



# LEADING UNIVERSITY, SYLHET

Dept. of Computer Science & Engineering

## Lab-1

Course Code: *CSE-3112*

Course Title: *Numerical Methods Sessional*

### **Submitted To:**

Mohammed Ariful Islam

Lecturer

Department of Computer Science & Engineering

Leading University, Sylhet.

### **Submitted By:**

*Md. Badrul Alom Tawsyat*

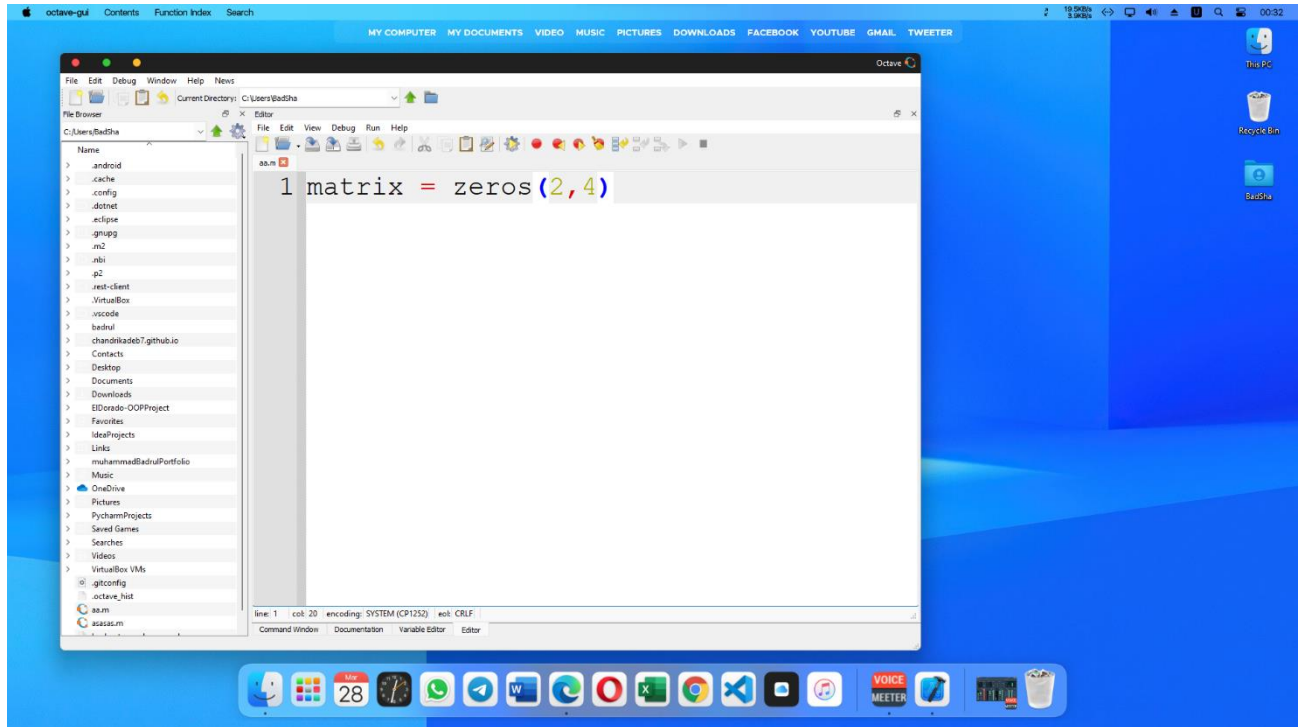
*2012020216*

28.03.2022

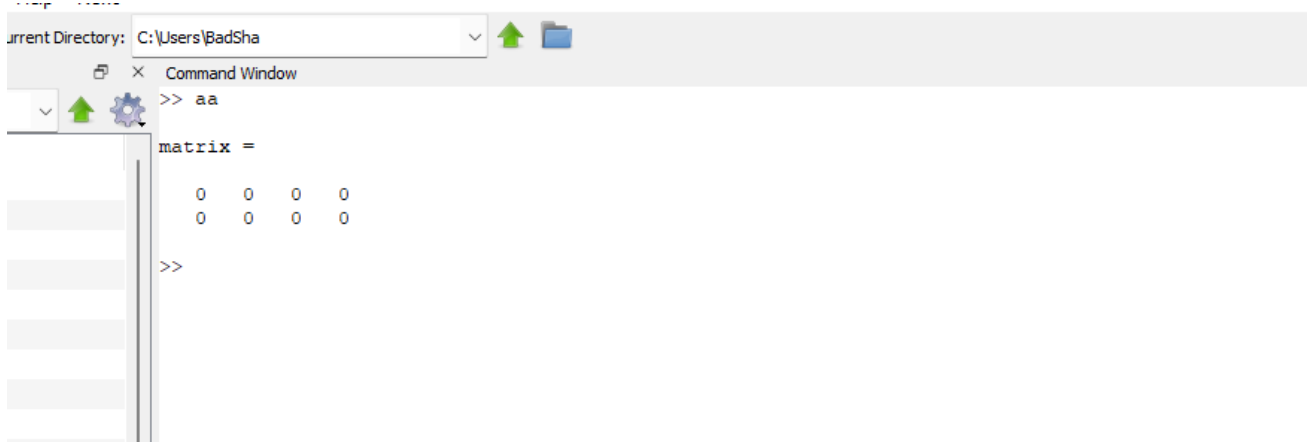
## Answer to the Question no 01

**(a)**

*Code:*

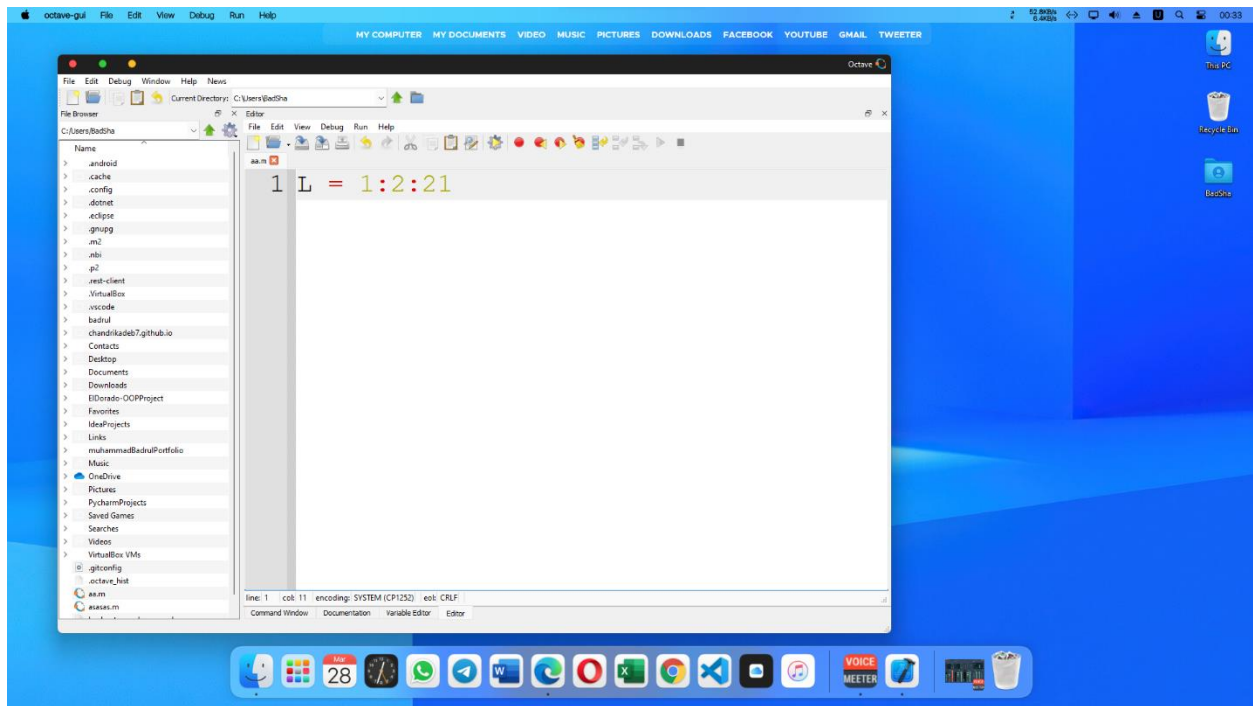


*Output:*



(b)

Code:

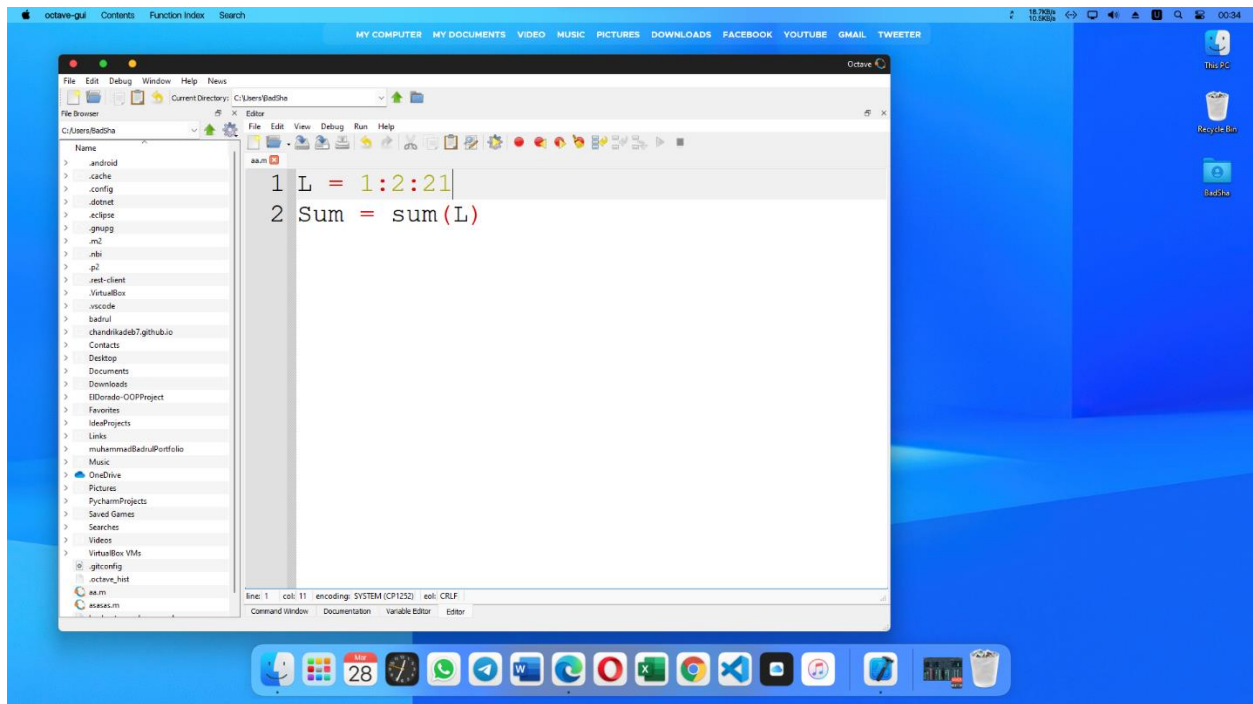


Output:

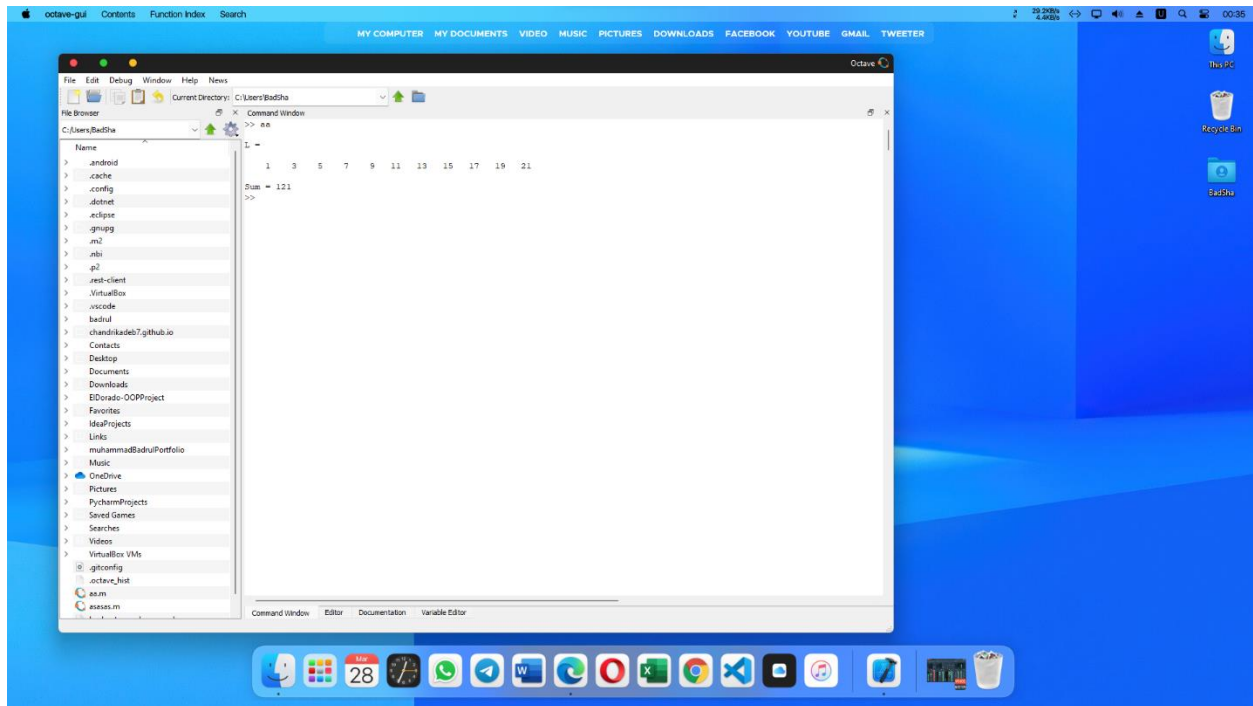


(c)

Code:

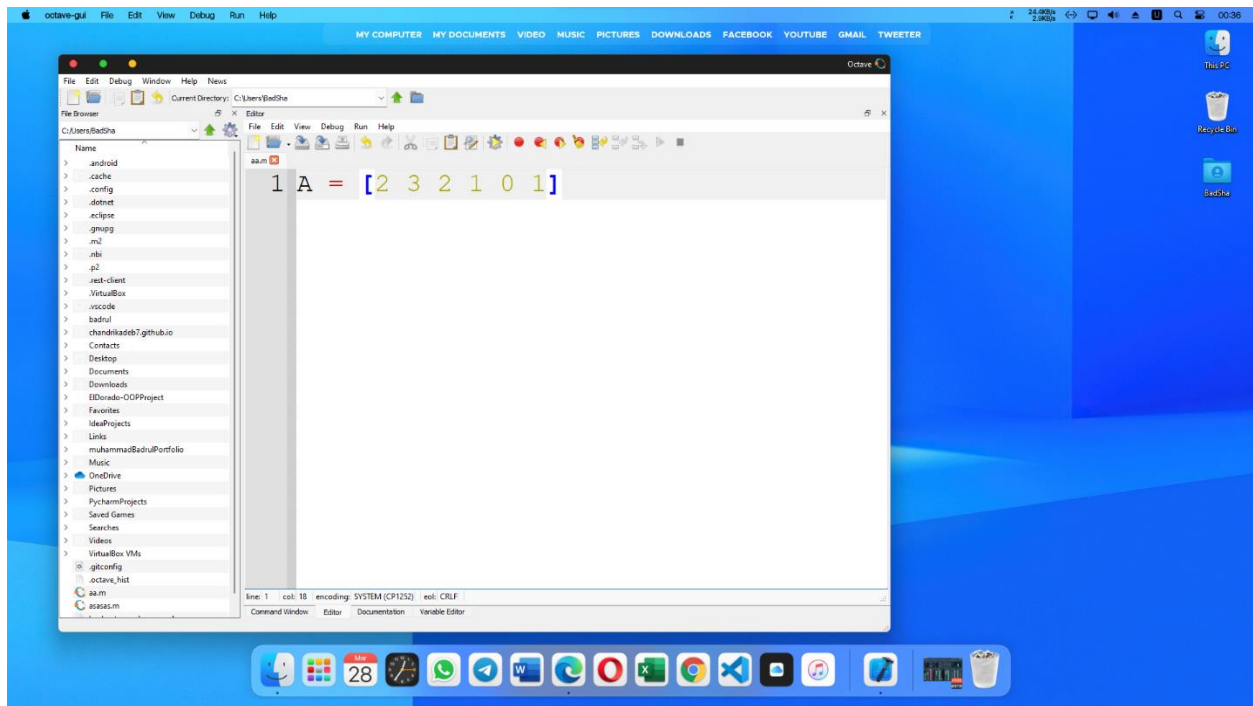


Output:

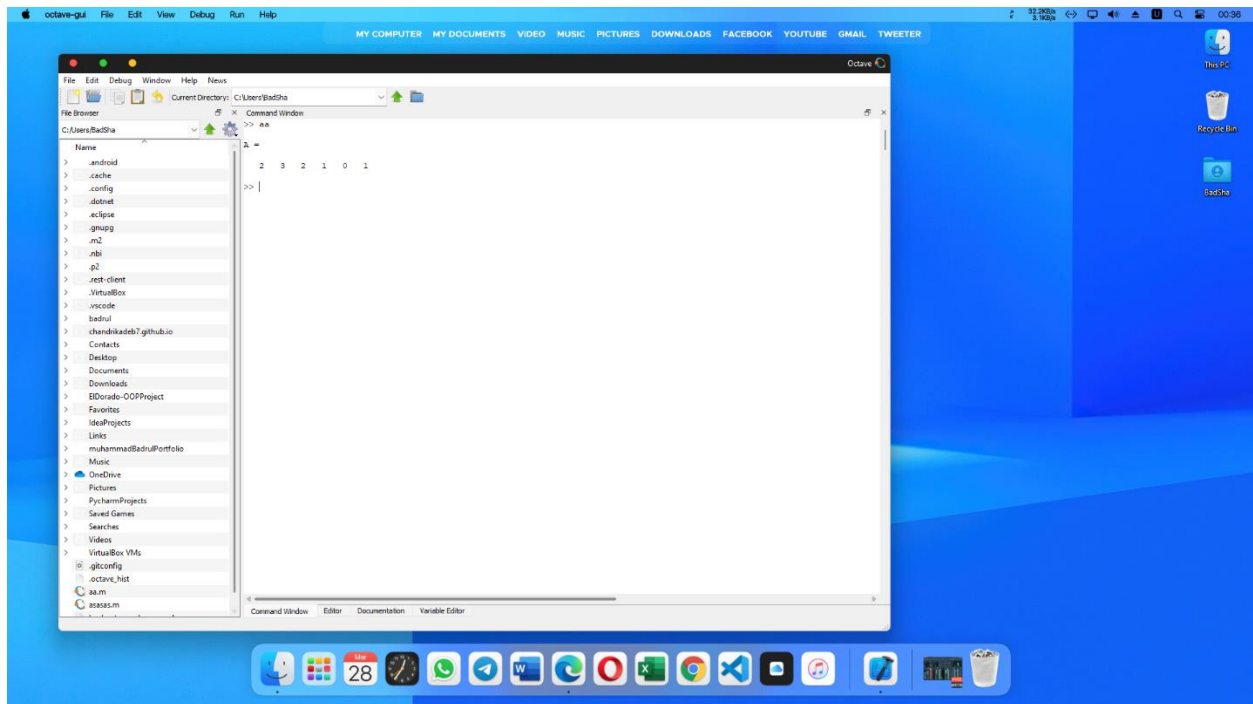


(d)

Code:



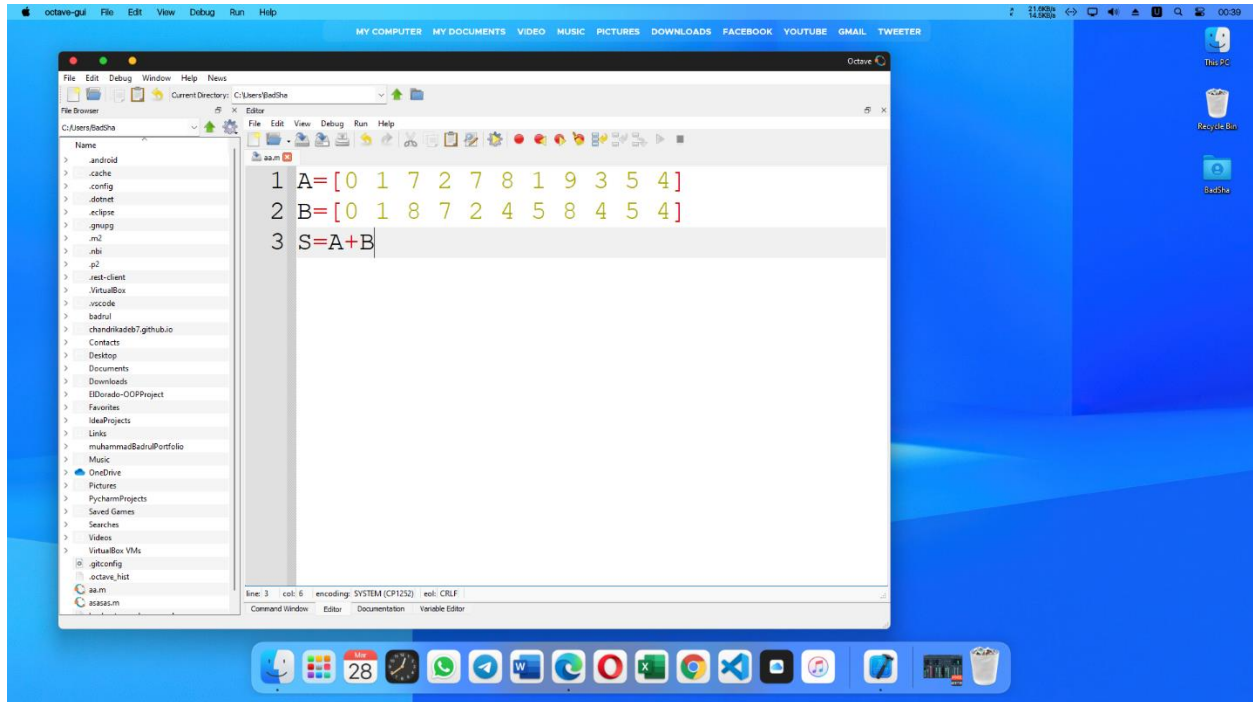
Output:



## Answer to the Question no 02

(a)

Code:

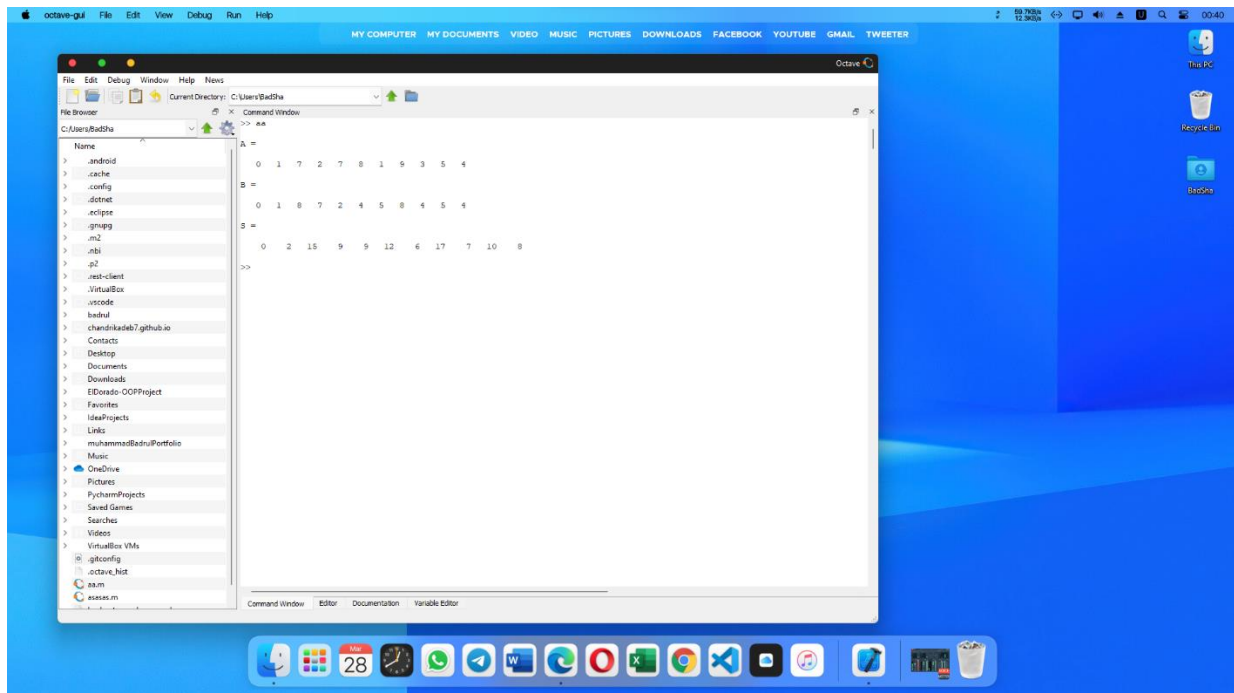


The screenshot shows the Octave GUI interface. The editor window contains the following code:

```
1 A=[0 1 7 2 7 8 1 9 3 5 4]
2 B=[0 1 8 7 2 4 5 8 4 5 4]
3 S=A+B
```

The status bar at the bottom indicates "line: 3 col: 6 encoding: SYSTEM (CP1252) | eol: CRLF". The file browser on the left shows the current directory as "C:\Users\Badsha".

Output:



The screenshot shows the Octave GUI interface with the Command Window open. The output of the code is displayed as follows:

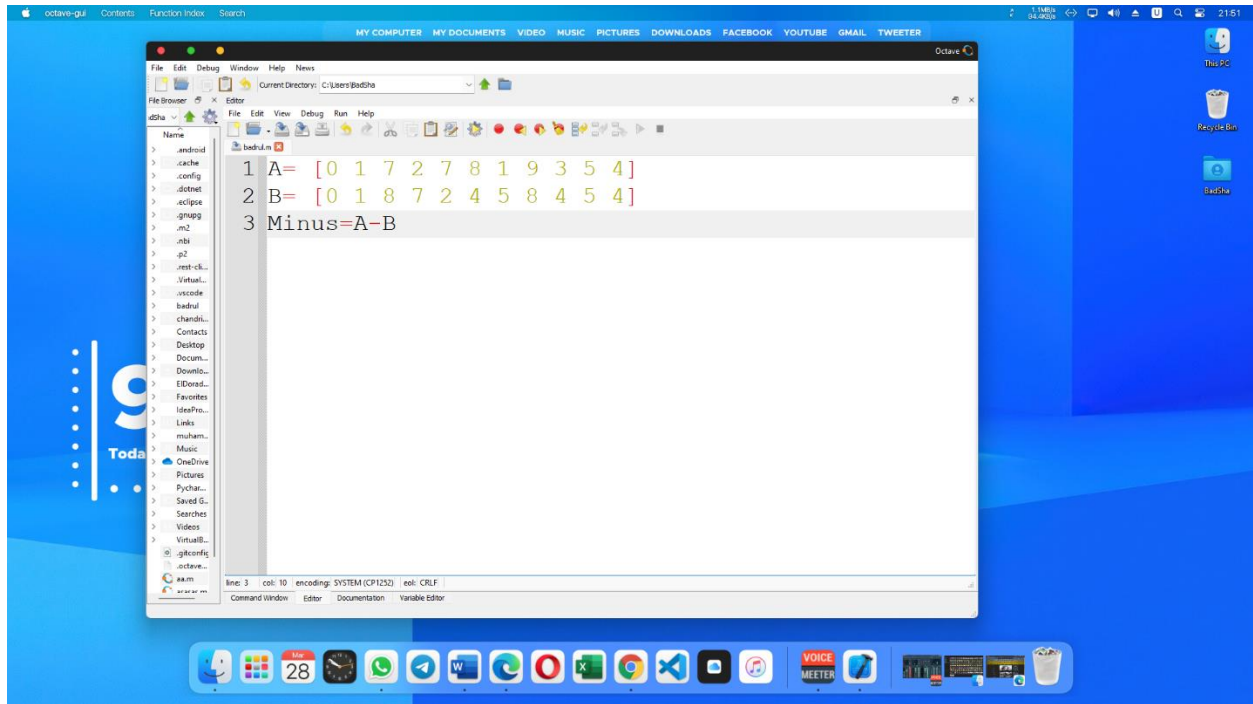
```
A =
  0 1 7 2 7 8 1 9 3 5 4
B =
  0 1 8 7 2 4 5 8 4 5 4
S =
  0 2 15 9 9 12 6 17 7 10 8
```

The status bar at the bottom indicates "Command Window Editor Documentation Variable Editor". The file browser on the left shows the current directory as "C:\Users\Badsha".



