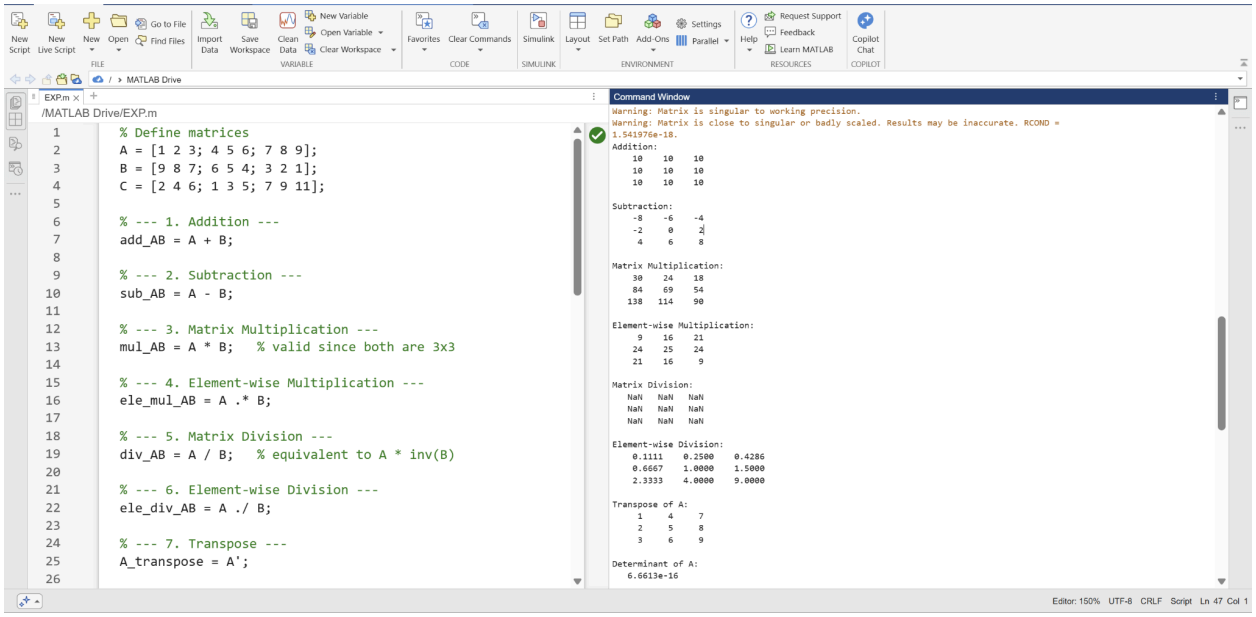
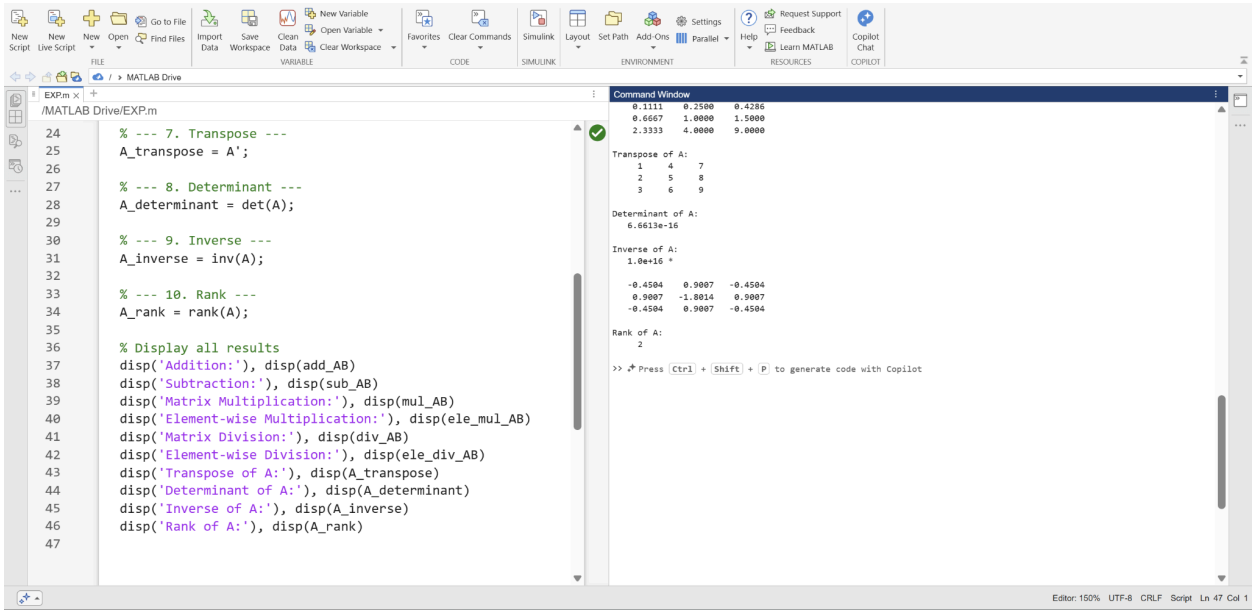
EXPERIMENT 3

Take any matrices as A, B and C.

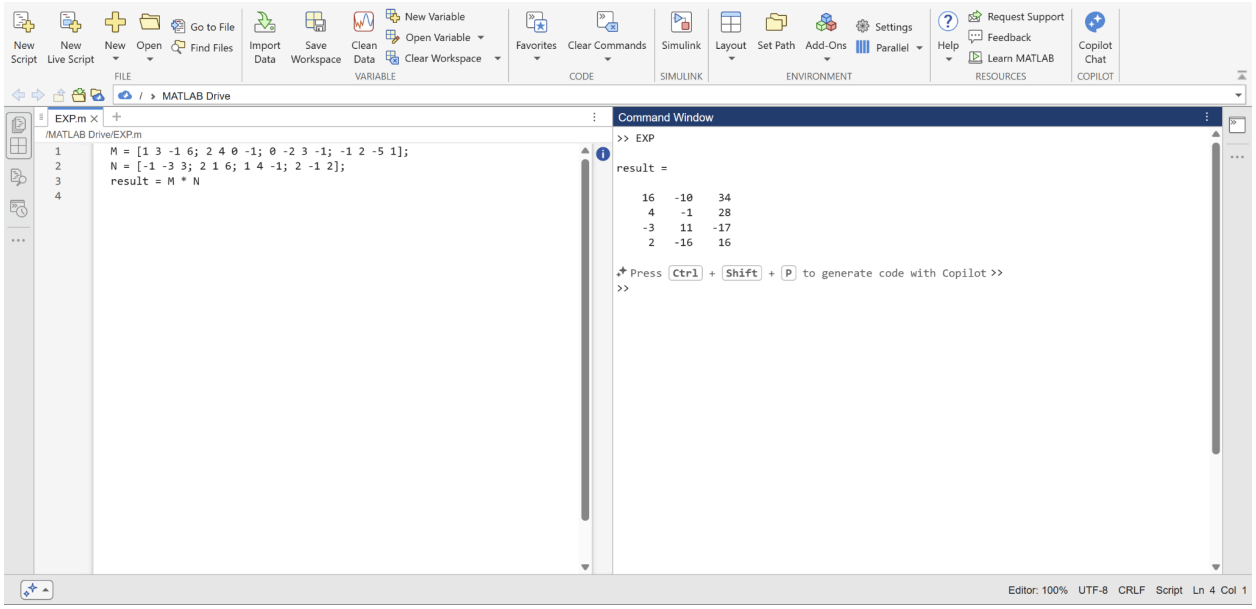
1. Addition & Subtraction: C = A + B, C = A - B
2. Matrix Multiplication: C = A * B (requires inner dimensions to match)
3. Element-wise Multiplication: C = A .* B
4. Division: C = A / B, C = A ./ B
5. Transpose: A'
6. Determinant: det(A)
7. Inverse: inv(A) Rank: rank(A)



