Lab03 – AdvancedSelection and FormattedOutput

1. The command shown below will produce what output?

   fprintf('The value of 1/pi = %4.6f',1/pi) o The value of 1\3.14 = 0.318310

   Clearly circle only one answer.
   - 0.318310
   - The value of 1/pi = 0.318310
   - The value of 0.3183= %4.2f
   - Invalid syntax
2. The command shown below will produce what output?

   fprintf('Pi to 4 decimals is %6.4f \n 22/7 is %6.4f',pi,22/7)

   Clearly circle only one answer.
   - Pi to 4 decimals is 3.14 is 22/7
   - Pi to 4 decimals is 3.1416 22/7 is 3.1429
   - Pi to 4 decimals is 3.14 22/7 is 3.1429
   - Invalid syntax
3. The command shown below will produce what output?

   fprintf('max temp is %.2f degree',100.2347)

   Clearly circle only one answer.
   - 'max temp is %.2f degree',100.2347
   - max temp is %.2f degree 100.2347
   - max temp is 100.2 degree o max temp is 100.23 degree
   - Invalid syntax
4. In order to print formatted integers with the following format,

   998
   999
   1000
   1001

   ```
   for  i = 998 : 1001
       fprintf(…);
   end
   ```

   Which fprintf statement should be used in the above code (on the right hand side)?

   Clearly circle only one answer.
   - fprintf('%d\n', i)
   - fprintf('%5d\n', i)
   - fprintf('%05d', i)
   - fprintf('%5.5d\n', i)
   - None of the above

5. Write a program to read an array of integers to print the range of odd and even numbers.

   I/O Example

   Enter an array: [1 2 9 4 5 6 7 10 3 8]

Even range from 2 to 10
Odd range from 1 to 9

6. Write a program to convert the distance from mm, m, km to cm upon the user choice. If the user enters a negative number, the program prints an error message (Invalid distance). If the user enters a wrong selection, the program prints an error message (Invalid unit).

I/O Example
Enter distance: -50
Invalid distance

I/O Example
Enter distance: 50
Enter distance unit (1 for mm, 2 for m, 3 for km): 4
Invalid unit

I/O Example
Enter distance: 50
Enter distance unit (1 for mm, 2 for m, 3 for km): 1
Converting from mm to cm
50 mm = 5.00 cm

I/O Example
Enter distance: 50
Enter distance unit (1 for mm, 2 for m, 3 for km): 2
Converting from m to cm
50 m = 5000.00 cm

I/O Example
Enter distance: 50
Enter distance unit (1 for mm, 2 for m, 3 for km): 3
Converting from km to cm
50 km = 5000000.00 cm

7. Write a program to read an array of patient's systolic blood pressure from the user and computes the number of LBP patients, IBP patients, PHBP patients...etc. according to the shown rules below. Results should be stored in an array.
   HBP (for blood pressure ≥ 140),
   PHBP (for 140 > blood pressure ≥ 120),
   IBP (for 120 > blood pressure ≥ 90),
   LBP (for 90 > blood pressure ≥ 70).

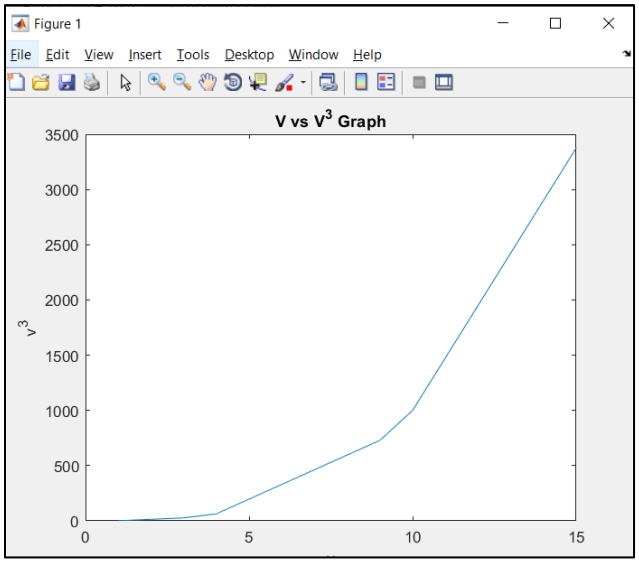
   I/O Example
   Please input blood pressure array: [78 115 140 170 80 180 90]
   HBP = 3
   PHBP = 0
   IBP = 2
   LBP = 2
   Output in an array: [3 0 2 2]

Lab03 – AdvancedSelection and FormattedOutput

8. Write a program that reads vector A from the user, computes the cubic values of A's elements and plot the results using the MATLAB function plot. Store the generated vector and corresponding cubic values in a tabular form in a file.