(b)

Code:

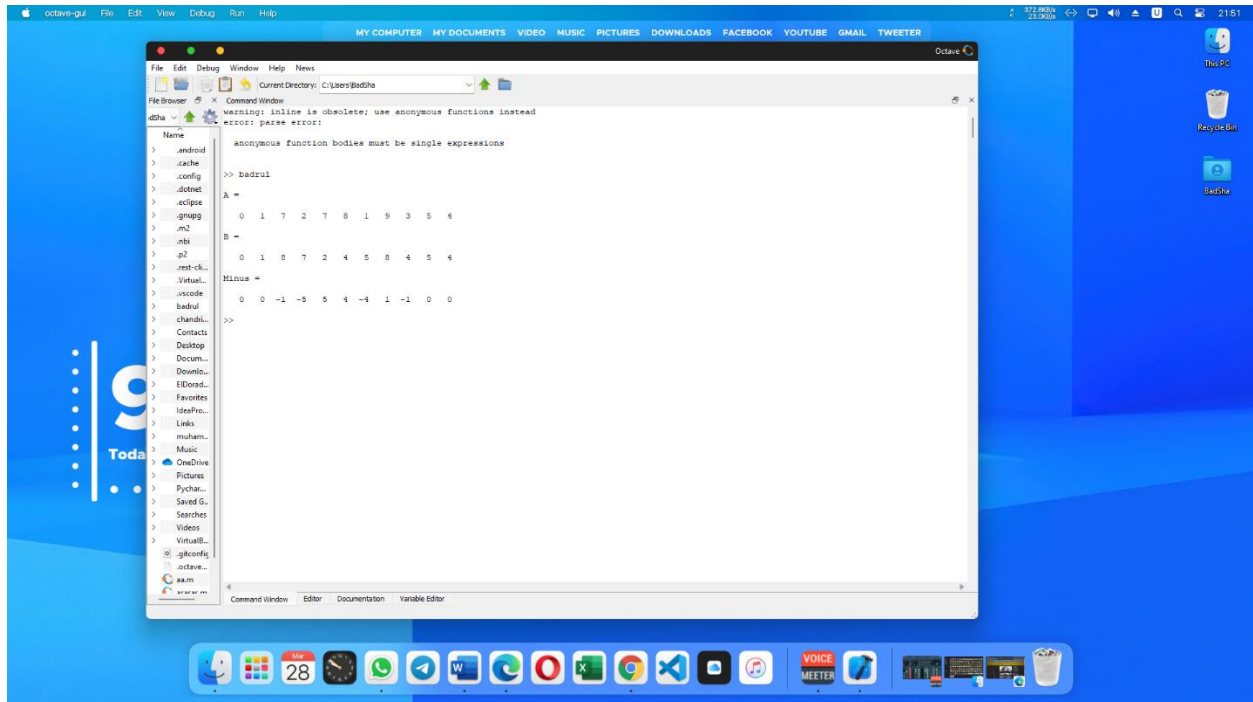


The screenshot shows the Octave GUI with a file editor window open. The code in the editor is as follows:

```
1 A= [0 1 7 2 7 8 1 9 3 5 4]
2 B= [0 1 8 7 2 4 5 8 4 5 4]
3 Minus=A-B
```

The status bar at the bottom of the editor window indicates: line: 3, col: 10, encoding: SYSTEM (CP1252), eol: CRLF.

Output:



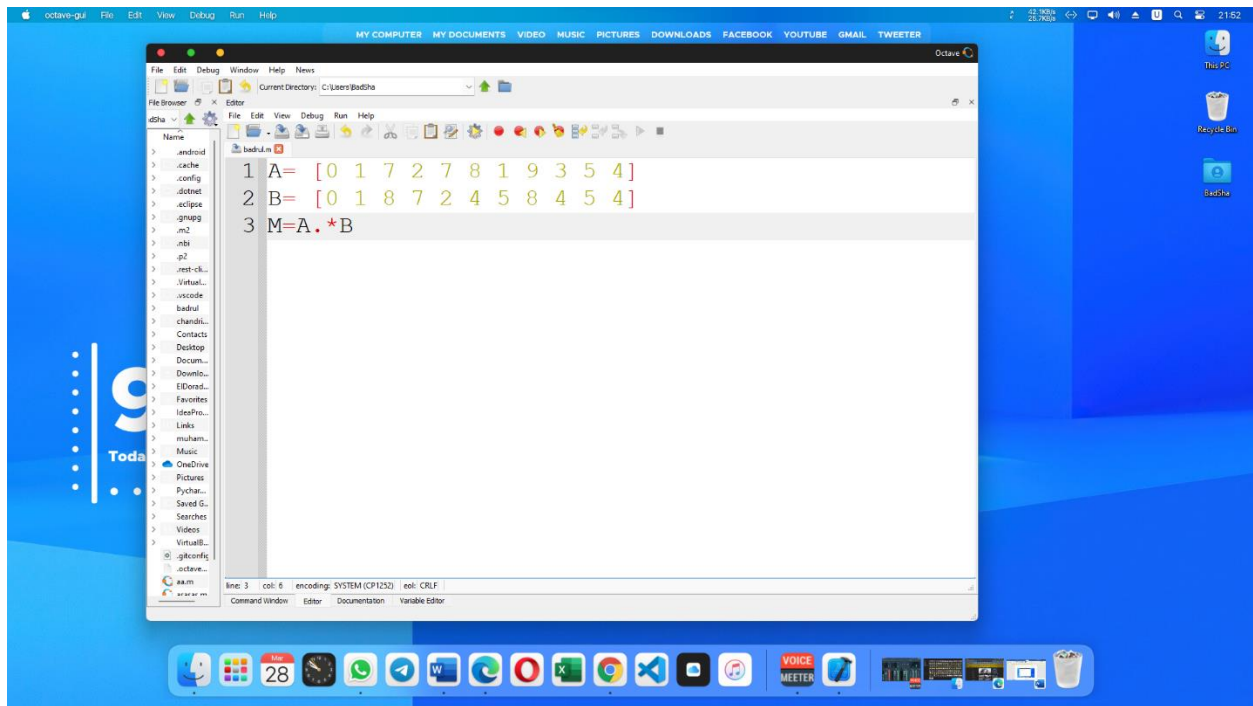
The screenshot shows the Octave GUI with the Command Window open. The output of the code is displayed as follows:

```
>> Badrul
A =
   0   1   7   2   7   8   1   9   3   5   4
B =
   0   1   8   7   2   4   5   8   4   5   4
Minus =
   0   0  -1  -5   5   4  -4   1  -1   0   0
```

The Command Window also shows a warning message: "warning: inline is obsolete; use anonymous functions instead" and an error message: "error: parse error: anonymous function bodies must be single expressions".

(c)

Code:

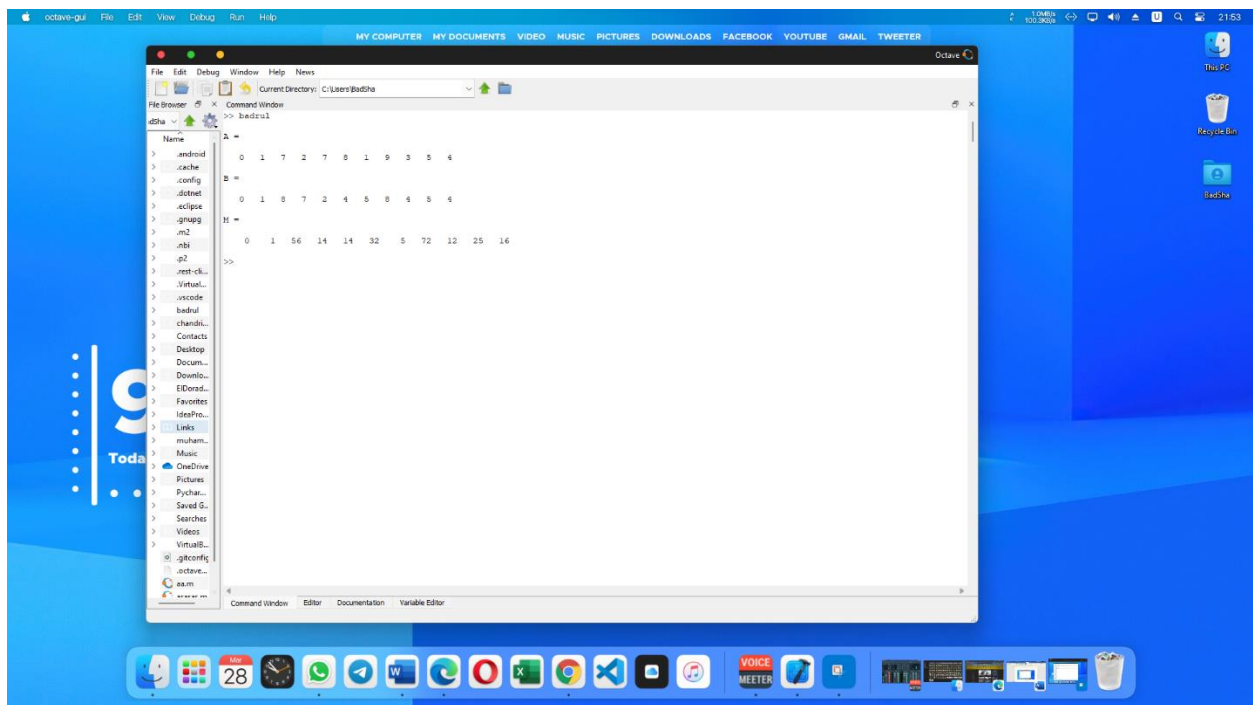


The screenshot shows the Octave GUI interface. The editor window contains the following code:

```
1 A= [0 1 7 2 7 8 1 9 3 5 4]  
2 B= [0 1 8 7 2 4 5 8 4 5 4]  
3 M=A.*B
```

The status bar at the bottom indicates "line: 3 col: 6 encoding: SYSTEM (CP1252) eol: CRLF". The desktop background is blue with a large '9' logo. The taskbar at the bottom shows various application icons including a calendar for the 28th, WhatsApp, Telegram, Word, Edge, and several other utilities.

Output:



The screenshot shows the Octave GUI interface after running the code. The Command Window displays the output of the matrix multiplication:

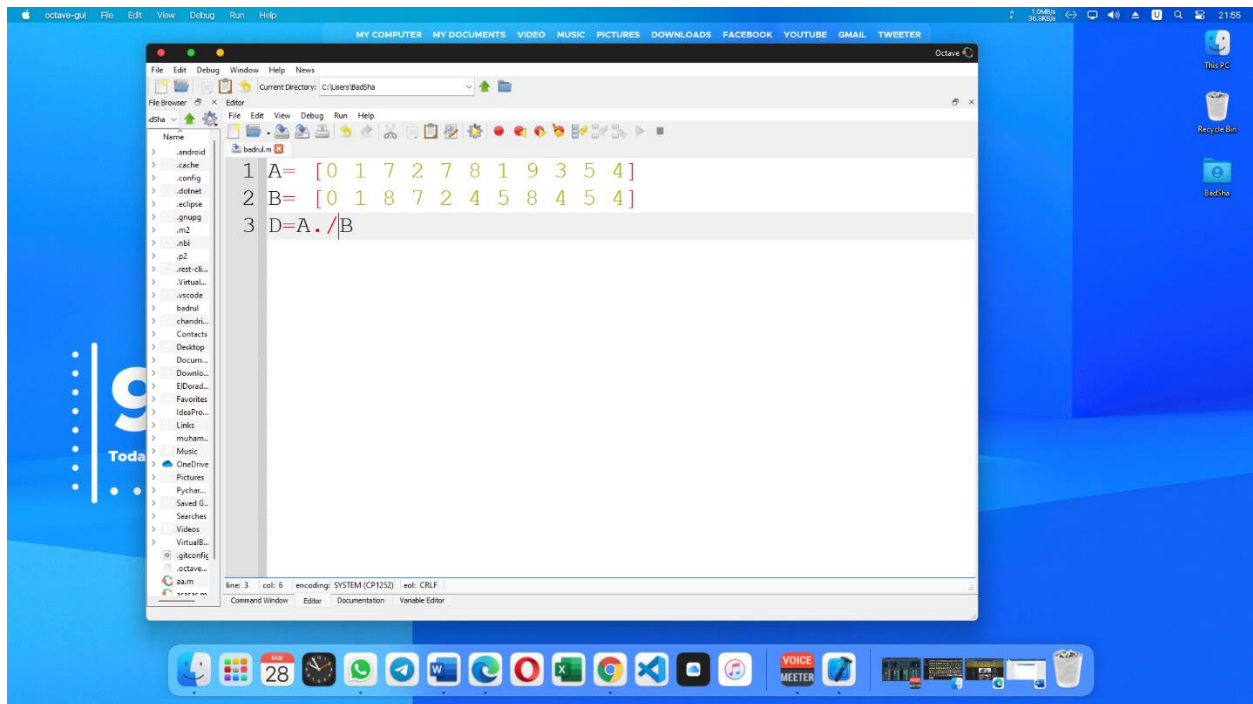
```
>> A =  
0 1 7 2 7 8 1 9 3 5 4  
B =  
0 1 8 7 2 4 5 8 4 5 4  
M =  
0 1 56 14 14 32 5 72 12 25 16  
>>
```

The status bar at the bottom indicates "line: 4 col: 1 encoding: SYSTEM (CP1252) eol: CRLF". The desktop background and taskbar are the same as in the previous screenshot.



