

Solution of Laboratory Work 4

Exercise 1:

```
--> function y = f(x)
>     if x >= 0 then
>         y = exp(-x);
>     else
>         y = 0;
>     end
> endfunction
```

```
--> f(3.4)
```

```
ans =
    0.0333733
```

```
--> f(-0.1)
```

```
ans =
    0.
```

Exercise 2:

```
--> function y = f(x)
>     if x >= -1 & x <= 0 then
>         y = x + 1;
>     elseif x > 0 & x <= 1 then
>         y = -x + 1;
>     else
>         y = 0;
>     end
> endfunction
```

```
--> f(-0.5)
ans =
    0.5
--> f(0.8)
ans =
    0.2000000
--> f(7)
ans =
    0.
```

Exercise 3:

```
--> function [f]=fact(n)
    > if n <= 1 then
    > f = 1
    > else
    > f = n*fact(n-1)
    > end
    > endfunction

--> fact(5)
ans =
    120.
```

Exercise 4:

```
--> function [u]=fib(n)
    > // calcul du n ieme terme
    > // de la suite de Fibonnaci :
    > // fib(0) = 1, fib(1) = 1,
    > // fib(n+2) = fib(n+1) + fib(n)
    > if n <= 1 then
```

```
> u = 1
> else
> u = fib(n-1) + fib(n-2)
> end
> endfunction

--> fib(7)
ans =
    21.
```

Exercise 5:

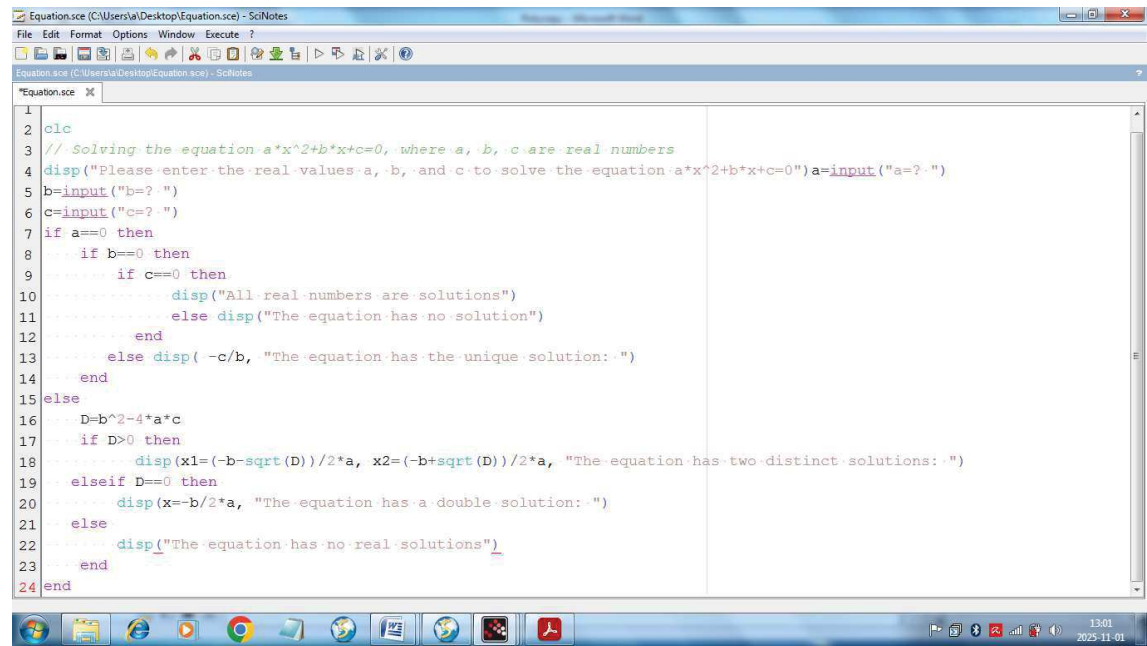
```
--> function C = binomial(n, k)
> //Calculates the binomial coefficient C(n, k)
>     if k == 0 | k == n then
>         C = 1;
>     else
>         C = (n / k) * binomial(n - 1, k - 1);
>     end
> endfunction

--> binomial(10, 7)

ans =

    120.
```

Exercise 6:



```
1 clc
2 // Solving the equation a*x^2+b*x+c=0, where a, b, c are real numbers
3 disp("Please enter the real values a, b, and c to solve the equation a*x^2+b*x+c=0") a=input("a=? ")
4 b=input("b=? ")
5 c=input("c=? ")
6 if a==0 then
7     if b==0 then
8         if c==0 then
9             disp("All real numbers are solutions")
10        else disp("The equation has no solution")
11    end
12 else disp(-c/b, "The equation has the unique solution: ")
13 end
14 else
15     D=b^2-4*a*c
16     if D>0 then
17         disp(x1=(-b-sqrt(D))/2*a, x2=(-b+sqrt(D))/2*a, "The equation has two distinct solutions: ")
18     elseif D==0 then
19         disp(x=-b/2*a, "The equation has a double solution: ")
20     else
21         disp("The equation has no real solutions")
22     end
23 end
24 end
```

```
Clc
// Solving the equation a*x^2+b*x+c=0, where a,
// b and c are real numbers
disp("Please enter the real values a, b, and c to
solve the equation a*x^2+b*x+c=0 : ")
a=input("a=? ")
b=input("b=? ")
c=input("c=? ")
if a==0 then
    if b==0 then
        if c==0 then
            disp("All real numbers are solutions")
        else disp("The equation has no solution")
        end
    else disp( "The equation has the unique
solution: ", -c/b)
    end
else
```

```
D=b^2-4*a*c
if D>0 then
    disp("The equation has two distinct solutions:",
    x1=(-b-sqrt(D))/2*a, x2=-b+sqrt(D))/2*a)
elseif D==0 then
    disp("The equation has a double solution: ",
x=-b/2*a)
else
    disp("The equation has no real solutions")
end
end
```