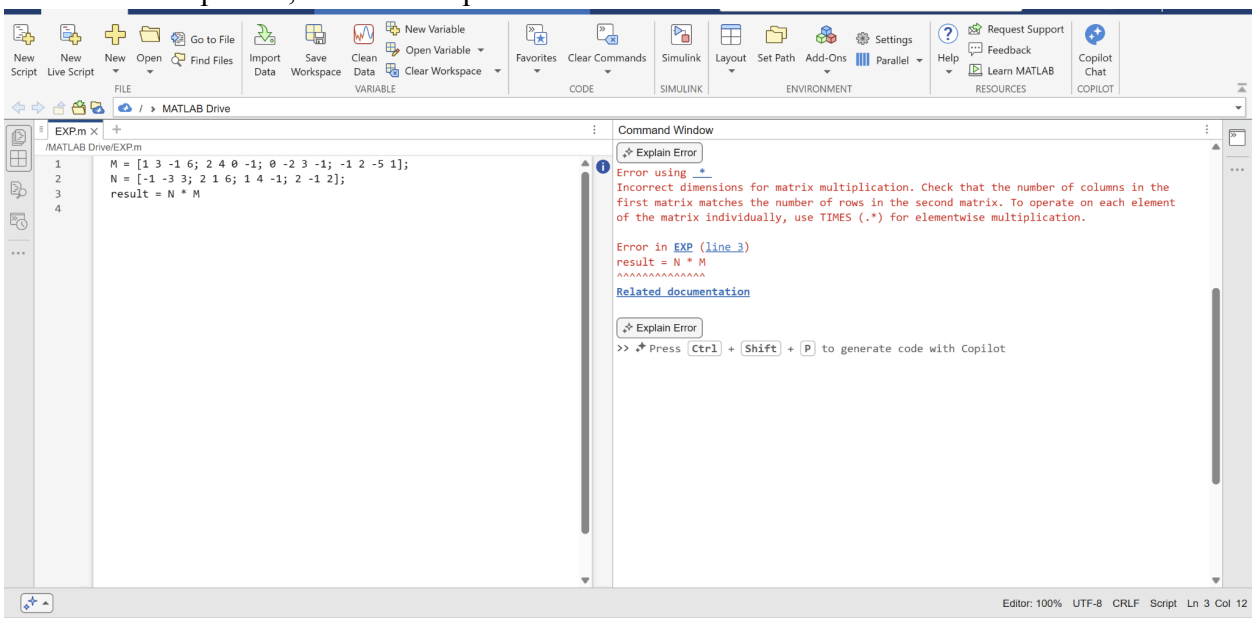


EXERCISE:

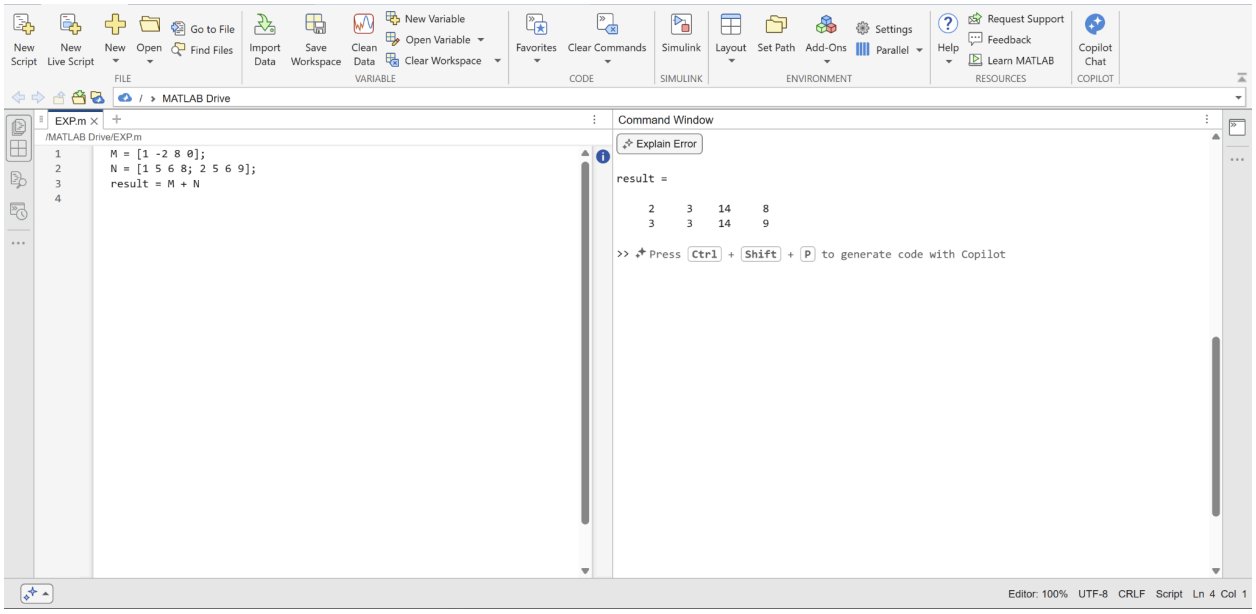
1. Enter the matrix M=[1,3,-1,6:2,4,0,-1;0,-2,3,-1;-1,2,-5,1] and N=[-1,-3,3;2, 1,6;1,4,- 1;2,-1,2], perform multiplication on M and N. Can order of multiplication be switched?Why or why not?



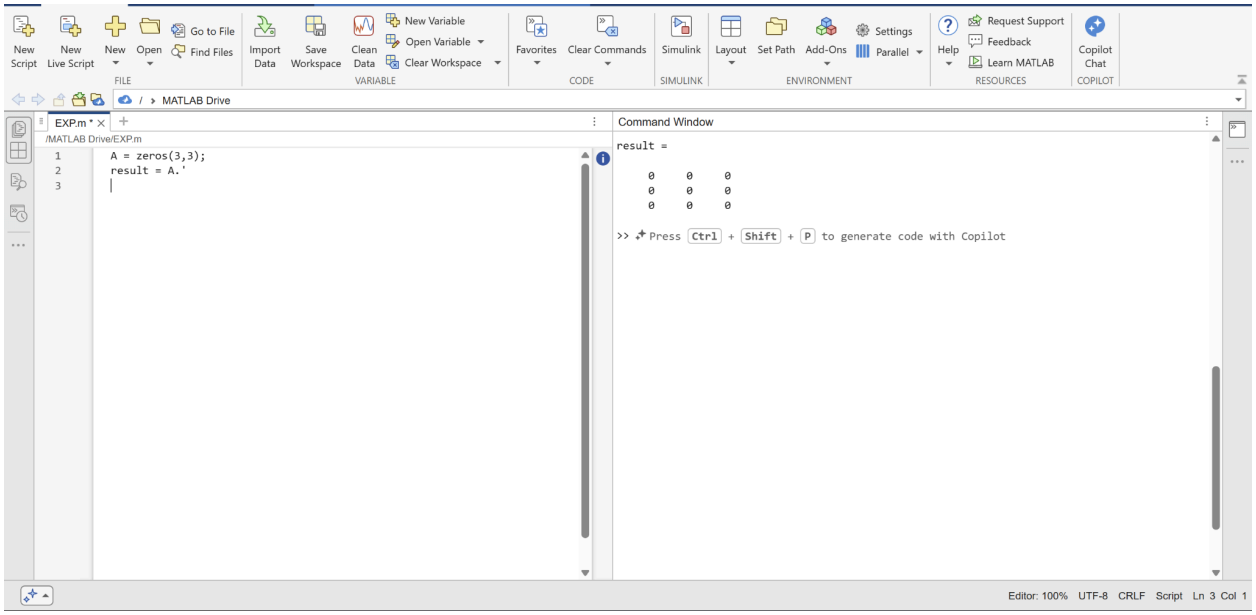
The order of multiplication cannot be switched because the dimensions are incompatible and, even when compatible, matrix multiplication is not commutative.



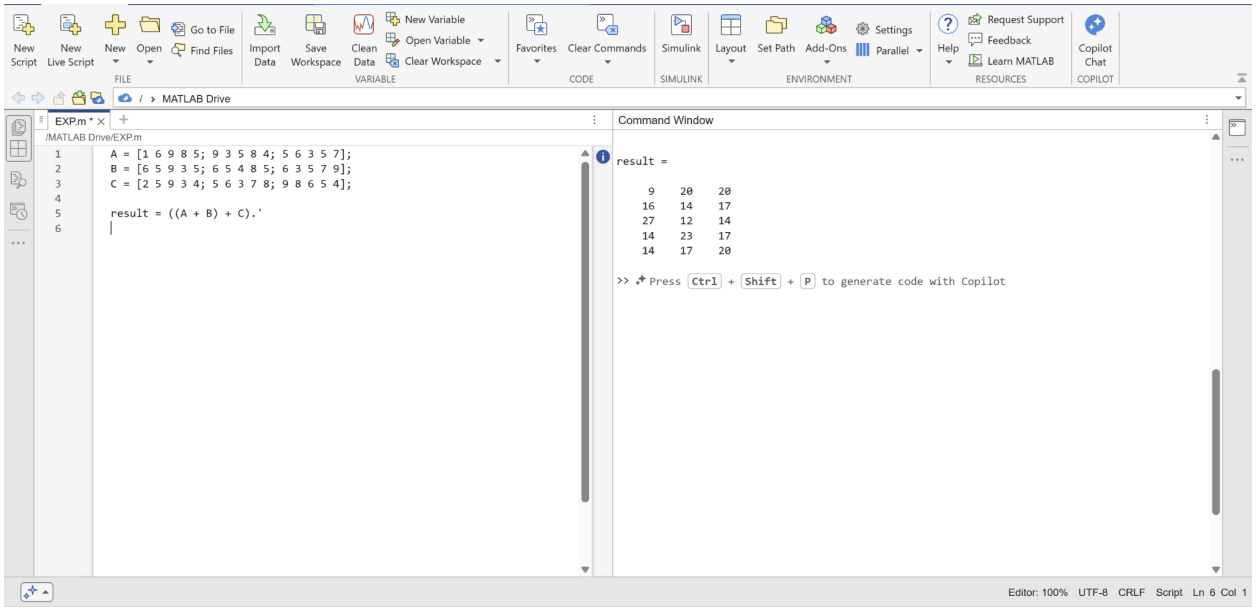
2. Enter the matrix M = [1,-2,8,0] and N = [1 5 6 8; 2 5 6 9] Performaddition onMand N and see how matlab reacts.