(d)

Code:

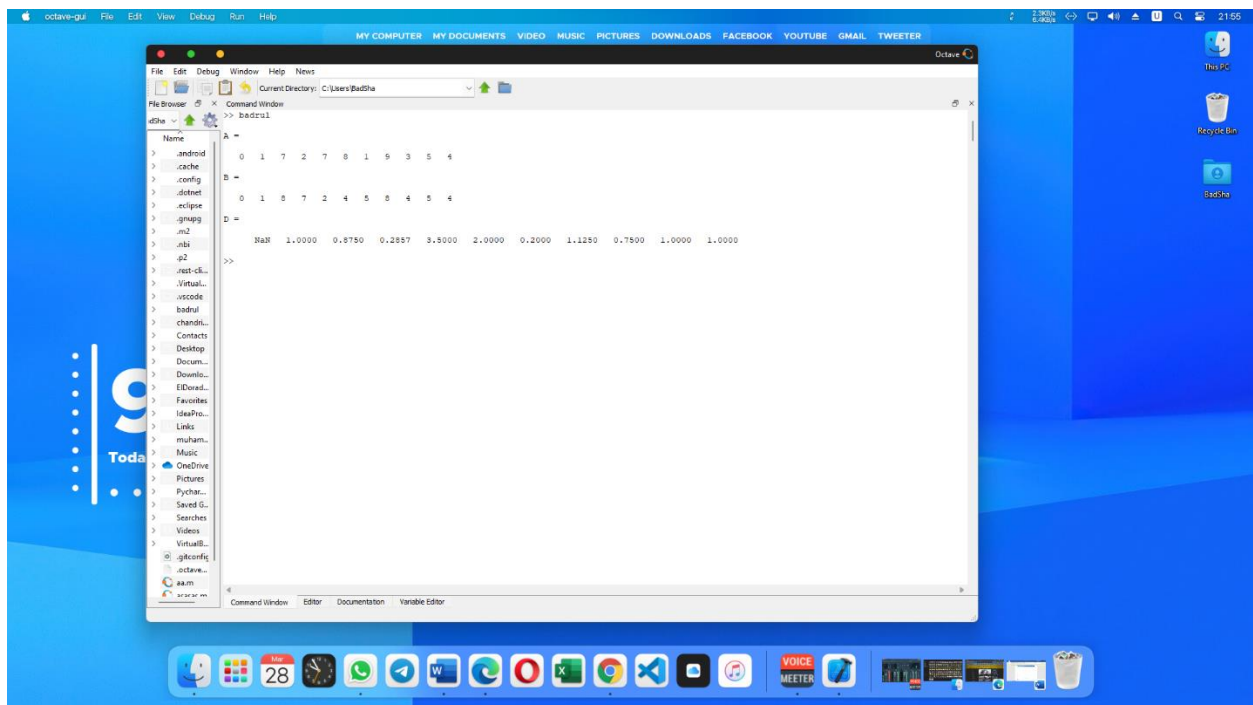


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [0 1 7 2 7 8 1 9 3 5 4]  
2 B= [0 1 8 7 2 4 5 8 4 5 4]  
3 D=A./B
```

The background is a blue desktop with various icons and a taskbar at the bottom.

Output:



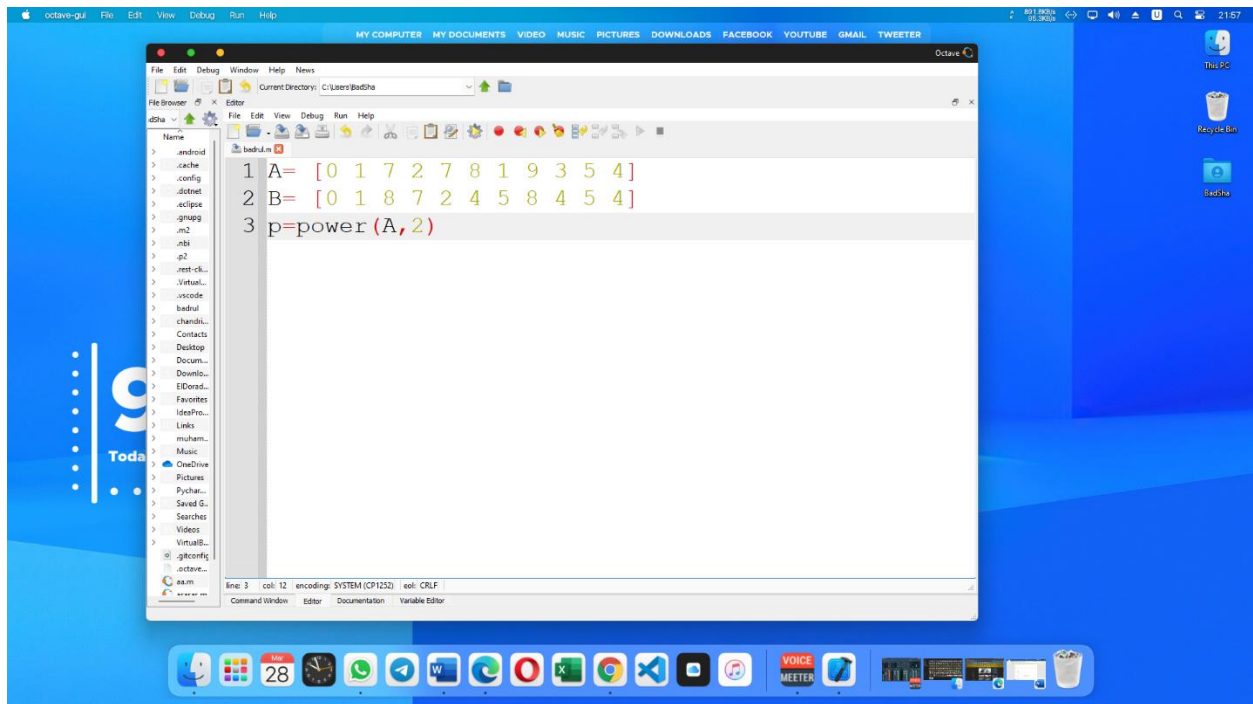
The screenshot shows the Octave GUI interface after running the code. The main editor window displays the output:

```
A =  
0 1 7 2 7 8 1 9 3 5 4  
B =  
0 1 8 7 2 4 5 8 4 5 4  
D =  
NaN 1.0000 0.8750 0.2857 3.5000 2.0000 0.2000 1.1250 0.7500 1.0000 1.0000
```

The background is the same blue desktop with various icons and a taskbar at the bottom.

(e)

Code:

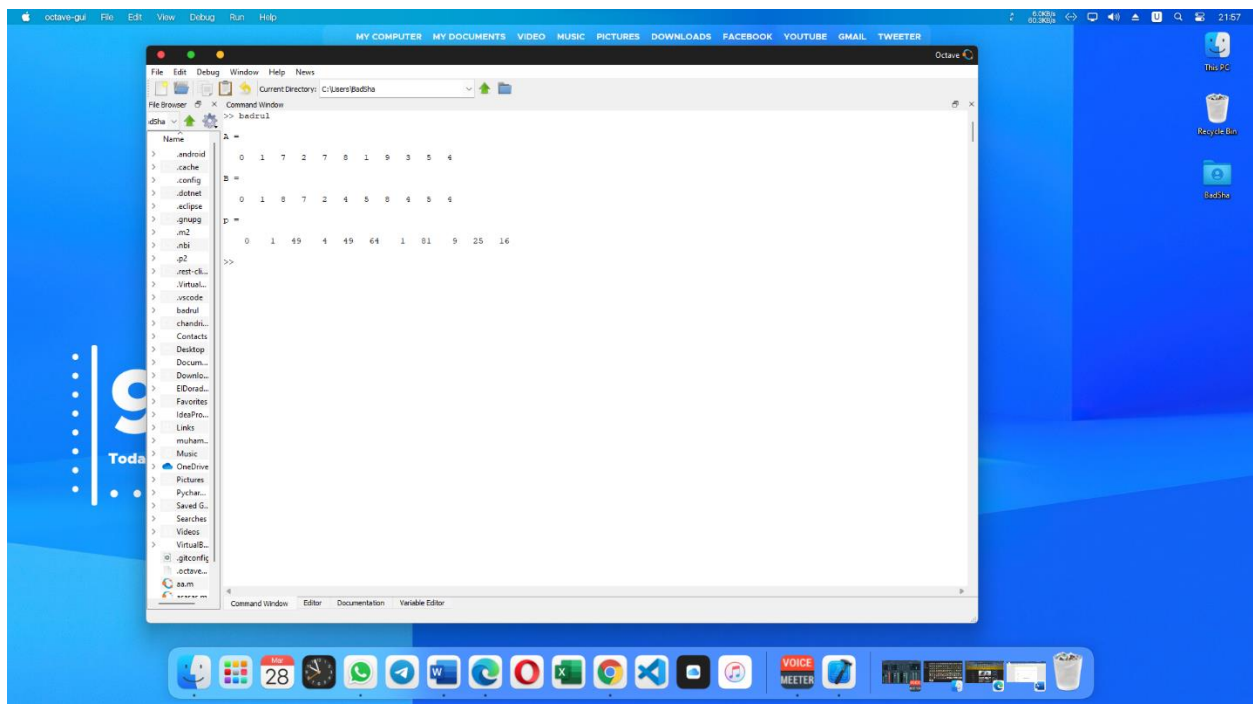


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [0 1 7 2 7 8 1 9 3 5 4]  
2 B= [0 1 8 7 2 4 5 8 4 5 4]  
3 p=power(A,2)
```

The status bar at the bottom indicates 'line: 3 col: 12 encoding: SYSTEM (CP1252) eol: CRLF'.

Output:



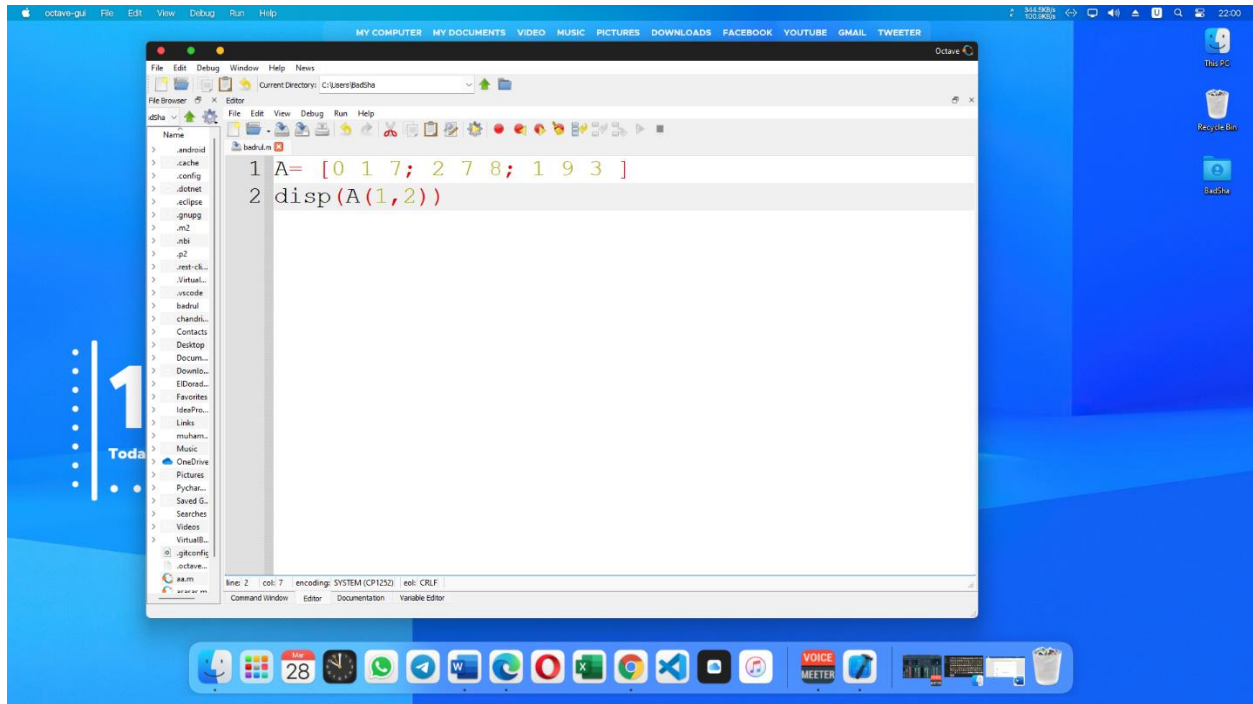
The screenshot shows the Octave GUI interface with the output of the code execution displayed in the Command Window. The output is as follows:

```
>> badru1  
A =  
  0  1  7  2  7  8  1  9  3  5  4  
B =  
  0  1  8  7  2  4  5  8  4  5  4  
p =  
  0  1  49  4  49  64  1  81  9  25  16  
>>
```

The status bar at the bottom indicates 'Command Window Editor Documentation Variable Editor'.

(f)

Code:

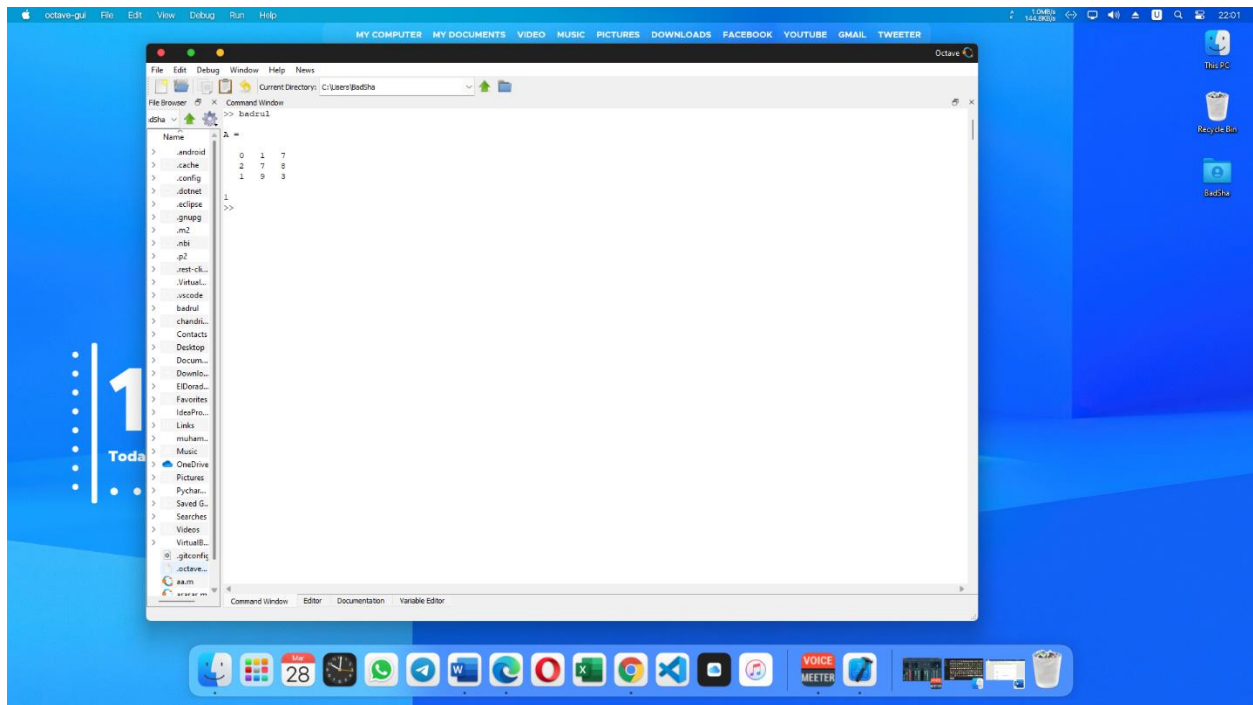


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [0 1 7; 2 7 8; 1 9 3 ]
2 disp(A(1,2))
```

The file browser on the left shows a directory structure with files like .android, .cache, .config, .dotnet, .eclipse, .gnupg, .m2, .nbi, .p2, .rest-cl..., .Virtual..., .vscode, .badrul, .chandri..., .Contacts, .Desktop, .Docum..., .Downlo..., .EIDonad..., .Favorites, .IdeaPro..., .Links, .muham..., .Music, .OneDrive, .Pictures, .Pychar..., .Saved G..., .Searches, .Videos, .VirtualB..., .gitconfi..., .octave..., and .as.m. The status bar at the bottom indicates 'line: 2 col: 7 encoding: SYSTEM (CP1252) eol: CRLF'.

Output:



The screenshot shows the Octave GUI interface after execution. The Command Window displays the output of the code:

```
>> A =
0 1 7
2 7 8
1 9 3

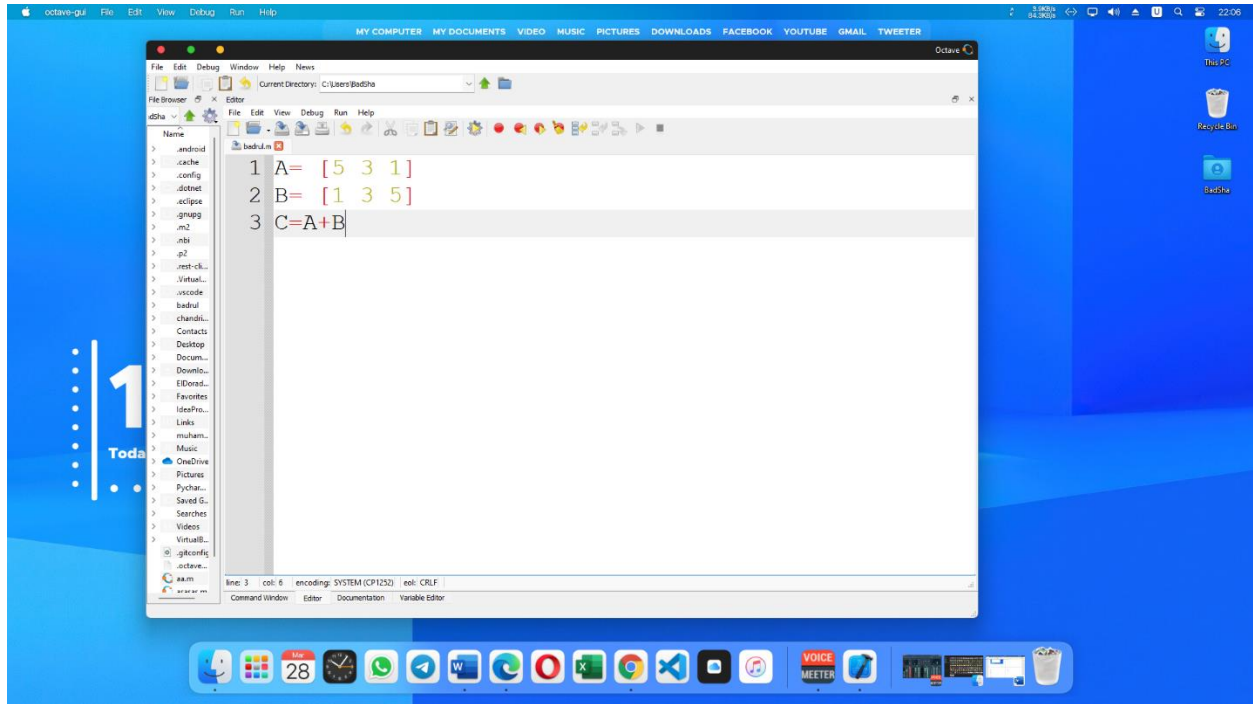
>>
1
>>
```

The file browser on the left shows the same directory structure as in the previous screenshot. The status bar at the bottom indicates 'line: 2 col: 7 encoding: SYSTEM (CP1252) eol: CRLF'.

## Answer to the Question no 03

**(a)**

*Code:*

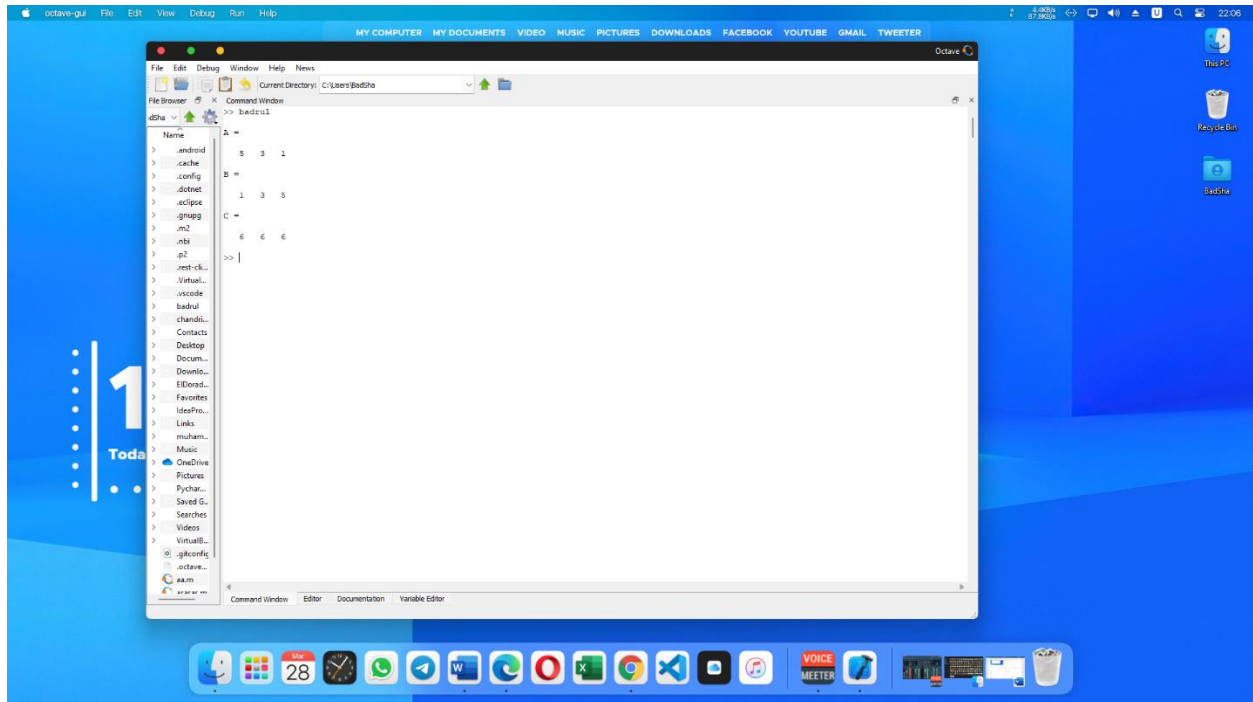


The screenshot shows the Octave GUI interface. The main editor window displays the following code:

```
1 A= [5 3 1]
2 B= [1 3 5]
3 C=A+B
```

The status bar at the bottom indicates 'line: 3 col: 6 encoding: SYSTEM (CP1252) eol: CRLF'.

*Output:*



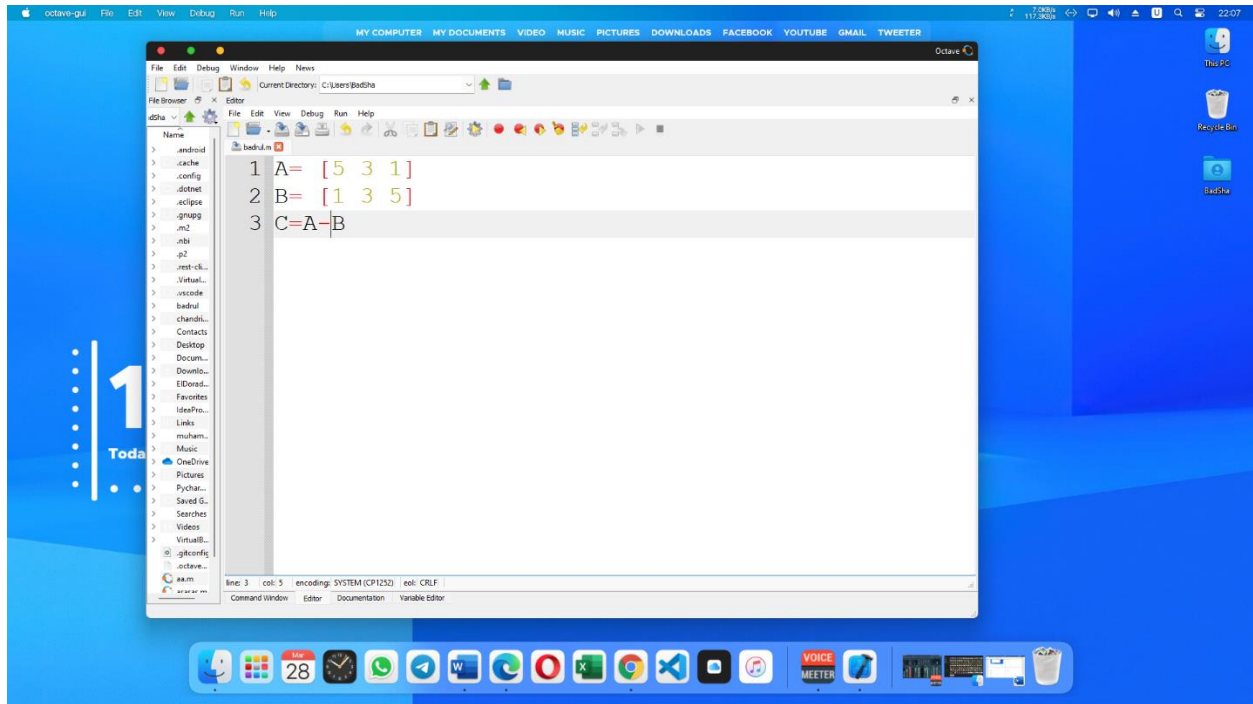
The screenshot shows the Octave GUI interface after execution. The Command Window displays the output:

```
A =
  5  3  1
B =
  1  3  5
C =
  6  6  6
>> |
```

The status bar at the bottom indicates 'line: 3 col: 6 encoding: SYSTEM (CP1252) eol: CRLF'.

**(b)**

*Code:*

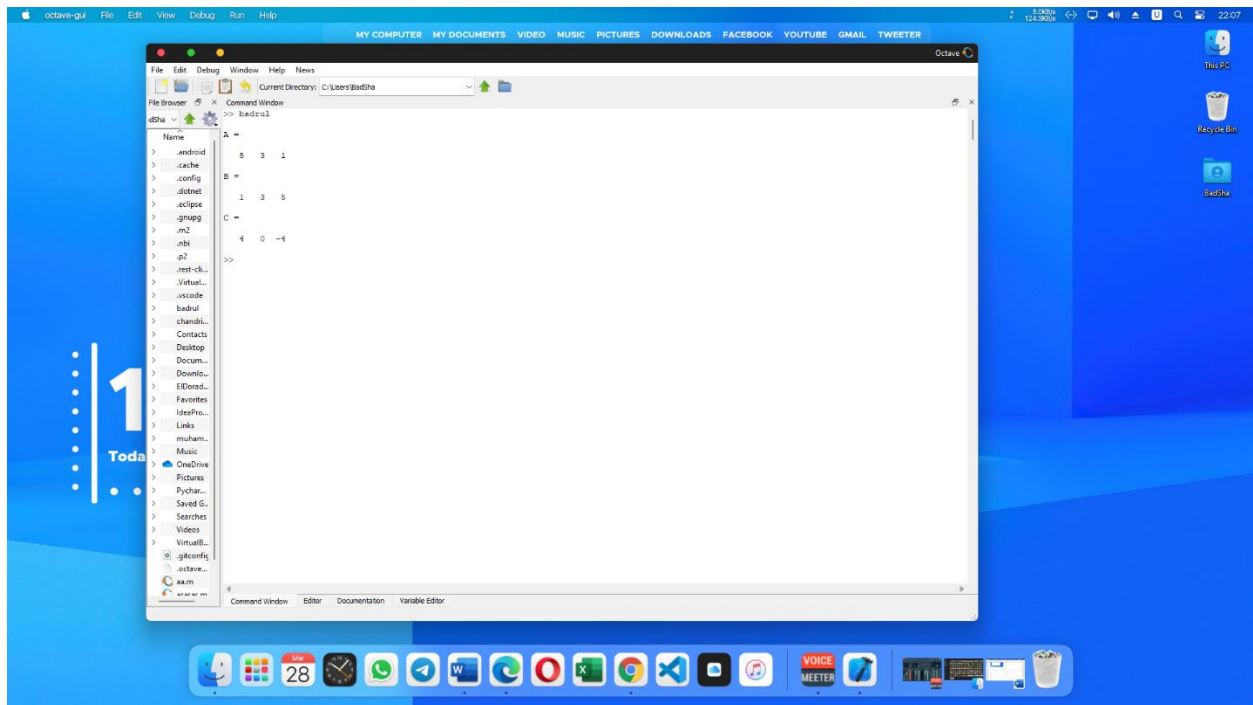


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [5 3 1]
2 B= [1 3 5]
3 C=A-B
```

The status bar at the bottom indicates the current line is 3, column is 5, and the encoding is SYSTEM (CP1252).

*Output:*



The screenshot shows the Octave GUI interface after execution. The Command Window displays the output of the code:

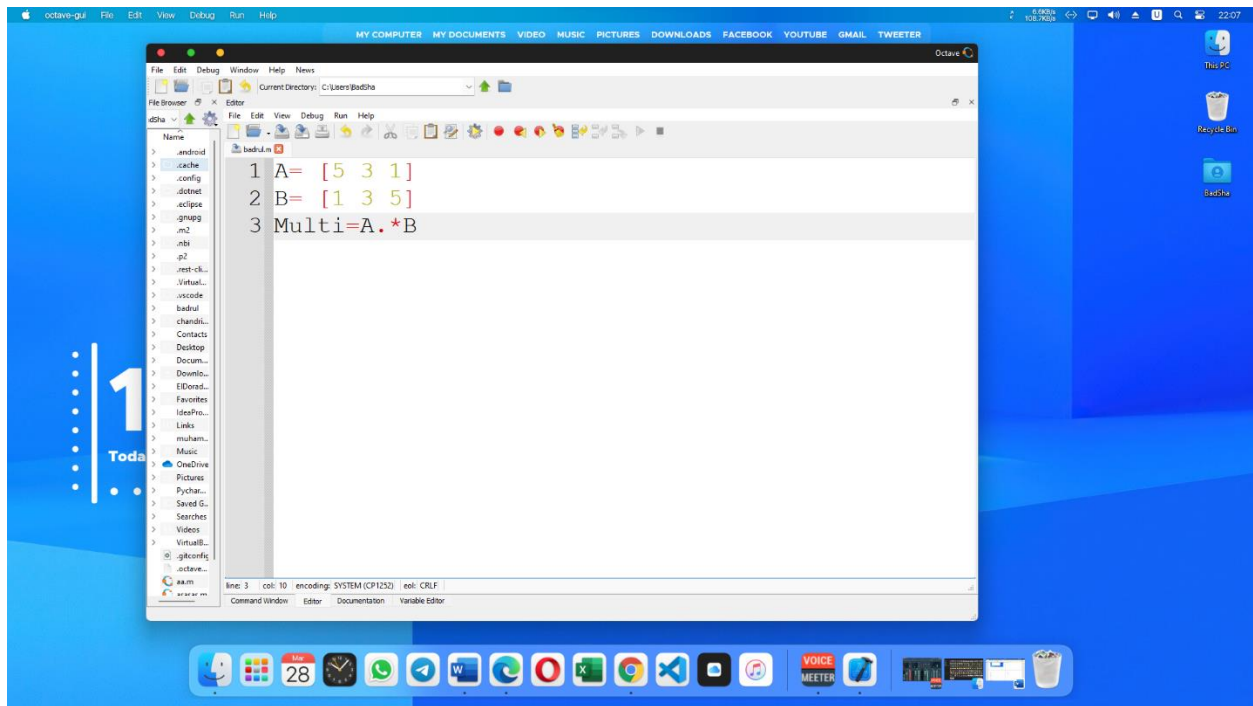
```
>> A =
      5      3      1
      B =
      1      3      5
      C =
      4      0     -4
>>
```

The status bar at the bottom indicates the current line is 4, column is 1, and the encoding is SYSTEM (CP1252).



