Vasile Stefania Elena 422D

Tema Laborator 1 Proiect

1. Numele implicit al rezultatului în workspace și command prompt
   ans

   >> x = 3 + 4
   x = 7
   >> ans = x
   ans = 7

2. pi
   >> pi
   ans = 3.1416

3. Inf
   >> inf
   ans = Inf

4. NaN
   >> NaN
   ans = NaN

5. +, -, *, /, ^,
   >> 2+13
   ans = 15
   >> 7-4
   ans = 3
   >> 3*7
   ans = 21
   >> 8/2
   ans = 4
   >> 2^6
   ans = 64

6. <, <=, >, >=, ==, ~=
   >> 4<5
   ans = 1
   >> 4<3
   ans = 0

7. &, | , ~
   >> 1&0
   ans = 0

```
>> 1&1
ans = 1
>> 1|0
ans = 1
>> 0|0
ans = 0
>> ~0
ans = 1
>> ~1
ans = 0
```

8. I,j

```
>> i
ans =  0 + 1i
>> j
ans =  0 + 1i
```

9. abs(z), angle(z)

```
>> z = 5 + 10i
z =   5 + 10i
>> abs(z)
ans = 11.180
>> angle(z)
ans = 1.1071
```

10. acos(x), asin(x), atan(x)

```
>> x = pi/4
x = 0.7854
>> acos(x)
ans = 0.6675
>> asin(x)
ans = 0.9033
>> atan(x)
ans = 0.6658
```

11. acosh(x), asinh(x), atang(x)

```
>> x = pi/3
x = 1.0472
>> acosh(x)
ans = 0.3060
>> asinh(x)
ans = 0.9144
>> atan(x)
ans = 0.8084
```

12. cos(x), sin(x),tan(x)

```
>> x = pi/3
x = 1.0472
>> cos(x)
ans = 0.5000
>> sin(x)
ans = 0.8660
>> tan(x)
ans = 1.7321
```

13. cosh(x), sinh(x), tanh(x)

```
>> x = pi/3
x = 1.0472
>> cosh(x)
ans = 1.6003
>> sinh(x)
ans = 1.2494
>> tanh(x)
ans = 0.7807
```

14. conj(z), imag(z), real(z)

```
>> z = 1+i
z =  1 + 1i
>> conj(z)
ans =  1 - 1i
>> imag(z)
ans = 1
>> real(z)
ans = 1
```

15. exp(x), log(x), log10(x)

```
>> exp(2)
ans = 7.3891
>> e^2
ans = 7.3891

>> log(e^2)
ans = 2

>> log10(100)
ans = 2
>> log10(1000)
```

ans = 3

16. ceil(x), floor(x)

```
>> x = 5.7
x = 5.7000
>> ceil(x)
ans = 6
>> floor(x)
ans = 5
```

17. fix(x), round(x)

```
>> x = 2.8
x = 2.8000
>> fix(x)
ans = 2
>> round(x)
ans = 3
```

18. A*B, A./B

```
>> A = [2,1,3;-2,2,1]
A =

   2   1   3
  -2   2   1

>> B = [2,1;3,2;-2,2]
B =

   2   1
   3   2
  -2   2

>> A*B
ans =

    1   10
    0    4
```

Sau:

```
>> A = [2,4,6,8]
A =

   2   4   6   8

>> B=[2,2,2,2]
```

```
B =

  2   2   2   2
>> A./B
ans =

  1   2   3   4
```

19. **A**.^**B**

```
>> A = [2,4,6,8]
A =

  2   4   6   8

>> B=[2,2,2,2]
B =

  2   2   2   2

>> A.^B
ans =

   4   16   36   64
```

20. x', A'

```
>> A = [2,1,3;-2,2,1]
A =

  2   1   3
 -2   2   1

>> A'
ans =

  2  -2
  1   2
  3   1

>> a = [2,4,6,8]
a =

  2   4   6   8

>> a'
```

```
ans =

  2
  4
  6
  8
```

21. x.', A.'

```
>> A = [2,3;-2,1]
A =

  2   3
 -2   1

>> A.'
ans =

  2  -2
  3   1
```

22. **x**=valoare_initial:valoare_pas:valoare_final

```
>> h = 1:3:20
h =

   1   4   7  10  13  16  19
```

