3. Write a program in a script file that determines the real roots of a quadratic equation ax2 + bx + c = 0. Name the file quadroots. When the file runs, it asks the user to enter the values of the constants a, b, and c. To calculate the roots of the equation the program calculates the discriminant D, given by: If D > 0, the program displays message “The equation has two roots,” and the roots are displayed in the next line.

If D = 0, the program displays message “The equation has one root,” and the root is displayed in the next line.

If D < 0, the program displays message “The equation has no real roots.” Run the script file in the Command Window three times to obtain solutions to the following three equations:

a) 3x2 + 6x + 3 = 0 b) – 3x2 + 4x – 6 = 0 c) – 3x2 + 7x + 5 = 0

**Problem 3**

Script file:

clear, clc

for k=1:3

disp('For the equation ax^2+bx+c')

a=input('Enter a: ');

b=input('Enter b: ');

c=input('Enter c: ');

D=b^2-4\*a\*c;

if D<0

fprintf('\nThe equation has no real roots.\n\n')

elseif D==0

root=-b/(2\*a);

fprintf('\nThe equation has one root,\n')

fprintf(' %.3f\n\n',root)

else

r1=(-b+sqrt(D))/(2\*a);

r2=(-b-sqrt(D))/(2\*a);

fprintf('\nThe equation has two roots,\n')

fprintf(' %.3f and %.3f\n\n',r1,r2)

end

end

Command Window:

For the equation ax^2+bx+c

Enter a: 3

Enter b: 6

Enter c: 3

The equation has one root,

-1.000

For the equation ax^2+bx+c

Enter a: -3

Enter b: 4

Enter c: -6

The equation has no real roots.

For the equation ax^2+bx+c

Enter a: -3

Enter b: 7

Enter c: 5

The equation has two roots,

-0.573 and 2.907

4. Fibonacci numbers are the numbers in a sequence in which the first two elements are 0 and 1, and the value of each subsequent element is the sum of the previous two elements: 0, 1, 1, 2, 3, 5, 8, 13, ...

Write a MATLAB program in a script file that determines and displays the first 20 Fibonacci numbers.

**Problem 4**

Script file:

clear, clc

f(1)=0; f(2)=1;

for k=1:18

f(k+2)=f(k)+f(k+1);

end

fprintf('The first 20 Fibonacci numbers are:\n')

fprintf(' %i',f)

fprintf('\n')

Command Window:

The first 20 Fibonacci numbers are:

0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181