.338878  
65.251349

31.  
93.  
21.  
31.  
36.  
29.  
57.  
48.  
33.  
59.  
50.  
44.  
27.  
63.  
41.  
92.  
4.  
48.  
26.  
41.

28. 69. 41. 59. 39.  
13. 15. 88. 69. 92.  
78. 70. 11. 89. 95.  
21. 84. 20. 50. 34.  
11. 41. 56. 35. 38.