23. **x**=linspace(valoare_inițial, valoare_final, n)

```
>> linspace(1,10,5)
ans =

   1.0000    3.2500    5.5000    7.7500   10.0000
```

24. A=[x1 ;x2]

```
>> x1 = [1,2,3]
x1 =

  1   2   3

>> x2 = [4,5,6]
x2 =

  4   5   6

>> A=[x1;x2]
```

A =

1 2 3
4 5 6

25. ones(N,M), zeros(N,M), eye(N,M)
>> ones(2,3)
ans =

1 1 1
1 1 1

>> zeros(2,3)
ans =

0 0 0
0 0 0

>> eye(3,3)
ans =

Diagonal Matrix

1 0 0
0 1 0
0 0 1

26. A(i,j)
>> A = [2,1,3;-2,2,1;6,7,8]
A =

2 1 3
-2 2 1
6 7 8

>> A(2,3)
ans = 1

27. A(I,:), A(i:j,:), **A**(i:k:j,:), **A**([i,j,k],:), **A**(:,j), **A**(:,i:j), **A**(:,i:k:j), **A**(:,[i,j,k])
>> A = [2,1,3;-2,2,1;6,7,8]
A =

```
   2   1   3
  -2   2   1
   6   7   8

>> A(2,:)
ans =

  -2   2   1

>> A(2:3,:)
ans =

  -2   2   1
   6   7   8

>> A(1:1:2,:)
ans =

   2   1   3
  -2   2   1

>> A([1,2,3],:)
ans =

   2   1   3
  -2   2   1
   6   7   8

>> A(:,2)
ans =

   1
   2
   7

>> A(:,2:3)
ans =

   1   3
   2   1
   7   8
```

28. who

    >> who

    Variables visible from the current scope:

    A B a ans h i x x1 x2 z

29. size(A)

    >> A = [2,1,3;-2,2,1;6,7,8]

    A =

      2 1 3
     -2 2 1
      6 7 8

    >> size(A)

    ans =

      3 3

30. length(x)

    >> x = [1,2,3,4,5]

    x =

      1 2 3 4 5

    >> length(x)

    ans = 5

31. Bucla for

    for i=val_initiala:pas:val_finala

        Instructiuni

            End

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testtt.m

```
function retval = testtt ()


  for i = 1:5,
    disp(i);
  end;
endfunction
```

```
>> testtt.m
1
2
3
4
5
```

32. Secvență de cauzalitate if/ else/elseif

if conditie

instructiuni

else/elseif

instructiuni

end

testtt.m

```
function retval = testtt ()
  variable1 = 20;
  variable2 = 40;

  if variable1 == variable2,
    disp('The variables are Equal');
  else
    disp('The variables are Not Equal');
  end;
endfunction
```

```
>> testtt.m
The variables are Not Equal
```

33. Bucla while

While (conditie)

Instructiuni

end

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testtt.m

```
function retval = testtt ()
  i = 1;

  while i <= 10
    disp(i);
    i = i + 1;
  endwhile
endfunction
```

```
>> testtt.m
1
2
3
4
5
6
7
8
9
10
```

34. Pause, pause(n)

testtt.m

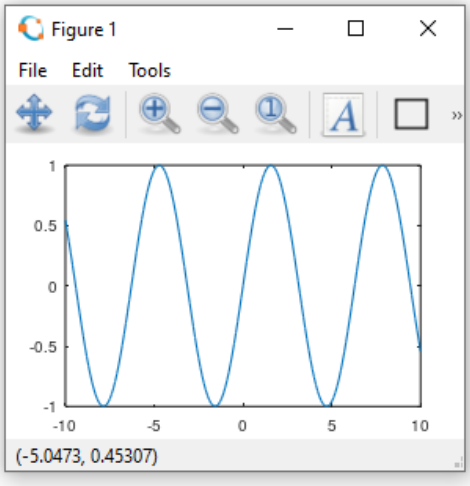
```
function retval = testtt ()
  i = 1;

  while i <= 10
    disp(i);
    pause(2);
    i = i + 1;
  endwhile
endfunction
```

```
>> testtt.m
1
2
```