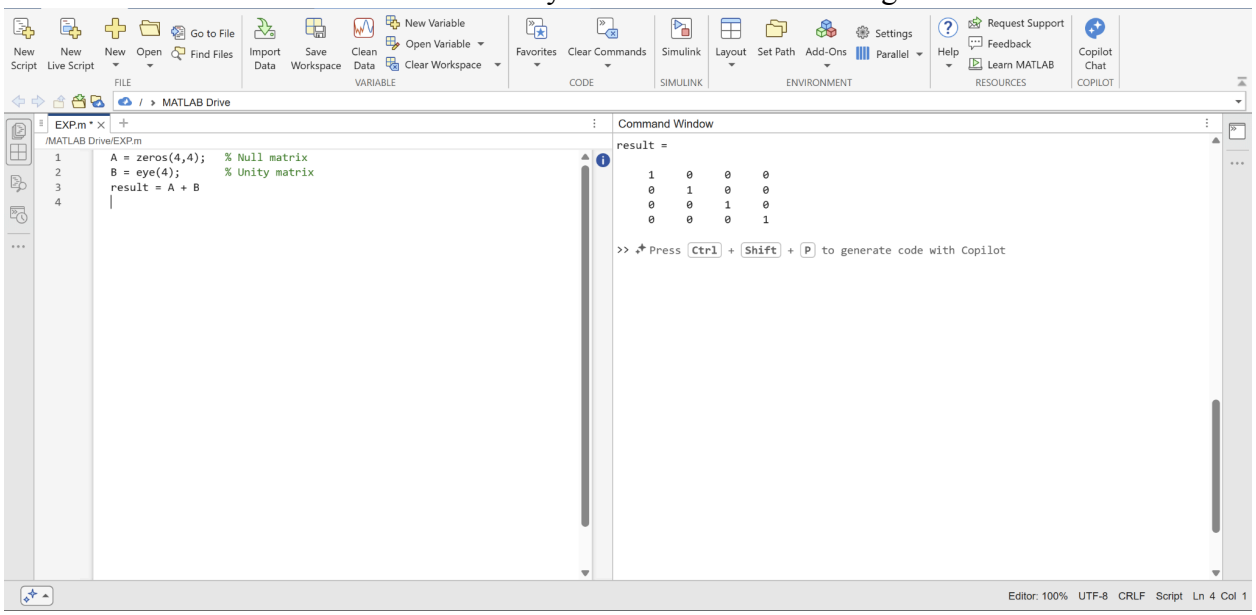
3. Find the transpose of null matrix using MATLAB SIMULINK.



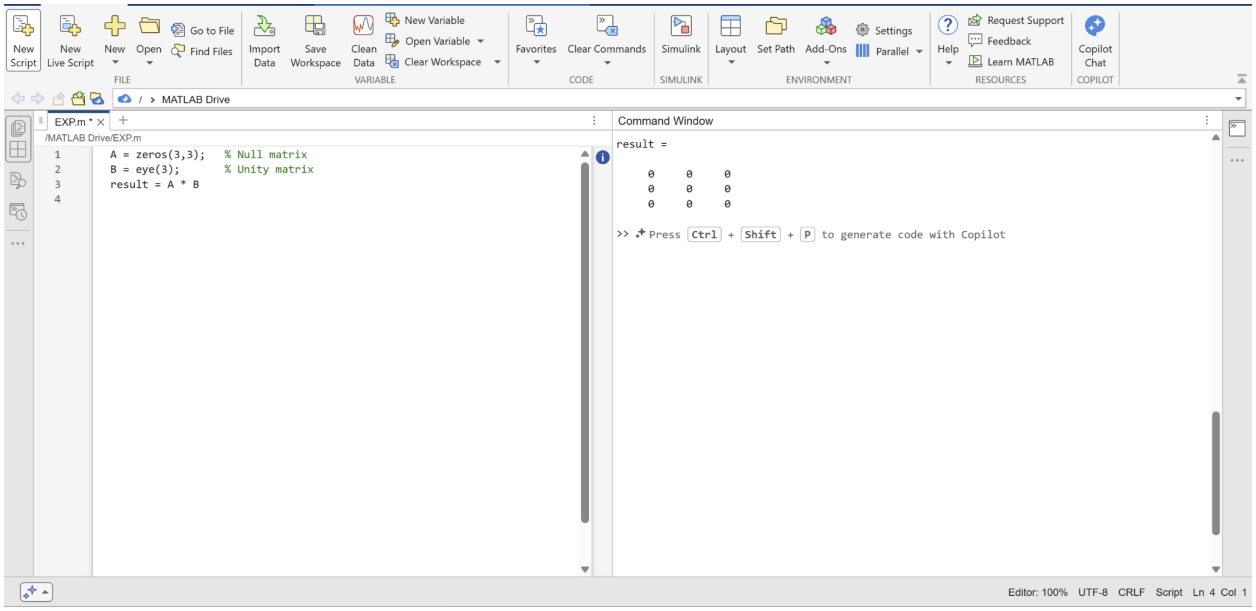
4. Enter the matrix A = [1 6 9 8 5; 9 3 5 8 4; 5 6 3 5 7], B = [6 5 9 3 5; 6 5 4 8 5; 6357 9], C = [2 5 9 3 4; 5 6 3 7 8; 9 8 6 5 4] Find [(A+B)+C]T using MATLABMATLAB SIMULINK.



5. Find the addition of null matrix and unity matrix of order 4x4 using MATLABSIMULINK.



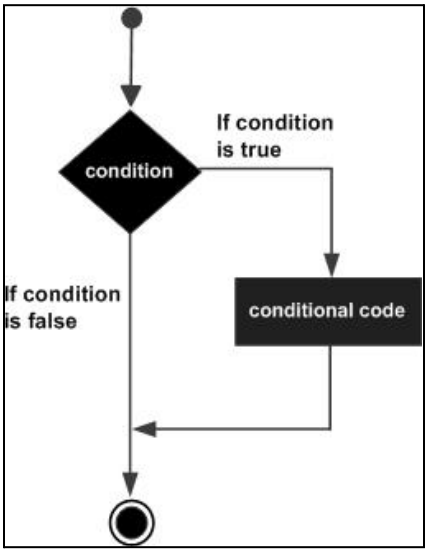
6. Find the multiplication of null matrix and unity matrix of order 3x3 usingMATLAB SIMULINK.