(c)

Code:

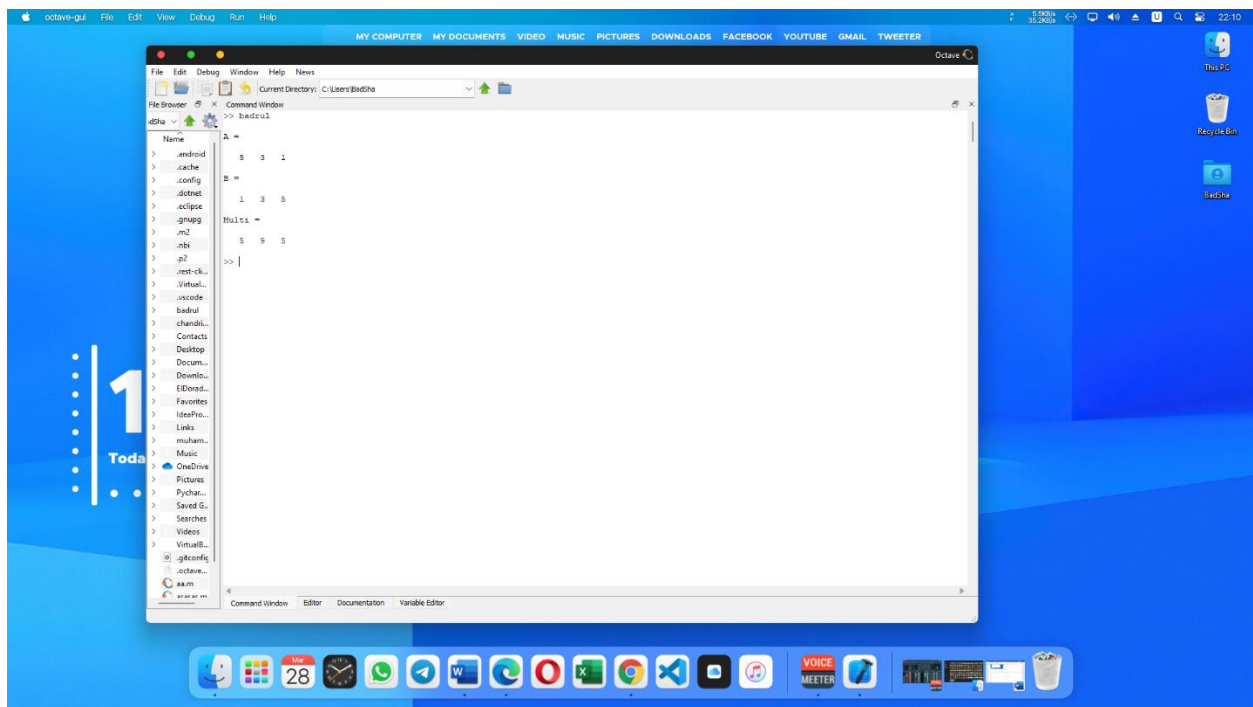


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [5 3 1]
2 B= [1 3 5]
3 Multi=A.*B
```

The status bar at the bottom indicates 'line: 3 col: 10 encoding: SYSTEM (CP1252) eol: CRLF'. The desktop background is blue with a '1 Today' widget on the left and a taskbar at the bottom with various application icons.

Output:



The screenshot shows the Octave GUI interface after execution. The Command Window displays the output of the code:

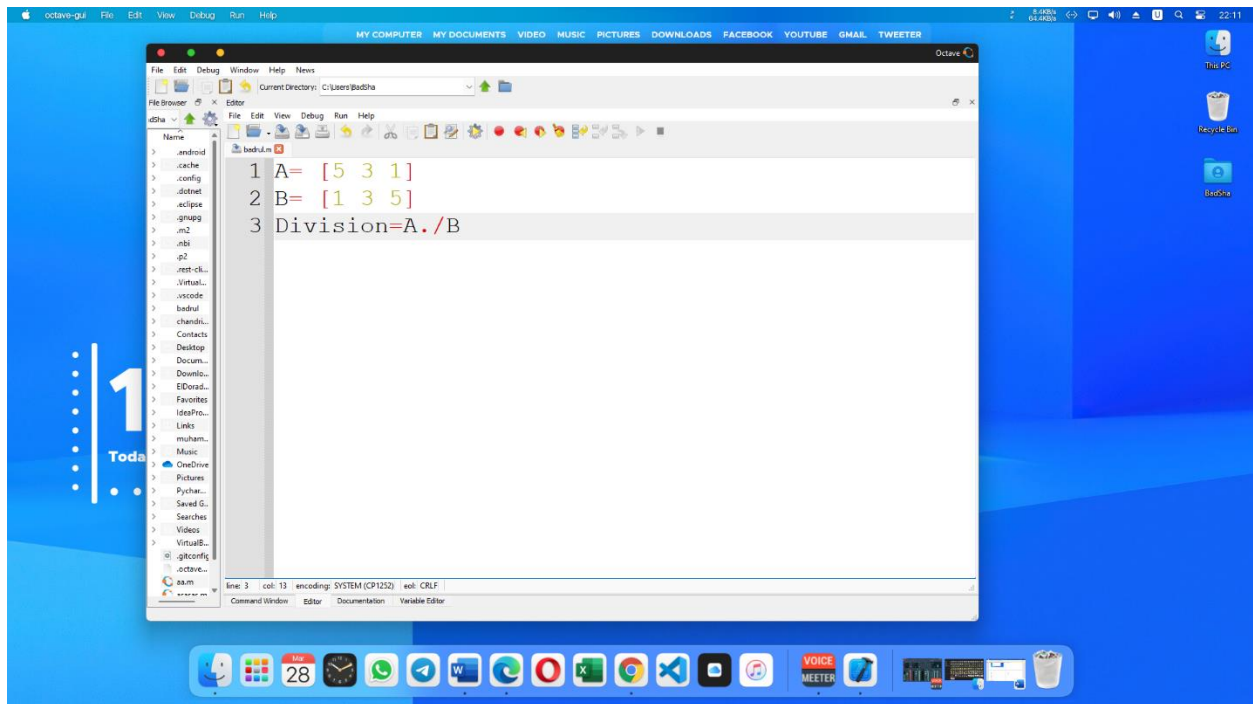
```
>> Multi
A =
     5     3     1
B =
     1     3     5
Multi =
     5     9     5
```

The status bar at the bottom indicates 'line: 3 col: 10 encoding: SYSTEM (CP1252) eol: CRLF'. The desktop background is blue with a '1 Today' widget on the left and a taskbar at the bottom with various application icons.



**(d)**

*Code:*

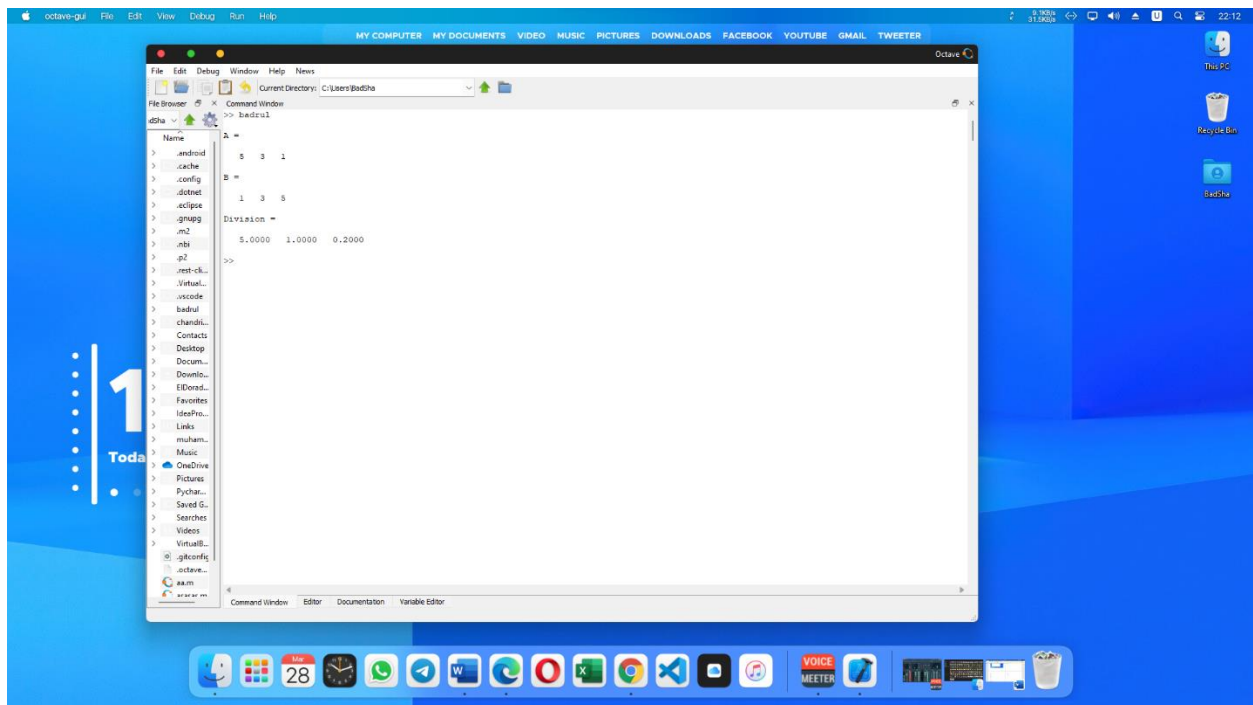


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [5 3 1]
2 B= [1 3 5]
3 Division=A./B
```

The status bar at the bottom indicates 'line: 3 col: 13 encoding: SYSTEM (CP1252) eol: CRLF'.

*Output:*



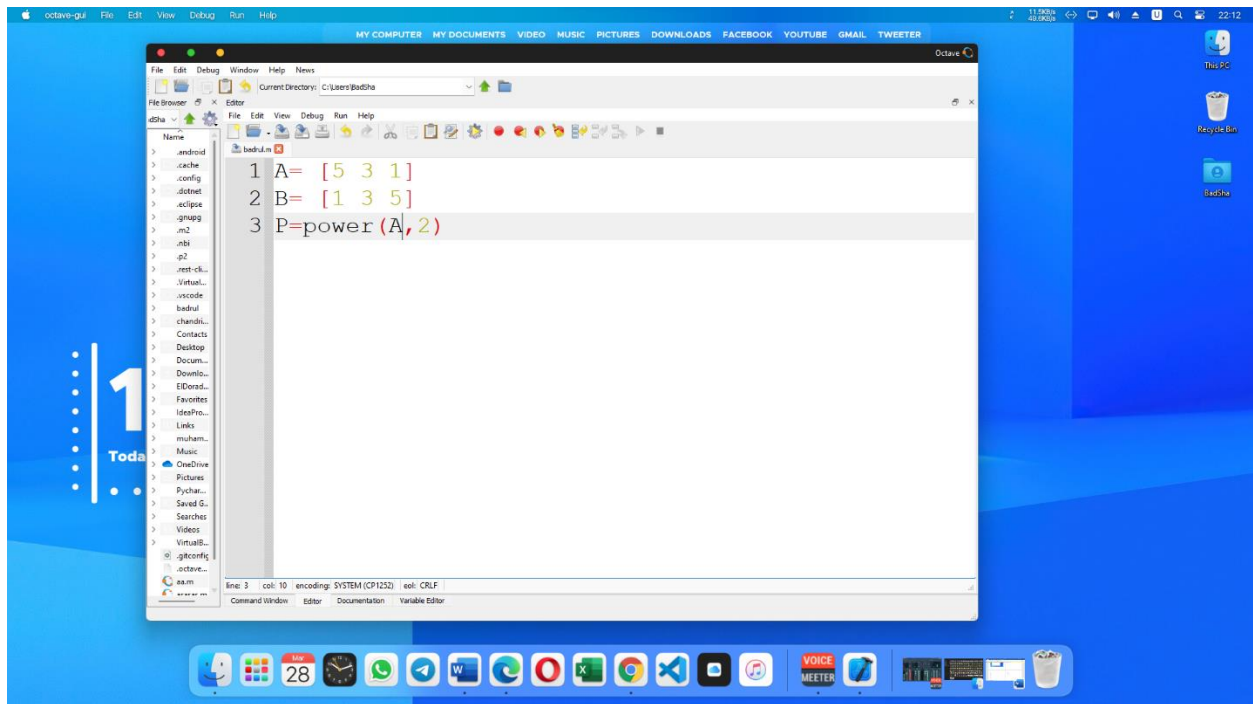
The screenshot shows the Octave GUI interface after execution. The Command Window displays the following output:

```
>> Badrul
A =
    5    3    1
B =
    1    3    5
Division =
    5.0000    1.0000    0.2000
>>
```

The status bar at the bottom indicates 'line: 4 col: 1 encoding: SYSTEM (CP1252) eol: CRLF'.