35. plot(x,y), stem(x,y)

testtt.m

```
function retval = testtt ()
  x = -10:0.1:10;
  plot (x, sin (x));
endfunction
```



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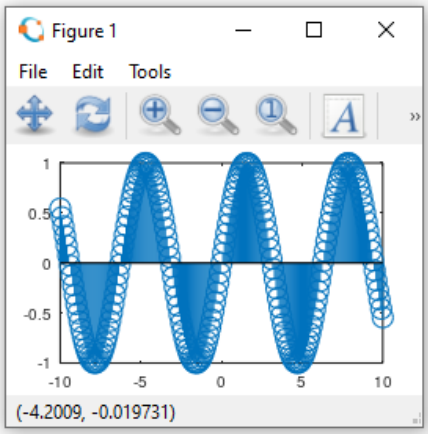
testtt.m

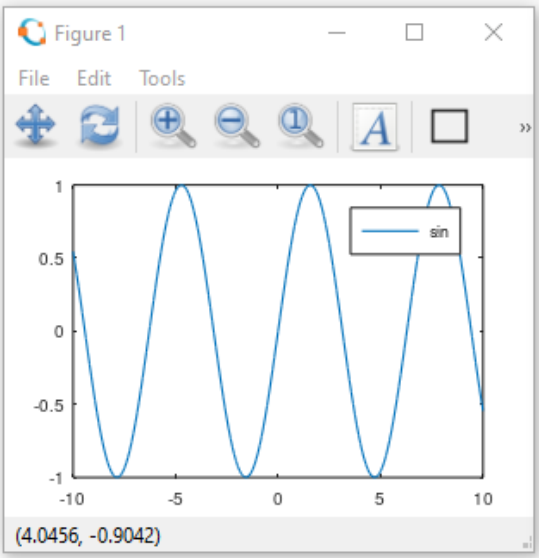
```
1  function retval = testtt ()
2    x = -10:0.1:10;
3    stem (x, sin (x));
4  endfunction
5
```

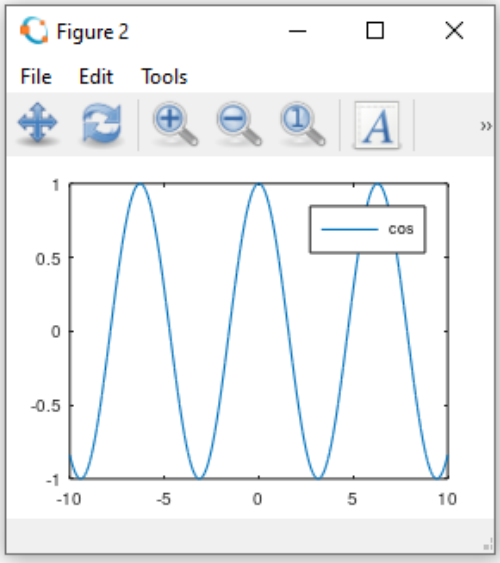


36. figure

testtt.m

```
1  function retval = testtt ()
2    figure (1);
3    fplot (@sin, [-10, 10]);
4    figure (2);
5    fplot (@cos, [-10, 10]);
6  endfunction
7
```