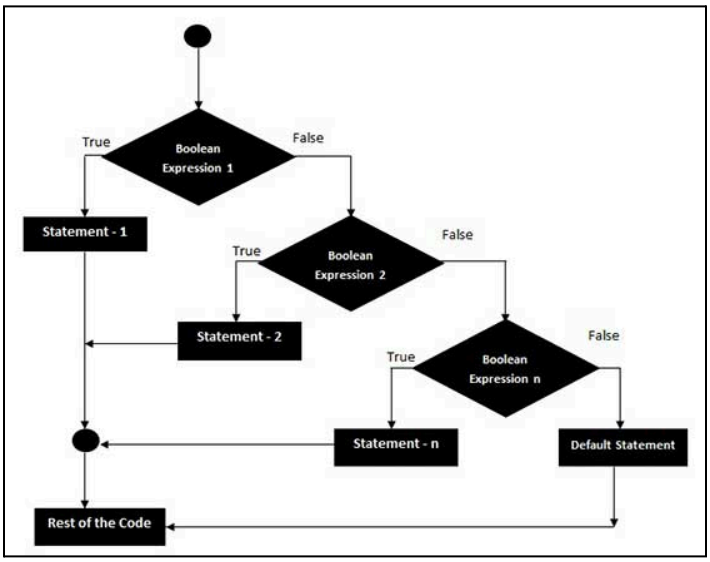


EXPERIMENT 8

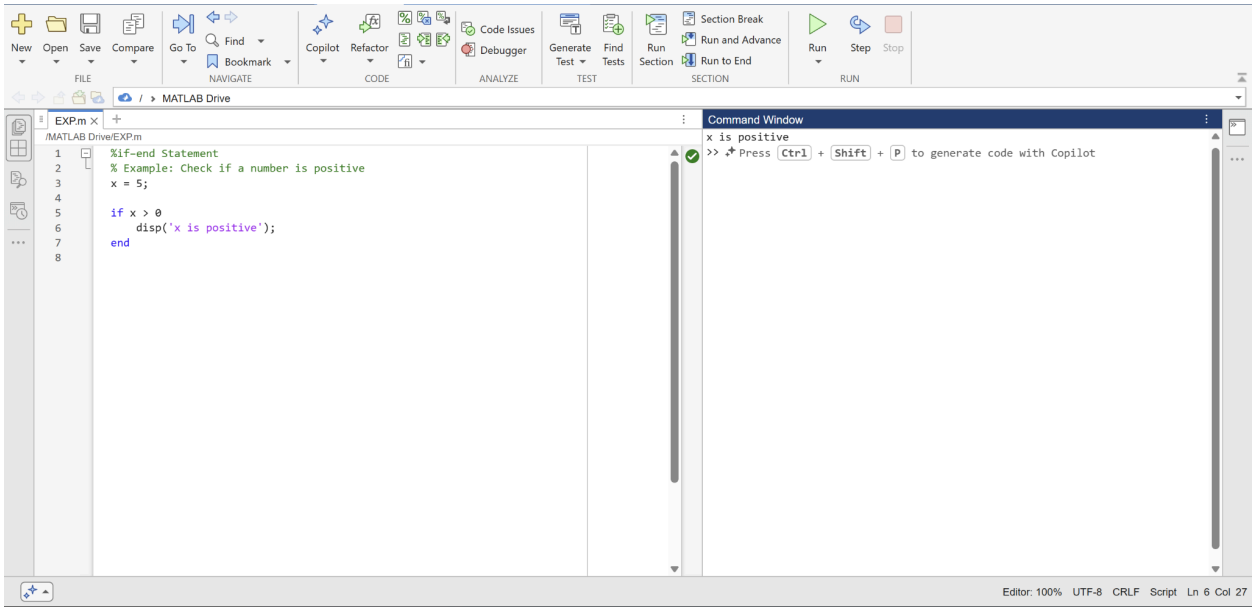
EXERCISE

1. Prepare functioning flowcharts for if-end, if-else-end, and if-elseif-else-end.

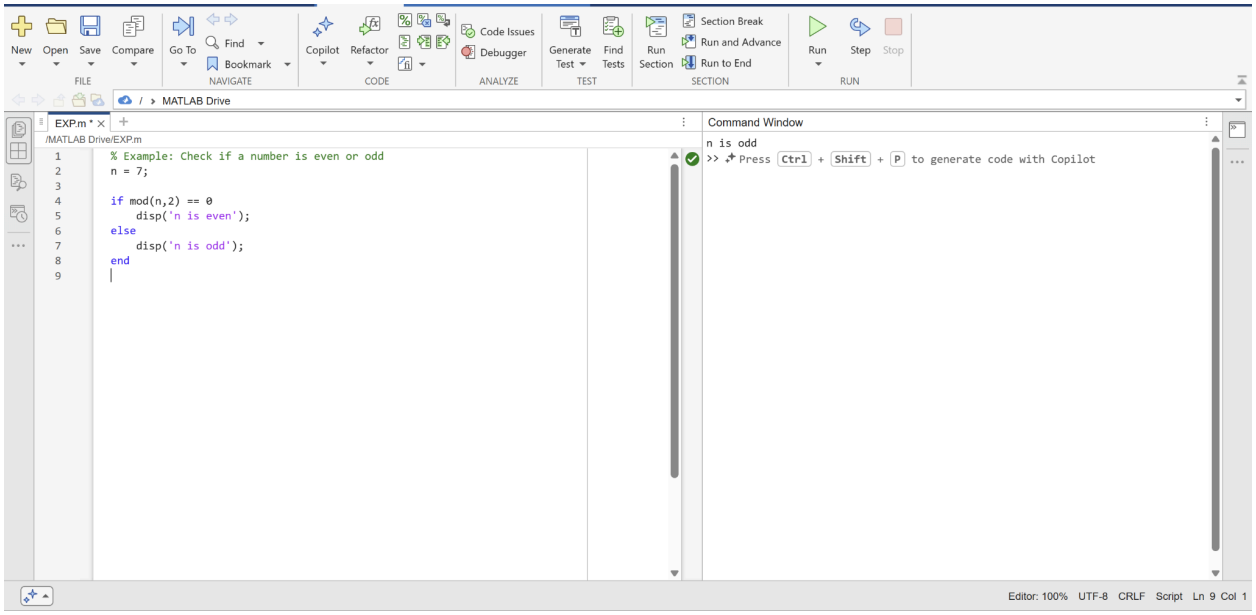




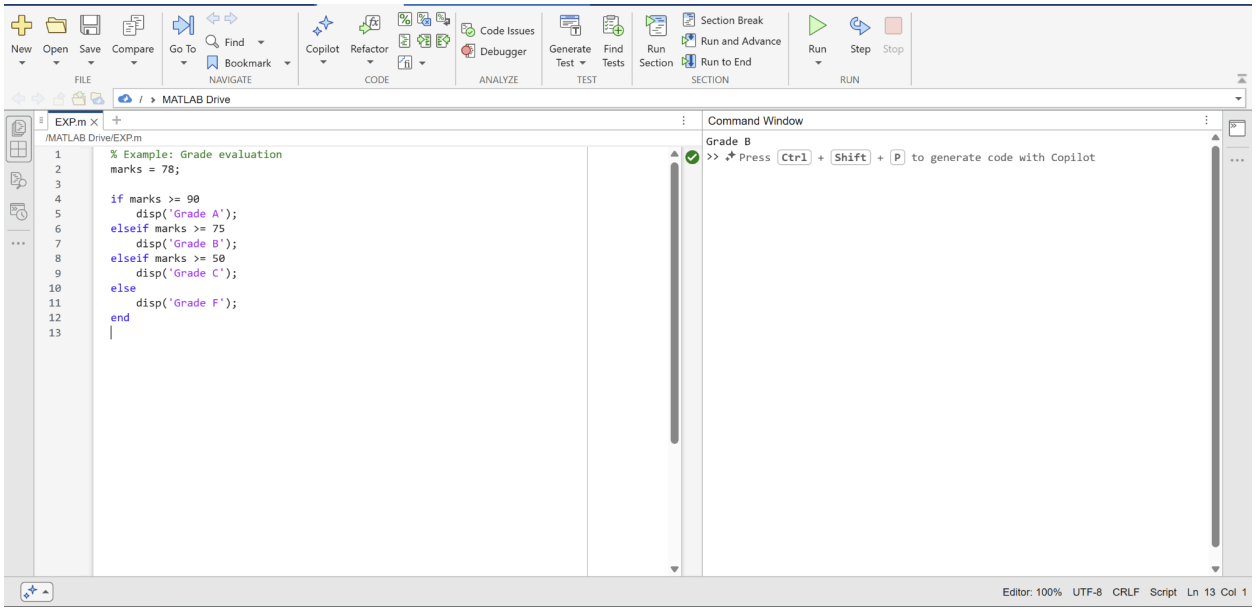
if–end Statement



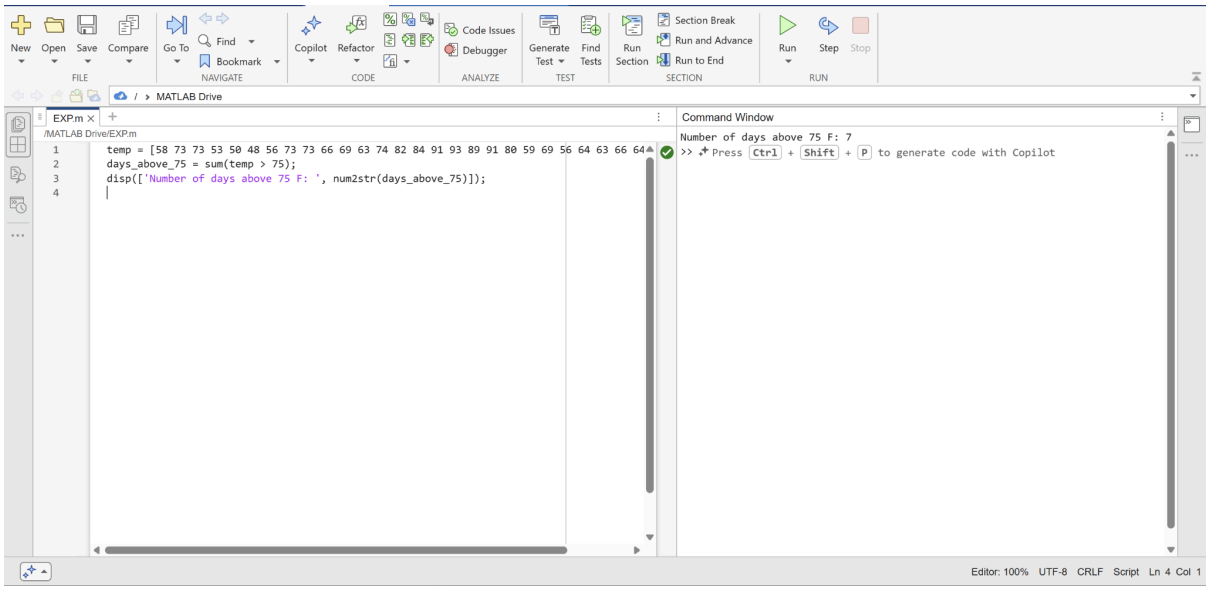
if–else–end Statement



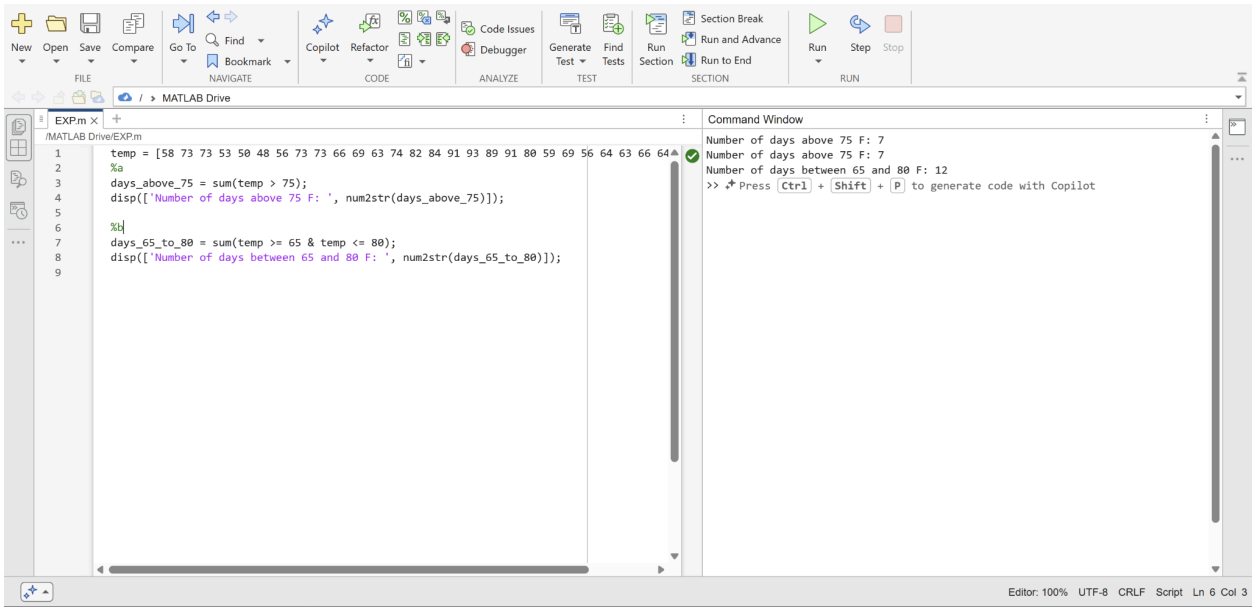
if–elseif–else–end Statement



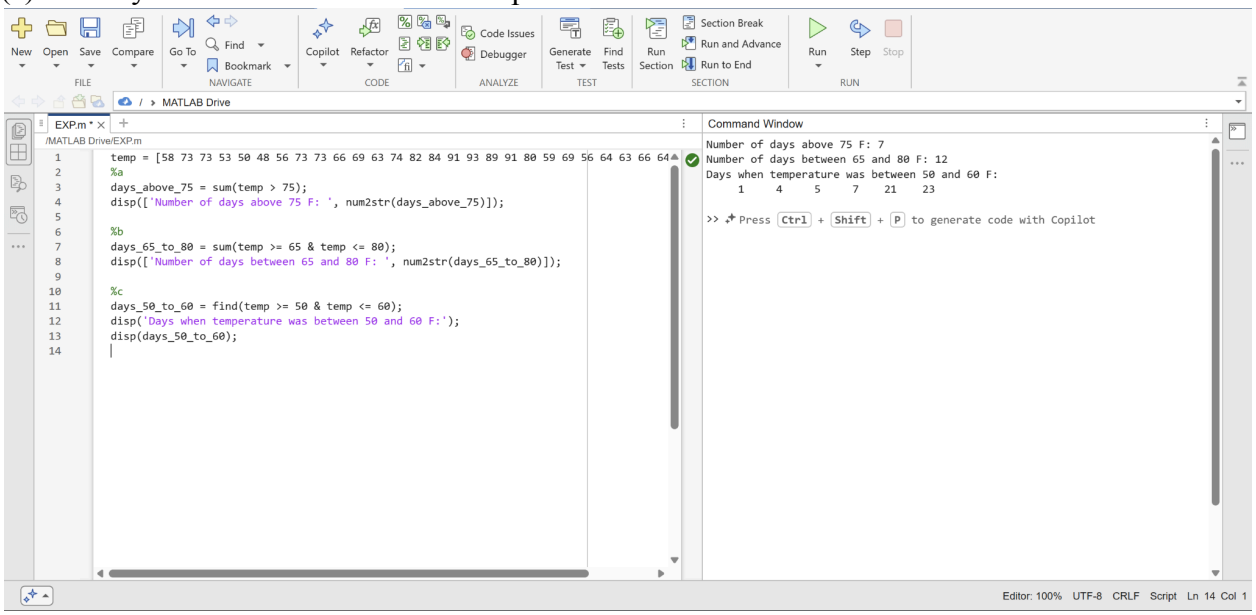