(e)

Code:

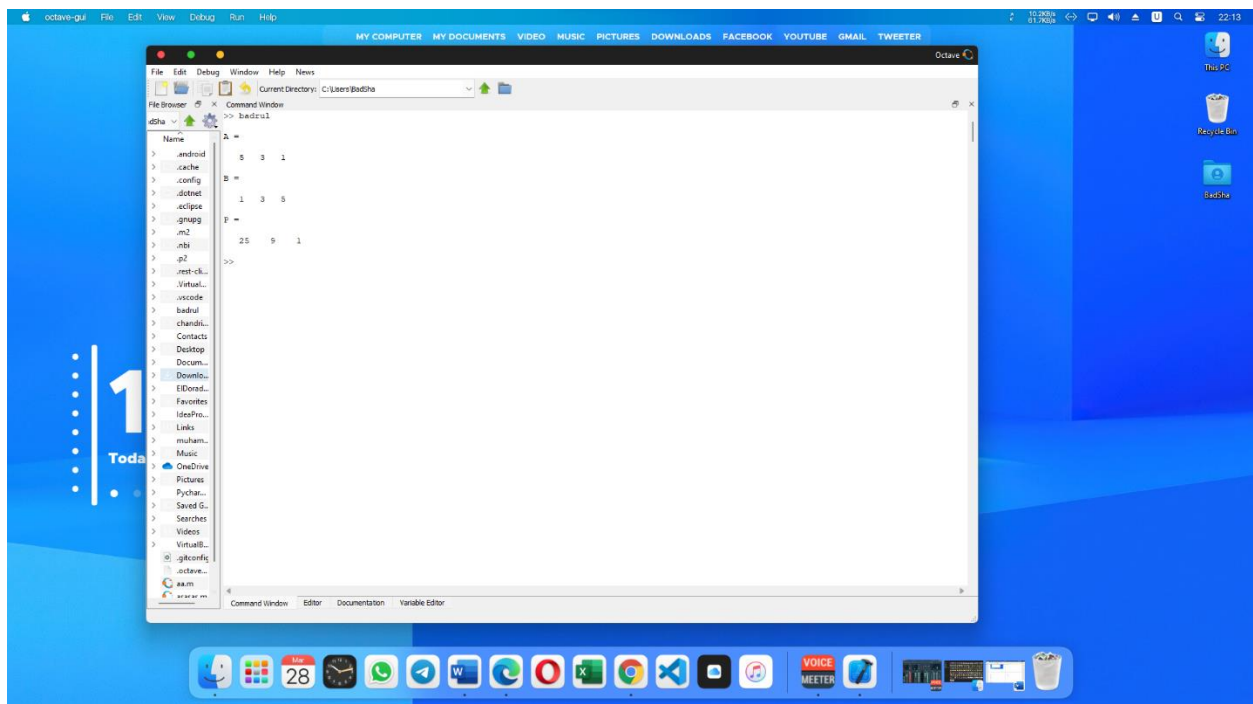


The screenshot shows the Octave GUI interface. The main editor window contains the following code:

```
1 A= [5 3 1]
2 B= [1 3 5]
3 P=power(A,2)
```

The status bar at the bottom indicates 'line: 3 col: 10 encoding: SYSTEM (CP1252) eol: CRLF'. The desktop background is blue with a '1 Today' widget on the left and icons for 'This PC', 'Recycle Bin', and 'badsha' on the right. The taskbar at the bottom shows various application icons including a calendar for the 28th.

Output:



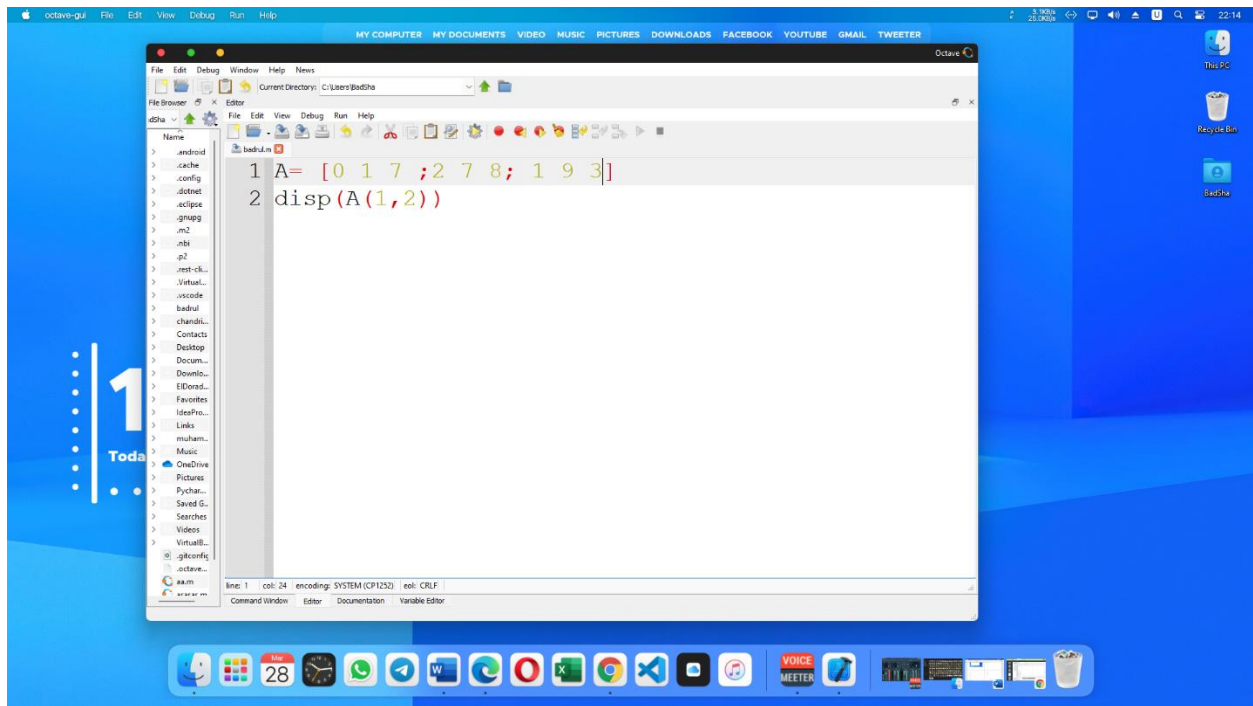
The screenshot shows the Octave GUI interface after running the code. The main editor window displays the output of the commands:

```
A =
     5     3     1
B =
     1     3     5
P =
    25     9     1
```

The status bar at the bottom indicates 'line: 4 col: 1 encoding: SYSTEM (CP1252) eol: CRLF'. The desktop background and taskbar are the same as in the previous screenshot.

(f)

Code:

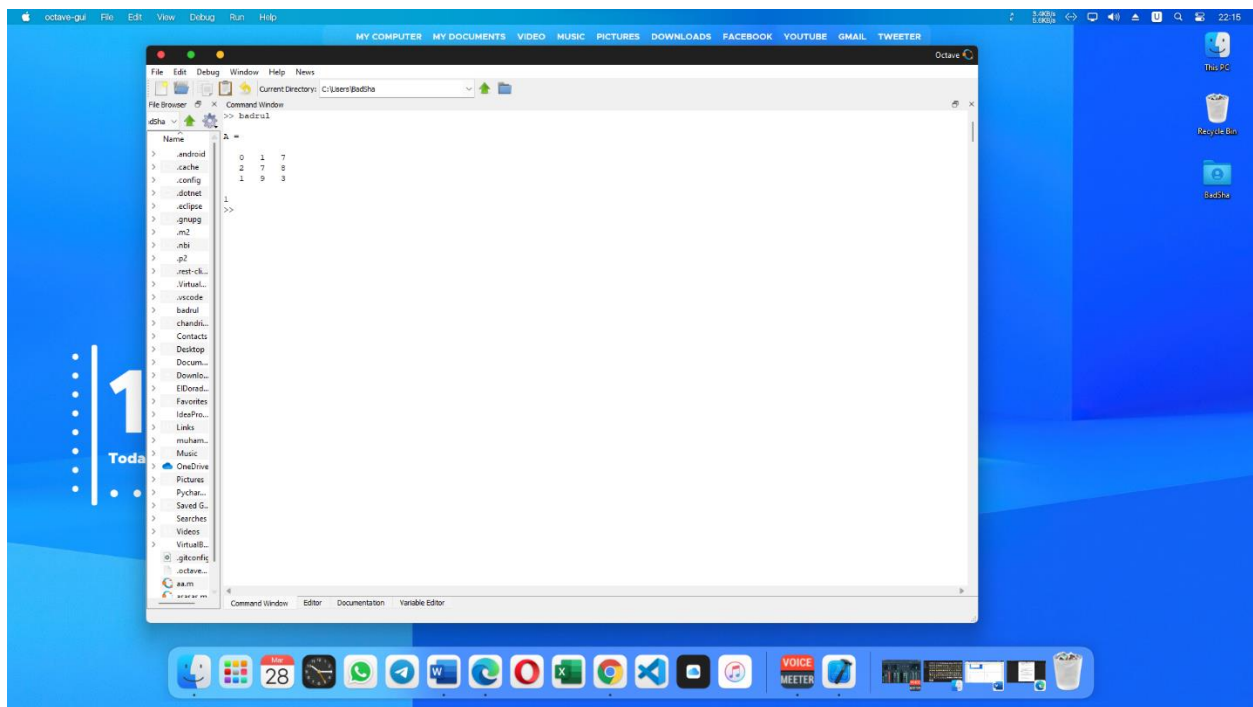


The screenshot shows the Octave GUI with the following code entered in the editor:

```
1 A= [0 1 7 ; 2 7 8 ; 1 9 3]  
2 disp(A(1,2))
```

The status bar at the bottom indicates: line: 1 col: 24 encoding: SYSTEM (CP1252) eol: CRLF.

Output:



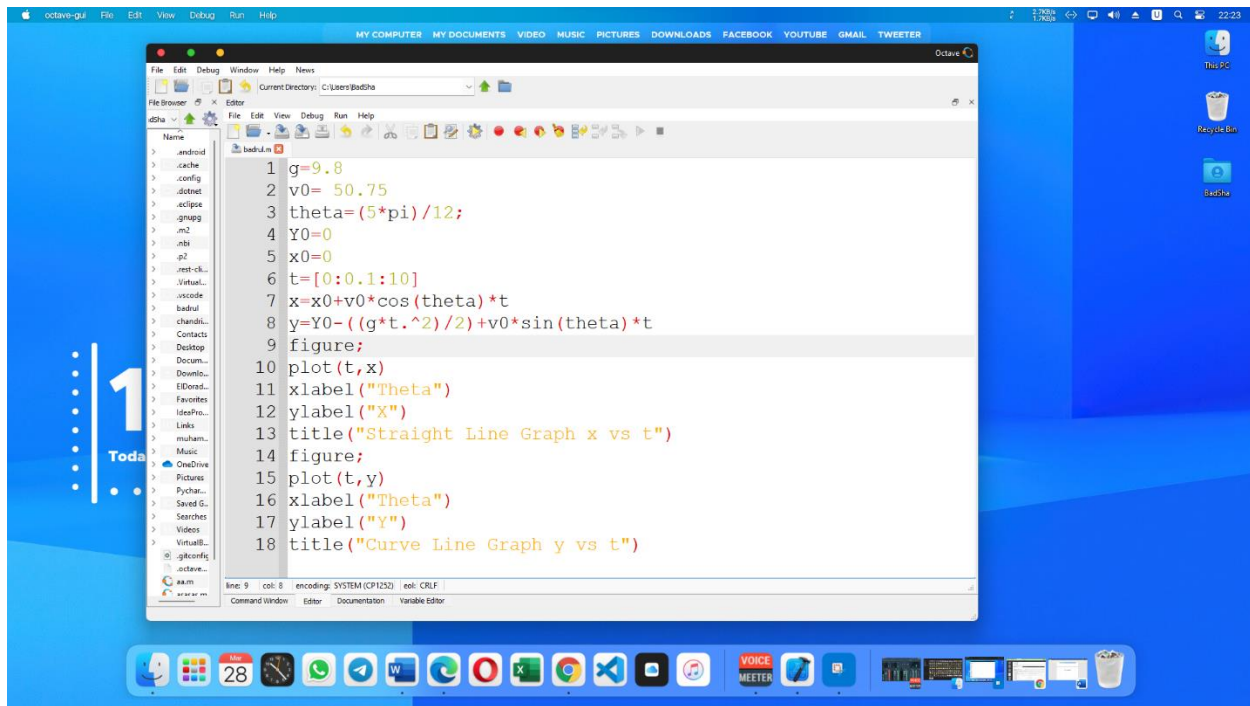
The screenshot shows the Octave GUI with the output of the code displayed in the Command Window:

```
>> A =  
    0     1     7  
    2     7     8  
    1     9     3  
  
>>  
1  
>>
```

The status bar at the bottom indicates: Command Window Editor Documentation Variable Editor.

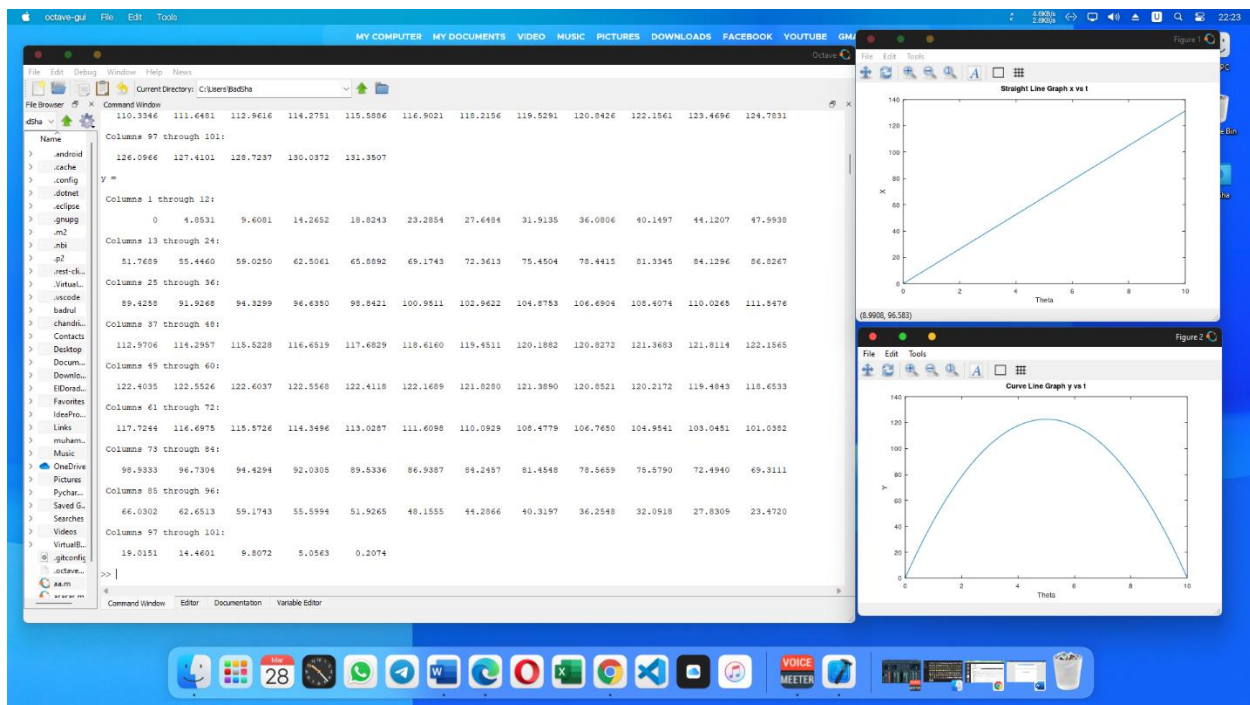
## Answer to the Question no 04

Code:



```
1 g=9.8
2 v0= 50.75
3 theta=(5*pi)/12;
4 Y0=0
5 x0=0
6 t=[0:0.1:10]
7 x=x0+v0*cos(theta)*t
8 y=Y0-((g*t.^2)/2)+v0*sin(theta)*t
9 figure;
10 plot(t,x)
11 xlabel("Theta")
12 ylabel("X")
13 title("Straight Line Graph x vs t")
14 figure;
15 plot(t,y)
16 xlabel("Theta")
17 ylabel("Y")
18 title("Curve Line Graph y vs t")
```

