Computer Engineering Department

TED University

TED UNIVERSITY

CMPE 252 C Programming, Spring 2023

HOMEWORK 1

31.03.2023, Friday

Due Date: 26.04.2023, Wednesday, 23:59

Important Notes:

- **This is individual work. No teamwork is allowed. Similarity check will be applied to submitted codes. Codes with high similarities ratios will be penalized with 0.**
- **For more input/outputs, you can check VPLs.**
- **To ask questions about this homework, use HW1 forum on the LMS Page. Questions related to this homework are not answered via e-mails.**

Q1 (30 points)

In this question you will calculate the total score of a football team. There are three states in total and they are Win (W) which gives 3 points, In a Draw (D), which gives 1 point and Lost (L) which gives no points.

Getting to know input file:

A sample input file (**team1.txt**) is given as follows:

5 WWLDDD

10 WWLLDDLL

3 LLDW

Each line contains team id and results of matches. There is only one white space between team id and results of matches. You should calculate the total points for each team.

Example Input and Output :

Enter txt file name: team1.txt //read user input There are 3 teams in total. Team 5: 9 Team 10: 8 Team 3: 4

Q2 (30 points)

You have the following formula for the non-negative numbers:

$$x_n = x_{n-1} * \ b + \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$X_0 = 10$. You should read the number a, b, c from the user and they are float.

Also, user enters range for x_n and you should print all x_n values within this range. You should print **two** digits after decimal point for the result of the above formula.

Example Input and Output:

```
Enter value of a:
4                                   //read user input
Enter value of b:
5                                   //read user input
Enter value of c:
1                                   //read user input
Enter minimum value of x_n:
3                                   //read user input
Enter maximum value of x_n:
6                                   //read user input
x_3:  1242.25
x_4: 6211.00
x_5: 31054.75
x_6: 155273.5
```

Q3 (40 Points)

You would like to find the area under the curve y = f(x) between the lines x = a and x = b . One way to approximate this area is to use line segments as approximations of small pieces of the curve and then to sum the areas of trapezoids created by drawing perpendiculars from the line segment endpoints to the x -axis, as shown in Figure 1. We will assume that f (x) is nonnegative over the interval [a , b]. The trapezoidal rule approximates this area T as

$$T = \frac{h}{2}\left(f(a) + f(b) + 2\sum_{i=1}^{n-1} f(x_i)\right)$$

for n subintervals of length h:

$$h = \frac{b-a}{n}$$

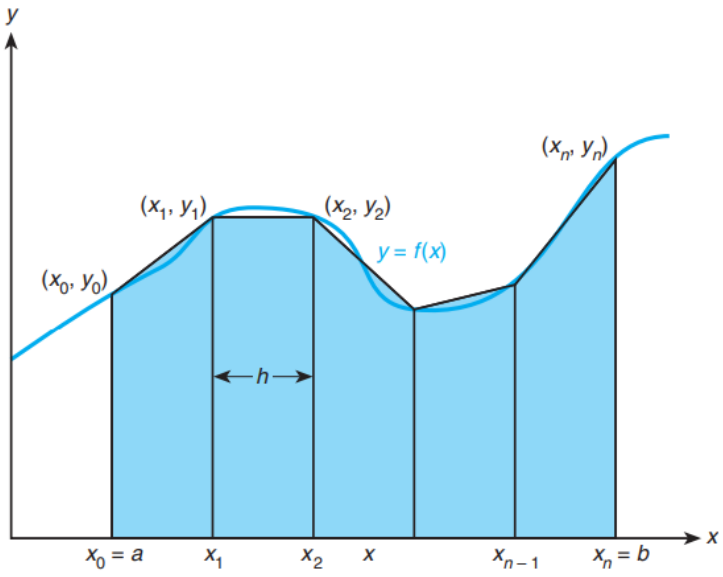

Figure 1

You should calculate the value of T for the function: $\mathbf{x^c + 2d}$, where c and d are integer user inputs. You should print **two** digits after decimal point for the value of T.

Example Input and Output:

```
Enter value of a:
1                                   //read user input
Enter value of b:
9                                   //read user input
Enter value of n:
4                                   //read user input
Enter value of c:
1                                   //read user input
Enter value of d:
2                                   //read user input
T: 54.00
```