2. The following were the daily maximum temperatures (in F) in Washington, DC, during the month of April 2002: 58 73 73 53 50 48 56 73 73 66 69 63 74 828491 93 89 91 80 59 69 56 64 63 66 64 74 63 69 (data from the U.S. National Oceanic and Atmospheric Administration). Use relational and logical operations to determine the following:
(a) The number of days the temperature was above 75 .



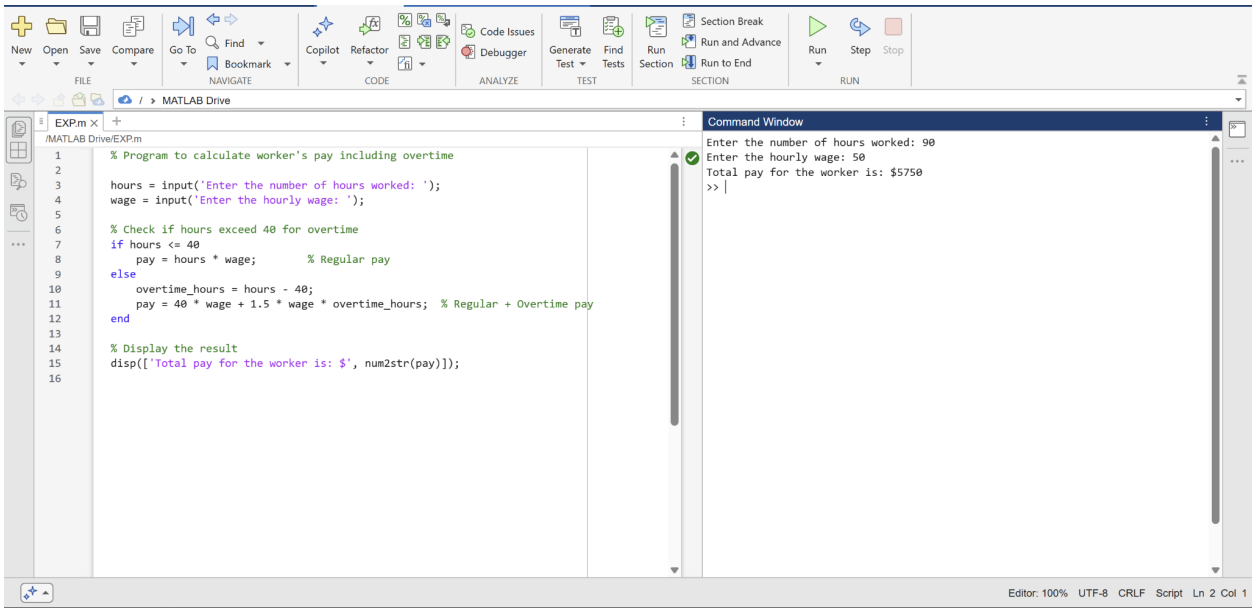
(b) The number of days the temperature was between 65 and 80 .