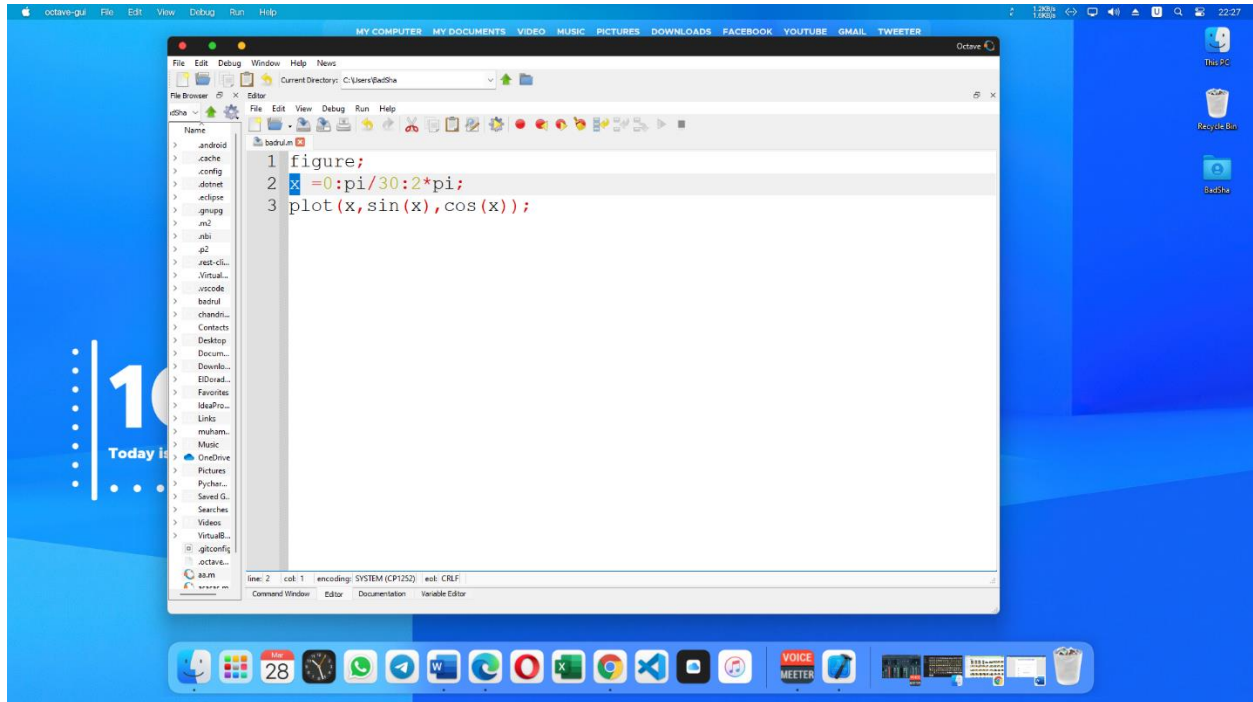
Output:



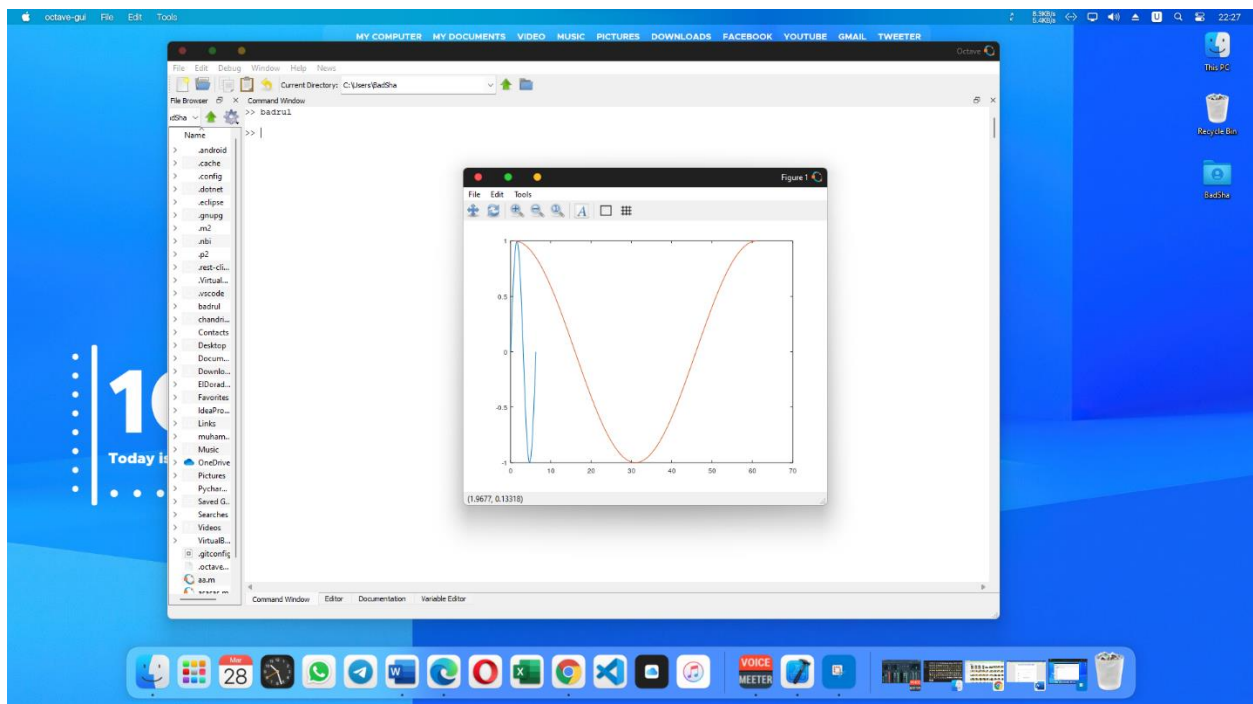
## Answer to the Question no 05

(a)

Code:



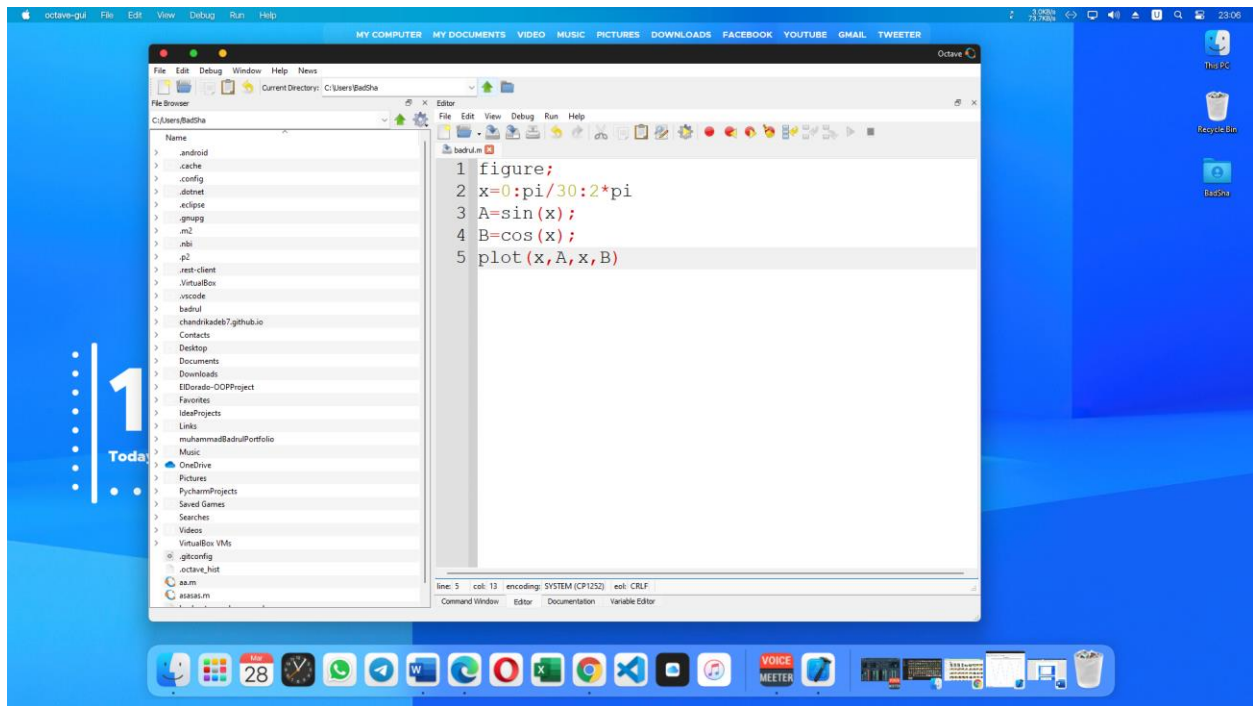
Output:



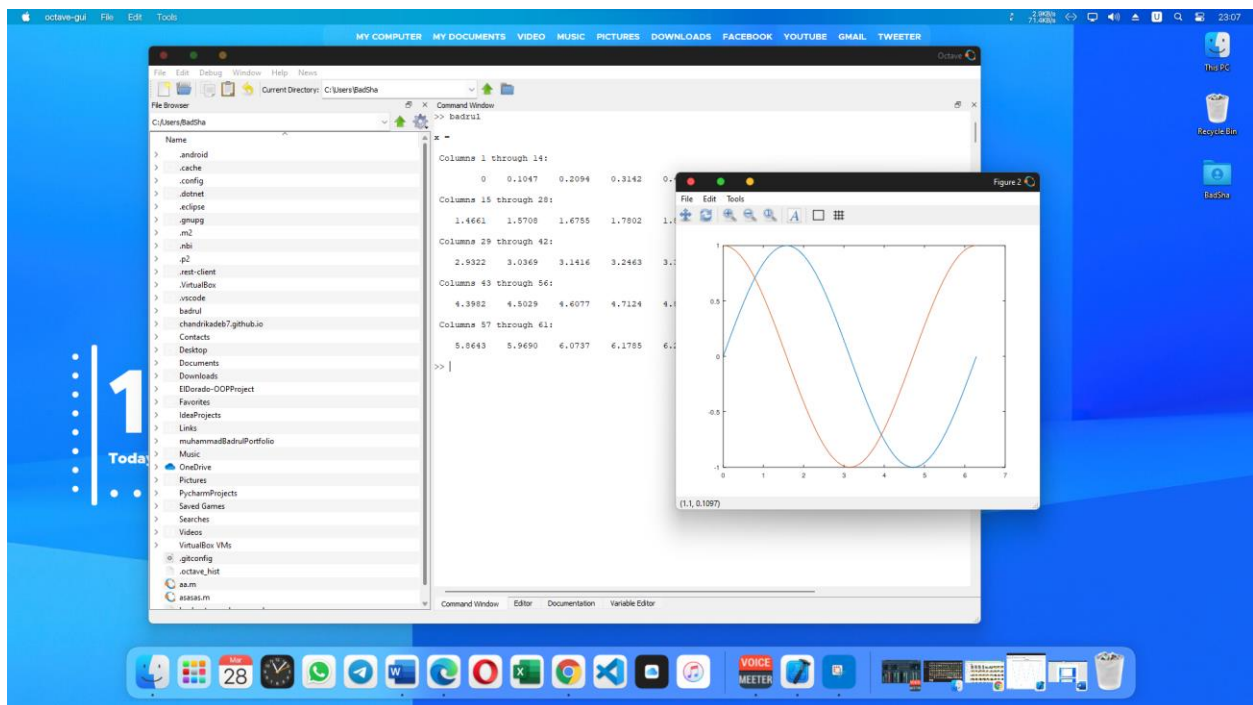


**(b)**

*Code:*



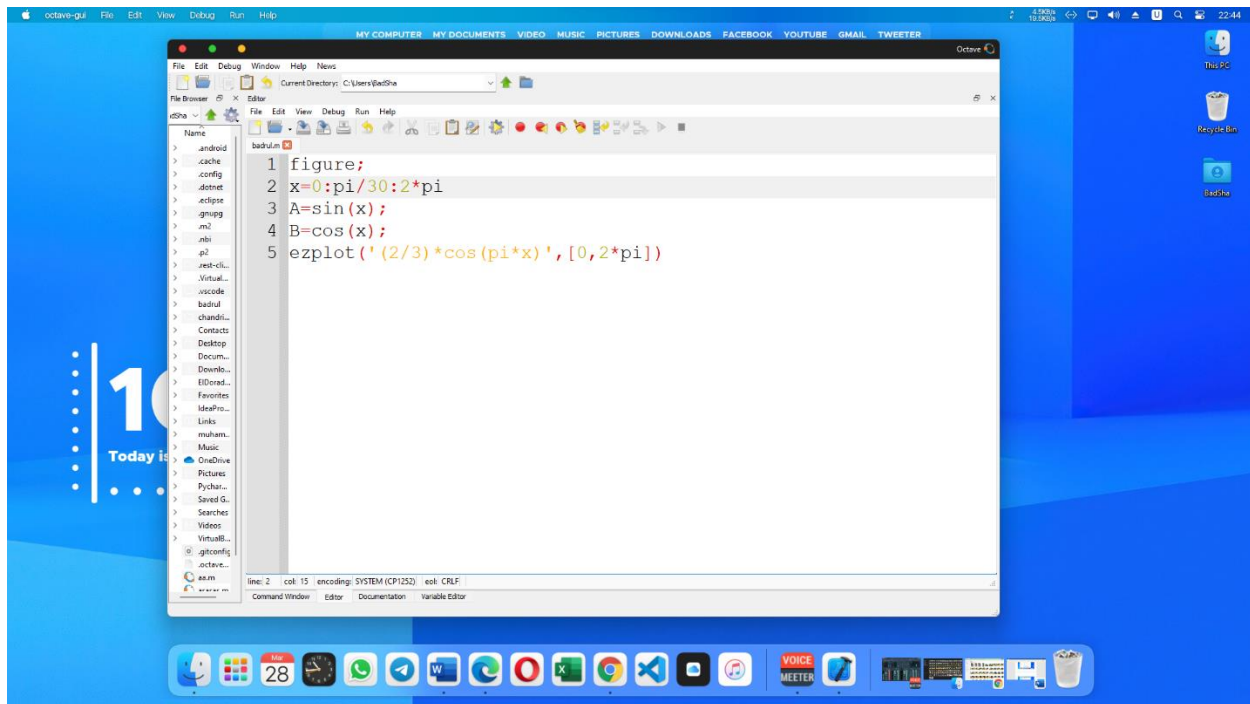
*Output:*





(c)

Code:



Output:

