**Experiment No. 01**

* 1. **Experiment Name**

Introduction to MATLAB programming

* 1. **Objectives**
* To become acquainted with the MATLAB functions and necessary parameters
* To learn how to implement MATLAB code to a system using computational methods
  1. **Apparatus**
* MATLAB
  1. **Problem**

**(i)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Roll | CT1 | CT2 | CT3 | CT4 | CT5 | CT6 |
| 1801170 | 10 | 13 | 14 | 12 | 16 | 15 |
| 1801171 | 11 | 14 | 15 | 18 | 15 | 14 |
| 1801172 | 14 | 10 | 15 | 18 | 17 | 14 |
| 1801173 | 16 | 12 | 15 | 20 | 17 | 14 |
| 1801174 | 12 | 11 | 14 | 18 | 16 | 14 |

(ii)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A | 5 | 0 | -10 | 27 | 1 | 15 |

* 1. **MATLAB Code**
     1. **For Problem (i)**

clc; %Clears previous data from command window

clear all; %Removes all variables from the current workspace

cd('F:\Study material\Lab\3-2\Power System I'); %Changes file directory

x = xlsread('Exp01') %Imports data from excel file

fprintf('\n Roll No \tCTI CT2 CT3 CT4 CT5 CT6\n') %Display the text

disp(x) %Display the data inside variable

n=length(x) ; %Determines the number of column

y = x(:,2:n) ; %Isolates the data to be averaged from the roll

fprintf('Marks:\n') %Display the text

disp(y) %Display the data inside variable

w = sort(y,2,'descend'); %Rearranging the columns in descending order. 2 is for descending rawwise

fprintf('\nSorting descending order rawwise: \n') %Display the text

disp(w) %display the data inside variable

z = w(:,1:3) %Takes the first three columns containing highest three marks

fprintf('\nBest three marks: \n') %Display the text

disp(z) %Display the data inside variable

m = mean(z,2) %Calculates mean of the highest three marks. 2 is for doing the action rawwise

fprintf('\nAverage marks: \n') %Display the text

disp(m) %Display the data inside variable

Output = round(m) %Round the calculated data

fprintf('Rounding the average marks: \n') %Display the text

disp(Output) %display the value inside variable

Roll=x(:,1) %Taking the column of Roll

Y=[Roll Output] %Forming a matrix of column Roll and Attained data as marks

fprintf(' Roll No Attained Marks \n') %Display the text

disp(Y) %Display the marks inside variable

* + 1. **For Problem (ii)**

clc; %Clears previous data from command window

clear all; %Removes all variables from the current workspace

cd('F:\Study material\Lab\3-2\Power System I'); %Changes file directory

Matrix=xlsread('Exp01p02'); %Reads from excel file

fprintf('Matrix:'); %Prints the data

disp(Matrices) %Shows the output

n=length(Matrix); %Determines the number of elements

%Ascending

for j=1:n %Campare first elements

for k=j+1:n %Campare second elements

if Matrix(j)>=Matrix(k) %Compare greater or not

m=Matrix(j); %Store the greater number in a variable

Matrix(j)=Matrix(k); %Replace the greater number by the smaller one

Matrix(k)=m; %Replace the smaller number with greater number

end

end

end

fprintf('Ascending: '); %Print the data in desired order

%Descending

disp(Matrix) %Show the output

Output=xlsread('Exp01p02'); %Read from excel file

n=length(Output); %Read the number of elements

for j=1:n %Campare first elements

for k=j+1:n %Campare second elements

if Output(j)<=Output(k) %Compare samller or not

m=Output(j);%Store the smaller number in a variable

Output(j)=Output(k);%Replace the smaller number by the smaller one

Output(k)=m; %Replace the greater number with smaller number

end

end

end

fprintf('Descending: '); %Printing the data

disp(Output) %Show the output

* 1. **Output**
     1. **For Problem (i)**

x =

1801170 10 13 14 12 16 15

1801171 11 14 15 18 15 14

1801172 14 10 15 18 17 14

1801173 16 12 15 20 17 14

1801174 12 11 14 18 16 14

1801175 15 10 14 17 19 14

Roll No CTI CT2 CT3 CT4 CT5 CT6

1801170 10 13 14 12 16 15

1801171 11 14 15 18 15 14

1801172 14 10 15 18 17 14

1801173 16 12 15 20 17 14

1801174 12 11 14 18 16 14

1801175 15 10 14 17 19 14

Marks:

10 13 14 12 16 15

11 14 15 18 15 14

14 10 15 18 17 14

16 12 15 20 17 14

12 11 14 18 16 14

15 10 14 17 19 14

Sorting descending order rawwise:

16 15 14 13 12 10

18 15 15 14 14 11

18 17 15 14 14 10

20 17 16 15 14 12

18 16 14 14 12 11

19 17 15 14 14 10

z =

16 15 14

18 15 15

18 17 15

20 17 16

18 16 14

19 17 15

Best three marks:

16 15 14

18 15 15

18 17 15

20 17 16

18 16 14

19 17 15

m =

15.0000

16.0000

16.6667

17.6667

16.0000

17.0000

Average marks:

15.0000

16.0000

16.6667

17.6667

16.0000

17.0000

Output =

15

16

17

18

16

17

Rounding the average marks:

15

16

17

18

16

17

Roll =

1801170

1801171

1801172

1801173

1801174

1801175

Y =

1801170 15

1801171 16

1801172 17

1801173 18

1801174 16

1801175 17

Roll No Attained Marks

1801170 15

1801171 16

1801172 17

1801173 18

1801174 16

1801175 17

* + 1. **For Problem (ii)**

Matrix: 5 0 -10 27 1 15 30

Ascending: -10 0 1 5 15 27 30

Descending: 30 27 15 5 1 0 -10

* 1. **Discussion & Conclusion**

We used MATLAB code to solve the problem in this experiment. In the first problem, which is quite practical, we find the average class test score for six different students. In this case, we calculated the output for each student by taking the best three marks and averaging them. The elements of a 7x1 matrix were sorted in both ascending and descending order in the second problem.

Through this experiment, we become acquainted with the implementation and scope of MATLAB in computational methods and systems by solving these problems. Thus the objective of the experiment was achieved.