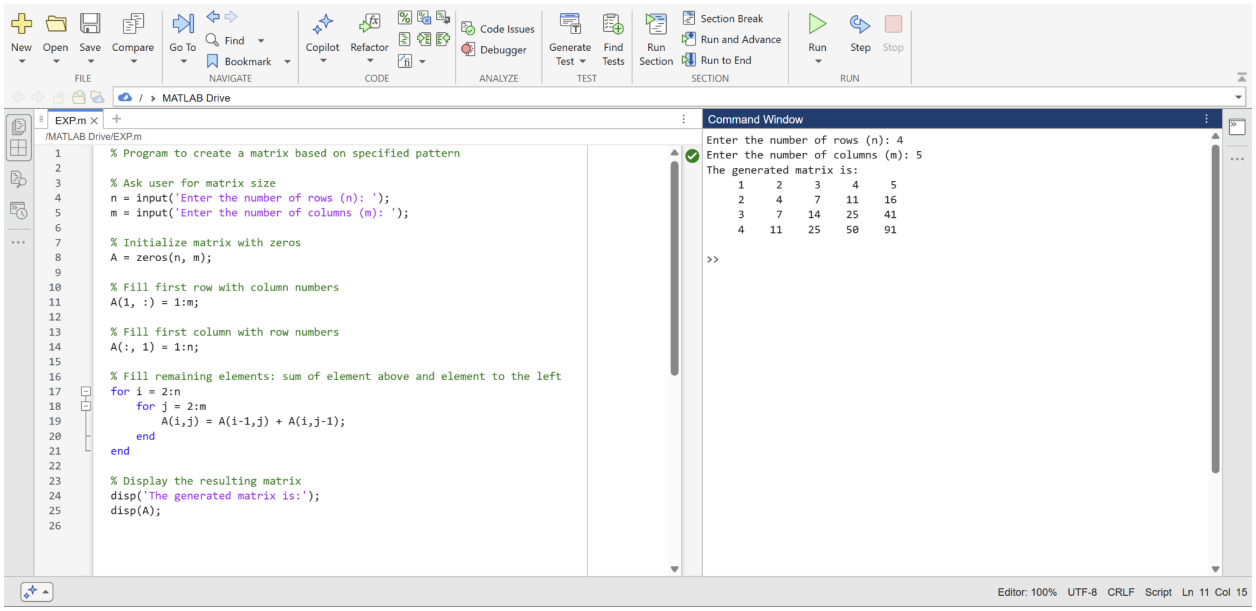
(c) The days of the month when the temperature was between 50 and 60 .



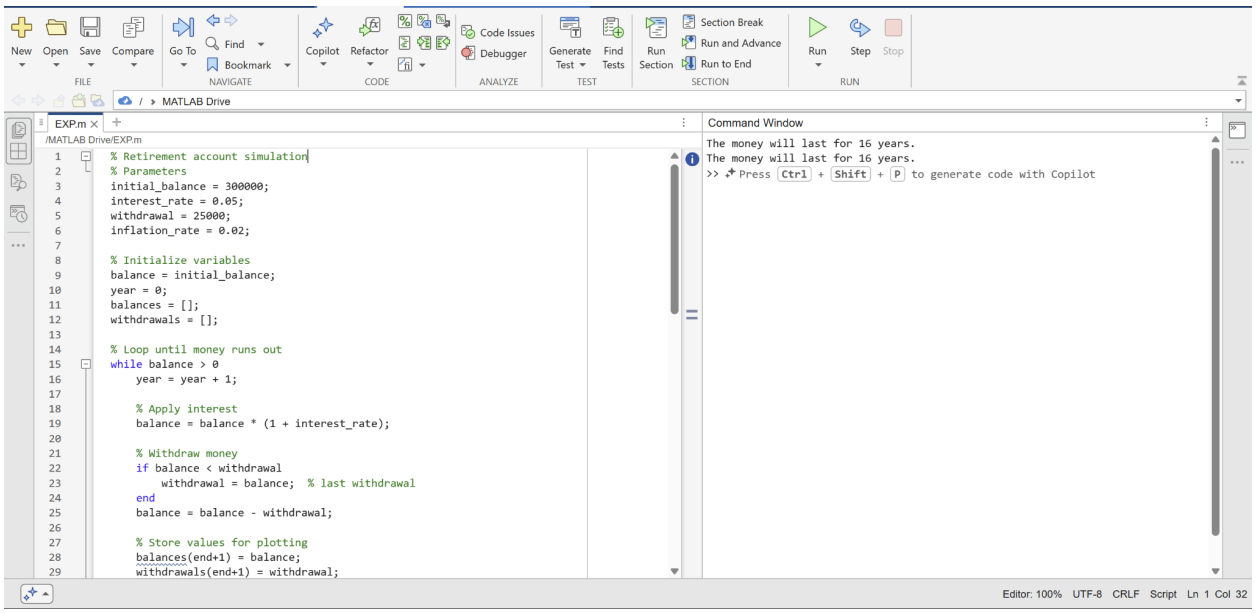
3. A worker is paid according to his hourly wage up to 40 hours, and 50%more for overtime. Write a program in a script file that calculates the pay to a worker. Theprogram asks the user to enter the number of hours and the hourly wage. Theprogram then displays the pay.

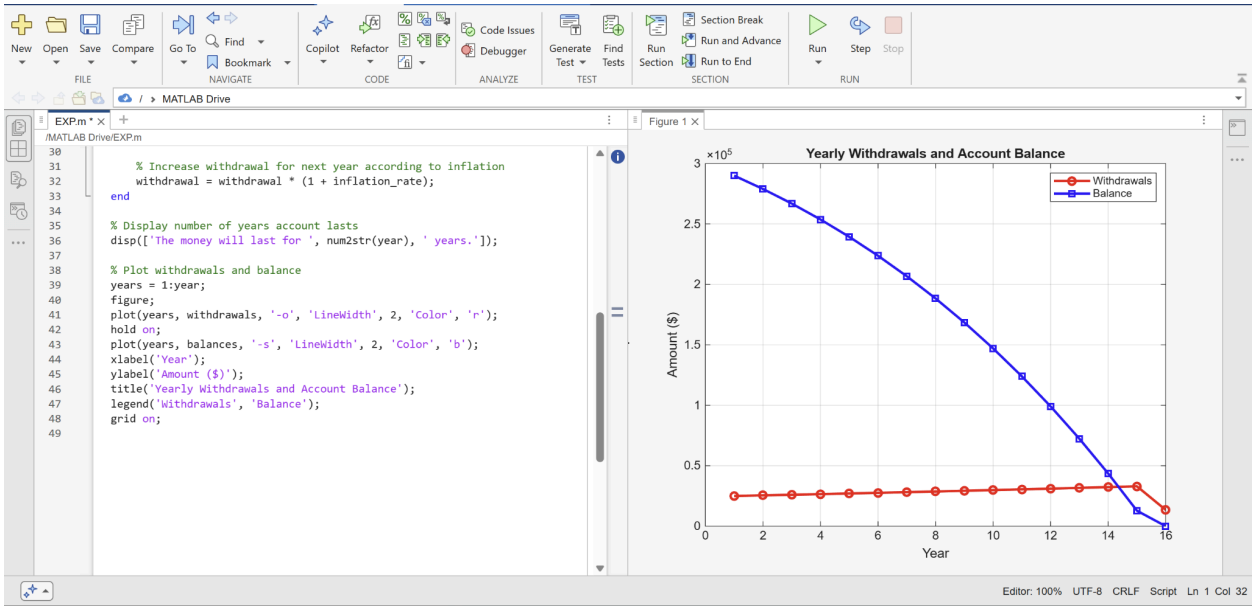


4. Write a program in a script file that creates an matrix with elements that have thefollowing values. The value of each element in the first row is the number of thecolumn. The value of each element in the first column is the number of the row. The rest of the elements each has a value equal to the sum of the element aboveit and the element to the left. When executed, the program asks the user to enter values for n and m.