I/O Example

```
Enter a vector: [1 3 4 9 10 15]
Element    Element^3
1          1
3          27
4          64
9          729
10         1000
15         3375
```



9. Write a program that reads a number n from the user and print the following table (ex. n=7)

I/O Example

```
Enter N: 7
N          N^2        N^3        N^4
1          1          1          1
3          9          27         81
5          25         125        625
7          49         343        2401
```

10. Write a program to calculate the volume of a pyramid, which is 1/3 * base * height, where the base is length * width. Prompt the user to enter values for the length, width, and height, and then calculate the volume of the pyramid. When the user enters each value, he or she will then also be prompted for 'i' for inches or 'c' for centimeters. (Note: 2.54 cm = 1 inch.) The script should print the volume in cubic inches with three decimal places. As an example, the input/output format will be:

I/O Example

This program will calculate the volume of a pyramid
Enter the length of the base: 50
Is that i or c? i

Enter the width of the base: 6
Is that i or c? c
Enter the height: 4
Is that i or c? i
The volume of the pyramid is 157.48 cubic inches

11. Write a program that reads an array of temperature values in Kelvin and compute the corresponding temperatures in Fahrenheit and Celsius. The program shows the results in a tabular format aligned left. The program prints number of Celsius Temperatures that exceed 220 deg and their index. The program should also ask the user to continue or not and according to the user decision the program re-ask the user to enter new inputs or to stop and say Good Bye!

$$F = \frac{9}{5}(K - 273.15) + 32$$
$$C = K - 273.15$$

I/O Example

Enter Kelvin temperatures: [500.45 514.27 517.39 490.62]
Num Kelvin Cel Fah
1 500.45 227.30 441.14
2 514.27 241.12 466.02
3 517.39 244.24 471.63
4 490.62 217.47 423.45
There are 3 Celsius temperatures more than 220: 1 2 3
Do you want to continue (y/n): y
Enter Kelvin temperatures: [555.13 499 380 360]
Num Kelvin Cel Fah
1 555.13 281.98 539.56
2 499.00 225.85 438.53
3 380.00 106.85 224.33
4 360.00 86.85 188.33
There are 2 Celsius temperatures more than 220: 1 2
Do you want to continue (y/n): n
Good Bye!

12. Write a program that is used to calculate the final grade of all students in the class (maximum 20 students/class). The program reads from the user the following:
    - Midterm1 grade
    - Midterm2 grade
    - Quiz mark
    - End of term exam

    The midterm1 & midterm2 scores are out of 20 each. The quiz mark is out of 15 and the end of term exam is out of 45. The program should calculate the GPA of all entered students with maximum number of 20 students. The program should only accept grades from zero to max grade of each exam. The input and output of the program should look like the shown example.

    I/O Example

```
Enter number of students :32
Error! number of students from 0 to 20. Re-enter
Enter number of students :-5
Error! number of students from 0 to 20. Re-enter
Enter number of students :3

---- student 1 grades ----
mid1 : 25
Error! Max midterm grade from 0 to 20. Re-enter
mid1 : 12
mid2 : -4
Error! Max midterm grade from 0 to 20. Re-enter
mid1 : 10
quiz: 20
Error! quiz grade from 0 to 15. Re-enter
quiz: 10
end of term exam: 50
Error! end of term exam grade from 0 to 45. Re-enter
end of term exam:35

---- student 2 grades ----
mid1 : 10
mid2 : 25
Error! Max midterm grade from 0 to 20. Re-enter
mid1 : 20
```

quiz: 15
end of term exam: 42

---- student 3 grades ----
mid1 : 20
mid2 : 15
quiz: 10
end of term exam: 45
Student 1 GPA : D
Student 2 GPA : B
Student 3 GPA : A
Good Bye!