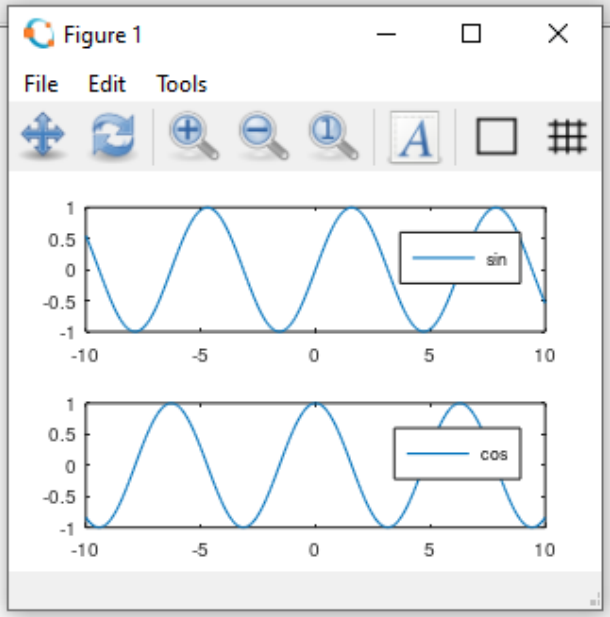




37. Subplot

testtt.m

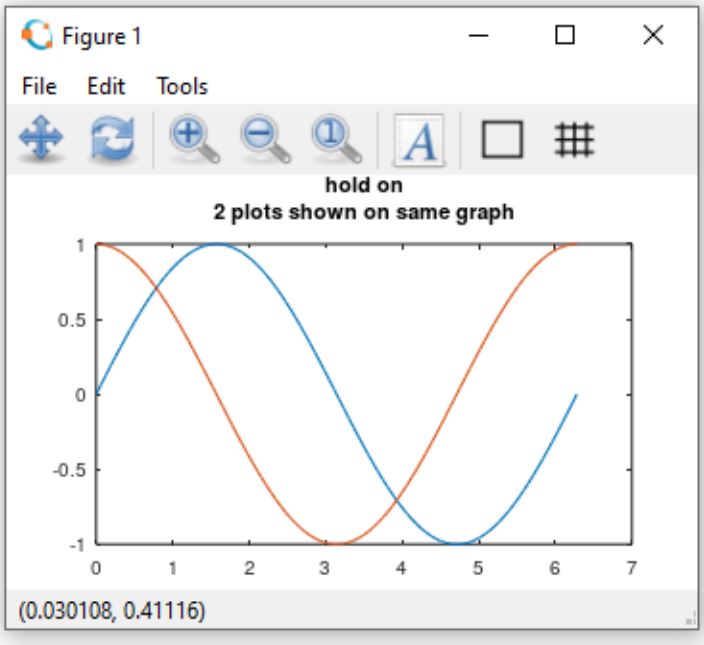
```
function retval = testtt ()
    subplot (2, 1, 1)
    fplot (@sin, [-10, 10]);
    subplot (2, 1, 2)
    fplot (@cos, [-10, 10]);
endfunction
```



38. hold on, hold off

testtt.m

```
function retval = testtt ()
    t = linspace (0, 2*pi, 100);
    plot (t, sin (t));
    hold on;
    plot (t, cos (t));
    title ({"hold on", "2 plots shown on same graph"});
    hold off;
endfunction
```



39. axis ([x_inf x_sup y_inf y_sup])

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testtt.m

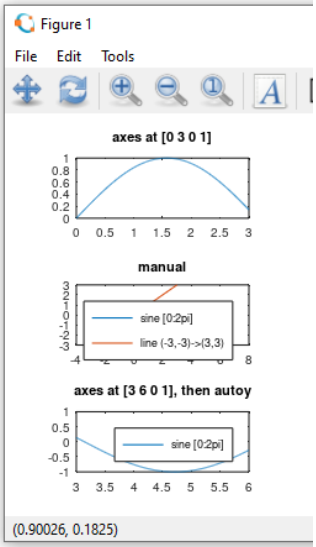
```
function retval = testtt ()
   t = 0:0.01:2*pi;
   x = sin (t);

 subplot (321);
  plot (t, x);
  title ("axes at [0 3 0 1]");
  axis ([0,3,0,1]);

 subplot (323);
  plot (t, x, ";sine [0:2pi];"); hold on;
  plot (-3:3,-3:3, ";line (-3,-3)->(3,3);");
  title ("manual");
  axis ("manual");

 subplot (325);
  plot (t, x, ";sine [0:2pi];");
  title ("axes at [3 6 0 1], then autoy");
  axis ([3,6,0,1]);
  axis ("autoy");

endfunction
```



40. Titlurile axelor, titlul figurii, legenda figurii

xlabel(´nume_axa_OX´),

ylabel(nume_axa_OY),

title(nume_figura),

legend (parametrii)

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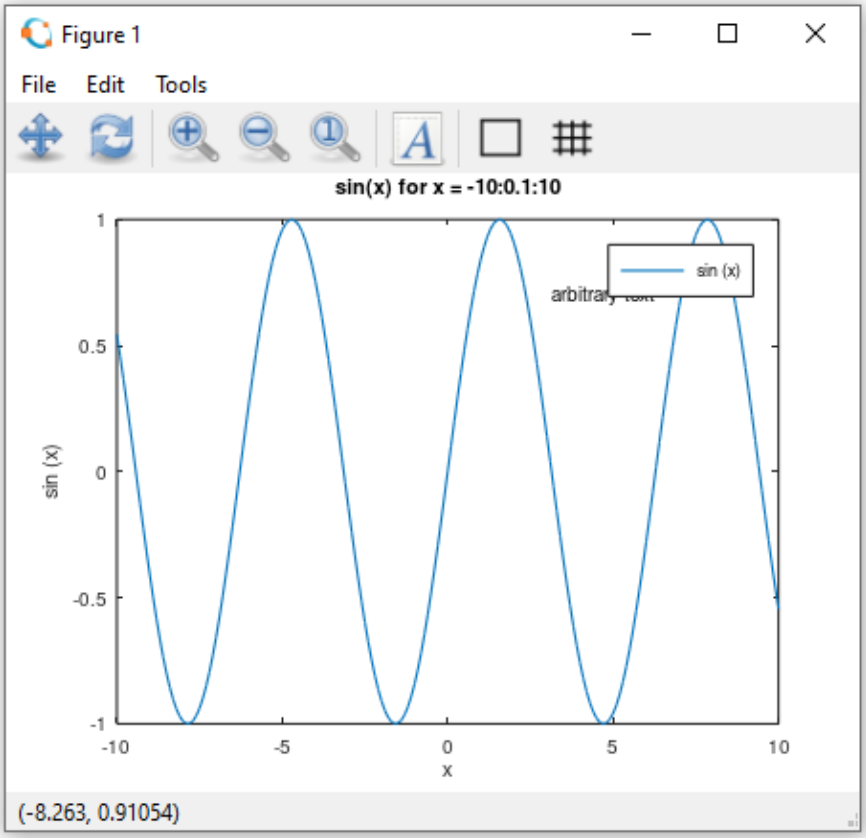
testtt.m

```
function retval = testtt ()
    x = -10:0.1:10;
    plot (x, sin (x));
    title ("sin(x) for x = -10:0.1:10");
    xlabel ("x");
    ylabel ("sin (x)");
    text (pi, 0.7, "arbitrary text");
    legend ("sin (x)");
endfunction
```



41. save, load

```
>> save testtt.m
```

42. help nume_functie

```
>> help pwd
'pwd' is a built-in function from the file libinterp/corefcn/dirfns.cc

 -- pwd ()
 -- DIR = pwd ()
     Return the current working directory.

     See also: cd, dir, ls, mkdir, rmdir.

Additional help for built-in functions and operators is
available in the online version of the manual.  Use the command
'doc <topic>' to search the manual index.

Help and information about Octave is also available on the WWW
at https://www.octave.org and via the help@octave.org
mailing list.
>>
```

43. clear, clf

```
>> clear
>> who
>>
```

44. cd, pwd

```
>> pwd
ans = C:\Users
```

45. input("introduceti de la tastatura>>")

```
>> input("3")
3
```

Tema 1.2 : Scrieți un program care să genereze pentru 2 secunde o nota muzicală la alegere. Salvați comenzile într-un fișier denumit Nume_Prenume_Grupa_T1.2.

```
function retval = testtt ()
   Fs=8000;
   Ts=1/Fs;
   t=[0:Ts:2];
   F_A=440; %Frecventa notei este 440 Hz
   A=sin(2*pi*F_A*t);
   sound(A,Fs);
endfunction
```

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Tema 1.3

Scrieți un program Matlab/Octave în care să calculați integrala[1] funcției $x^2(t)$, unde:

$$x(t) = \frac{sin(t)}{t}$$

Salvați comenzile într-un fișier denumit Nume_Prenume_Grupa_T1.3.

```
function F = testtt ()
    syms x
    expr = (sin(x)/x)^2;
    F = int(expr)
endfunction
```

```
>> testtt.m
F = (sym)

              cos(2*x)     1
  Si(2*x) + -------- - ---
               2*x       2*x
```

testtt.m

```
1  function F = testtt ()
2      syms x
3      expr = (sin(x)/x)^2;
4      F = int(expr)
5  endfunction
6
```