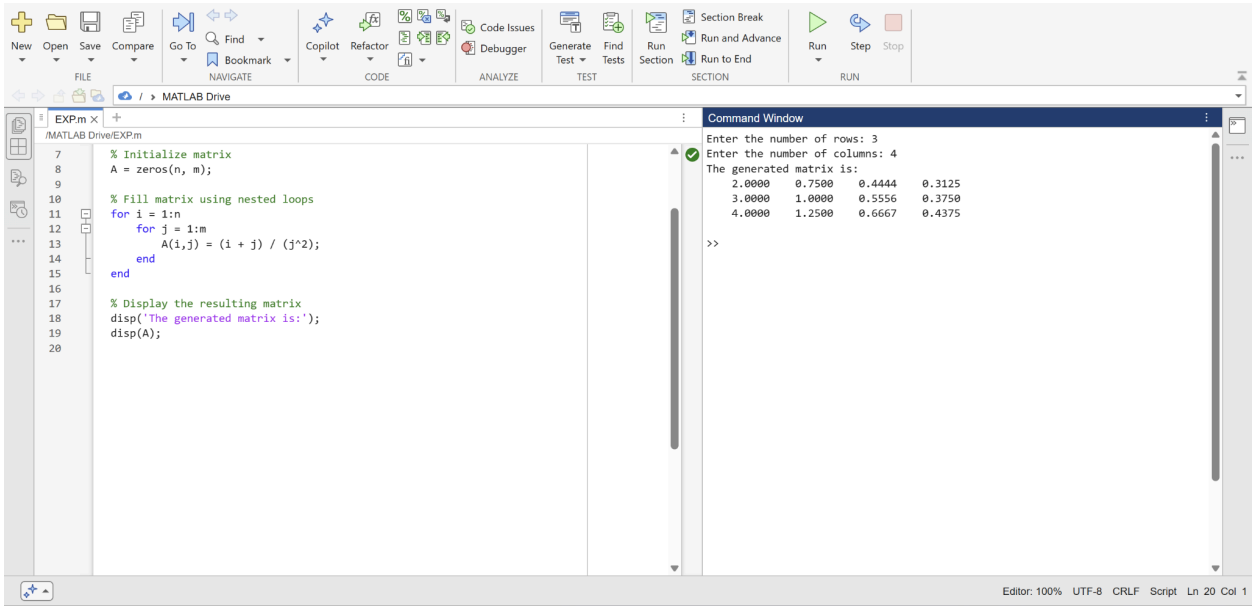


5. A person in retirement is depositing $300,000 in a saving account that pays 5%interest per year. The person plans to withdraw money from the account onceayear. He starts by withdrawing $25,000 after the first year, and in future years heincreases the amount he withdraws according to the inflation rate. For example, if the inflation rate is 3%, he withdraws $25,750 after the second year. Calculate thenumber of years the money in the account will last assuming a constant yearlyinflation rate of 2%. Make a plot that shows the yearly withdrawals andthebalance of the account over the years.

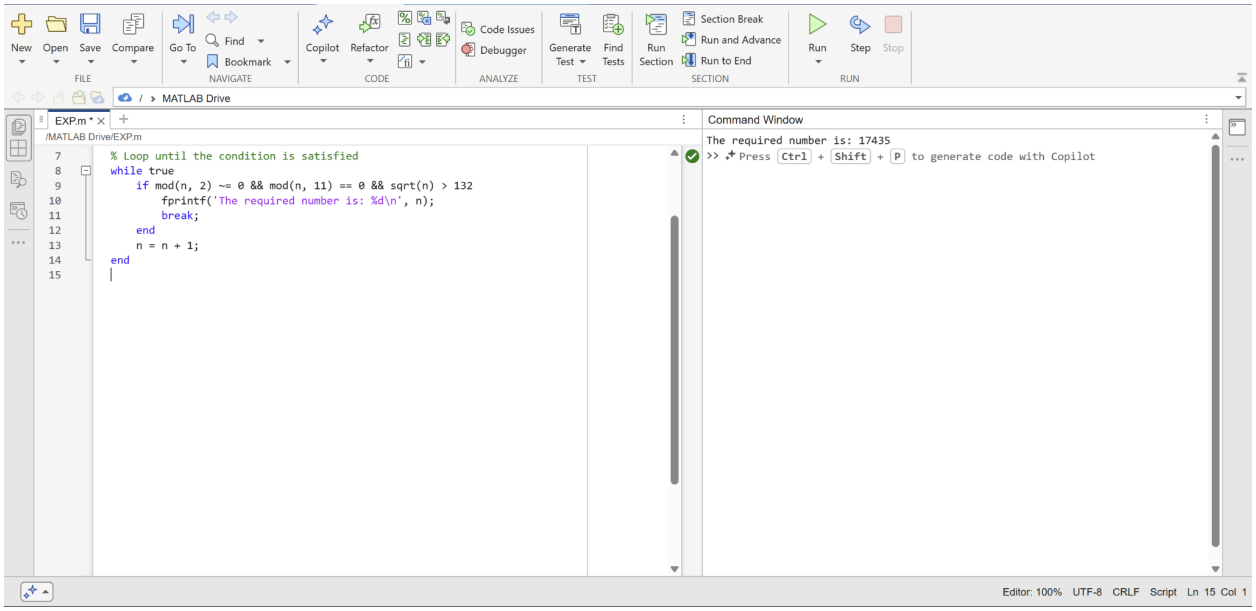




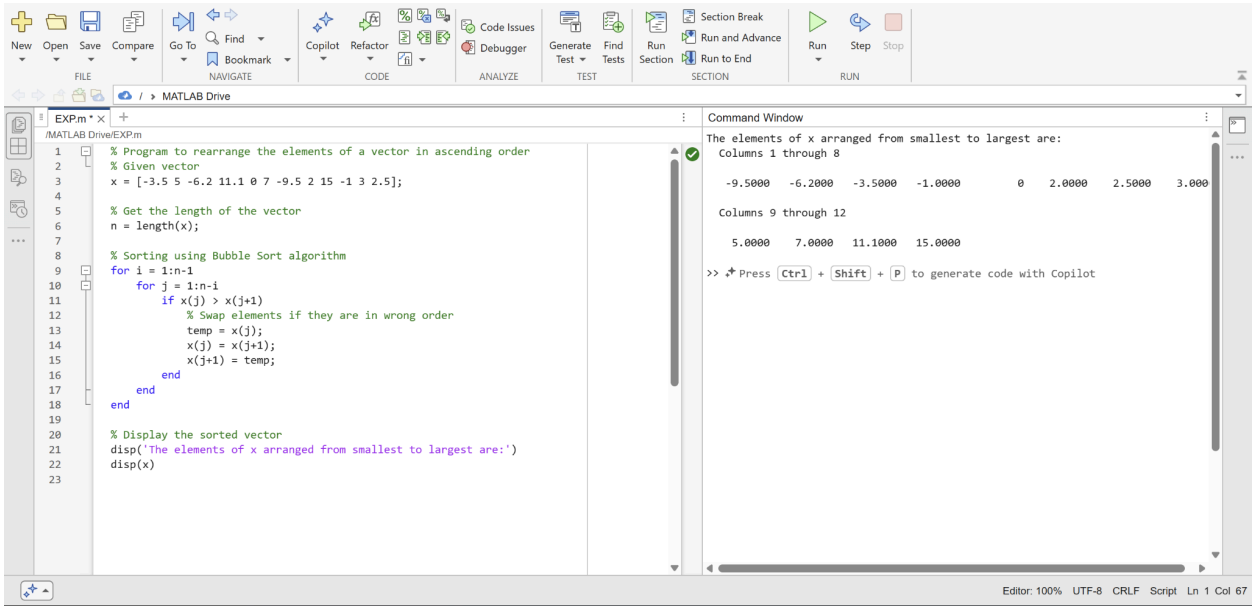
6. Use loops to create a matrix in which the value of each element is the sumof its row number and its column number divided by the square of its column number.



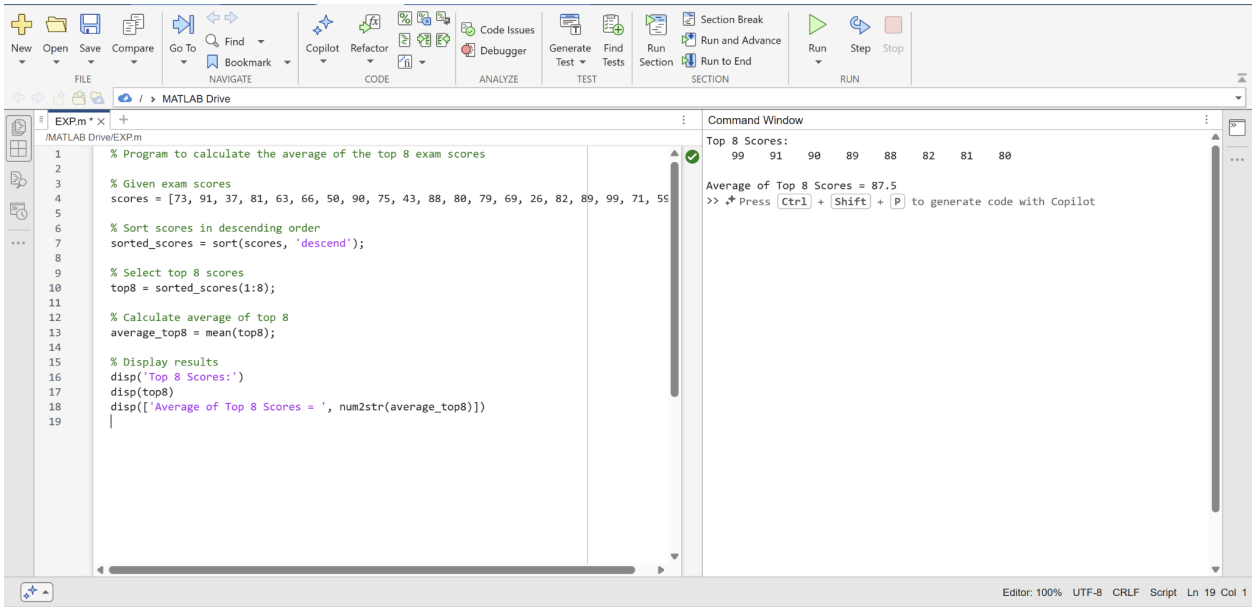
7. Write a program in a script file that finds the smallest odd integer that is divisible by 11 and whose square root is greater than 132. Use a loop in the program. The loop should start from 1 and stop when the number is found. The program prints the message “The required number is:” and then prints the number.



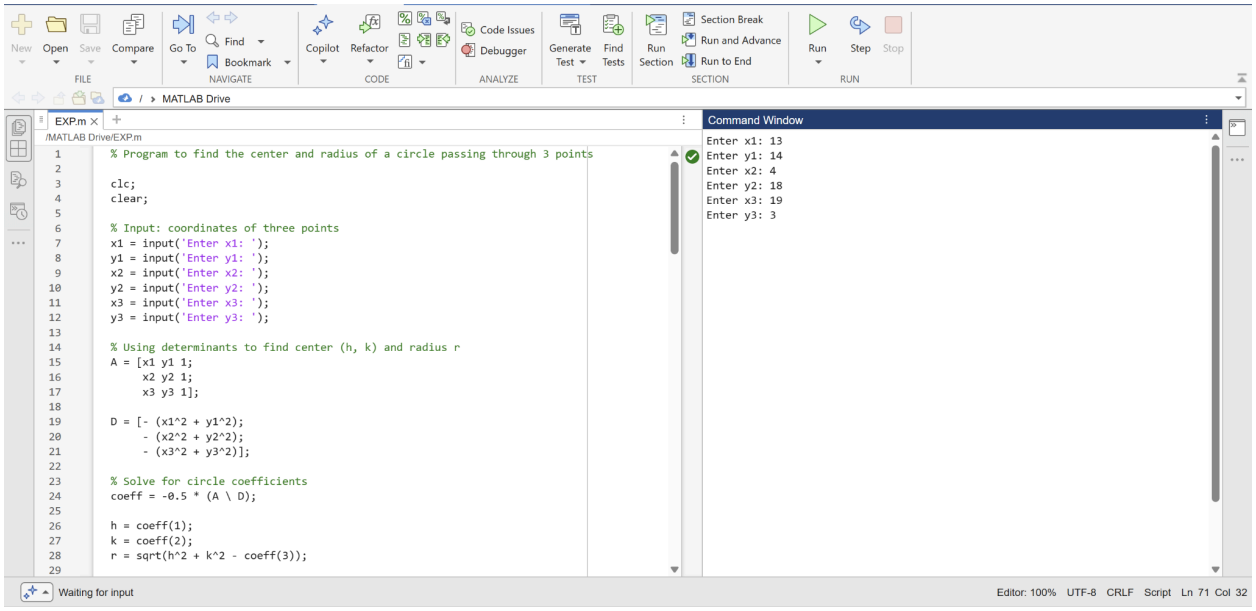
8. A vector is given by x = [–3.5 5 –6.2 11.1 0 7 –9.5 2 15 –1 3 2.5]. Usingconditional statements and loops, write a program that rearranges the elements of x in order from the smallest to the largest. Do not use MATLAB’s built-infunction sort.

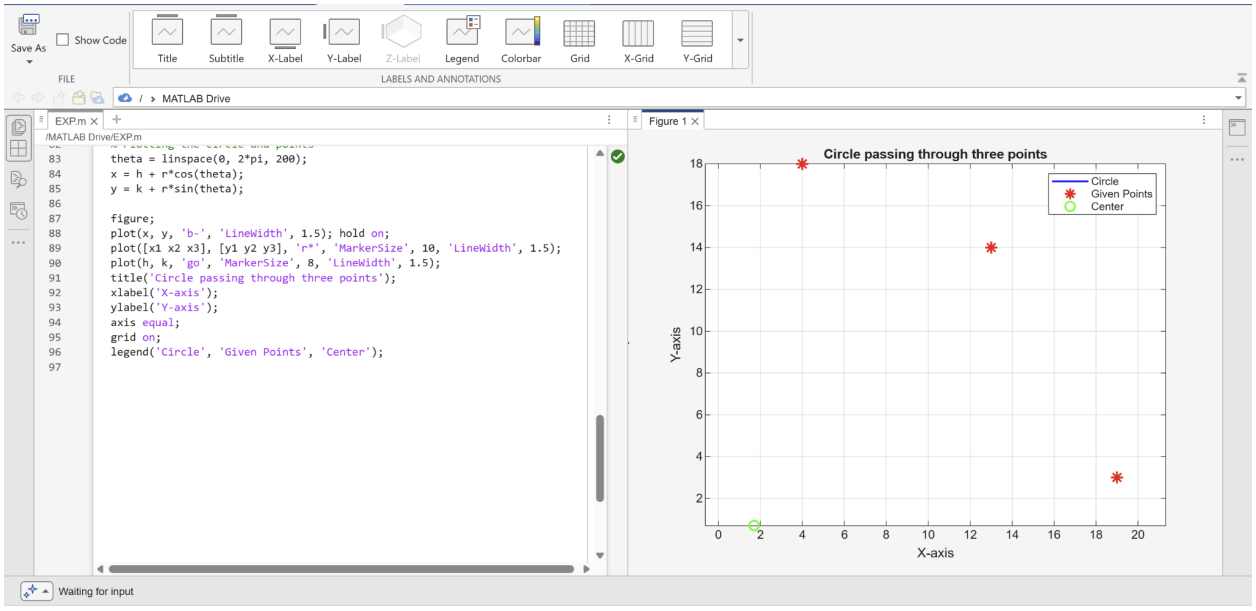


9. The following is a list of 20 exam scores. Write a computer programthat calculates the average of the top 8 scores. Exam scores: 73, 91, 37, 81, 63, 66, 50, 90, 75, 43, 88, 80, 79, 69, 26, 82, 89, 99, 71, 59

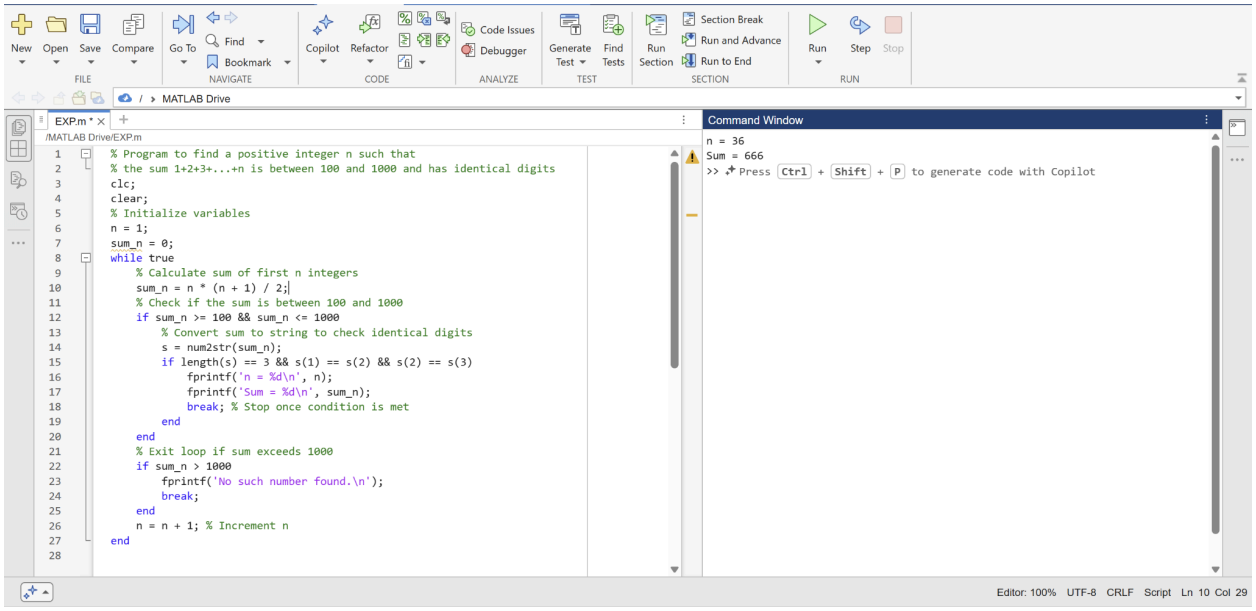


10. Write a program that determines the center and the radius of a circle that passes through three given points. The program asks the user to enter the coordinates of the points one at a time. The program displays the coordinate of the center andthe radius, and makes a plot of the circle and the three points displayed ontheplot with asterisk markers. Execute the program to find the circle that passes through the points (13, 15), (4, 18), and (19, 3).





11. Write a MATLAB program in a script file that finds a positive integer n suchthat the sum of all the integers 1+2+3 +….+n is a number between 100 and 1000whose three digits are identical. As output the program displays the integer nandthe corresponding sum.



12. A twin primes is a pair of prime numbers such that the difference between themis 2 (for example, 17 and 19). Write a MATLAB program that finds all the twinprimes between 10 and 500. The program displays the results in a two-columnmatrix in which each row is a twin prime.