ID1063 Lab Exam One
EP, ES

Time: 3 hours

Total Marks: 15
(Q1: 4 marks, Q2: 5 marks, Q3: 6 marks)

1. Write a program to accept marks (one value) and print a grade for it as follows: $> 85 : A$, $71 - 85 : B$, $56 - 70 : C$, $41 - 55 : D$, $< 40 : F$.

   Disclaimer: These ranges are not indicative of actual grade calculation for any course at IITH.

2. Write a program that accepts a character and displays all the letters in the English alphabet starting from the given letter. If the letter is uppercase, the function displays the alphabet in uppercase. If the character is not from the English alphabet, the function displays an error message.

   Example runs:

   Enter a character: c

   c d e f g h i j k l m n o p q r s t u v w x y z a b

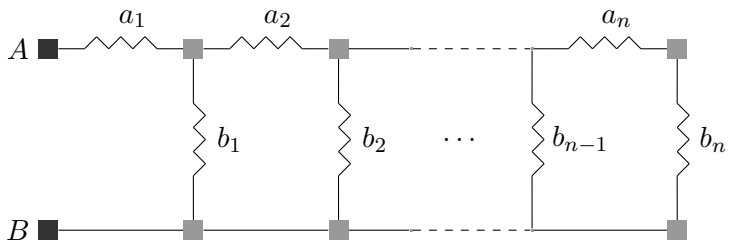
   Enter a character: H

   H I J K L M N O P Q R S T U V W X Y Z A B C D E F G

   Enter a character: $

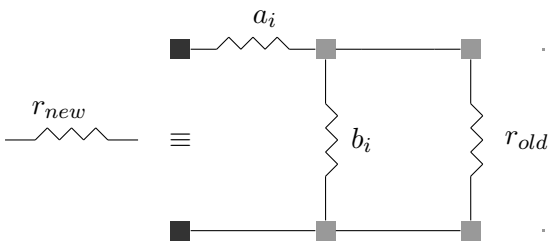
   $ is not an English letter.

3. A **step-ladder** arrangement of resistors is shown below.



Write a program which accepts the the values of the resistances (a_is and b_is as in the picture) in two arrays, and prints the effective resistance between A and B. Assume that all values are in some common unit, eg: ohms.

Hint: Update the value of the effective resistance from right-to-left as shown below.



When two resistances of valuew r_1, r_2 are combined in parallel, the effective resistance is $\frac{r_1 r_2}{r_1 + r_2}$, and when they are in series, the effective resistance is $r_1 + r_2$.

Example runs:

Enter the value of n: 2

Enter the value of the a_i: 2 2

Enter the value of the $b_i s$: 1 1

The effective resistance is: 2.75.

Enter the value of n: 3

Enter the value of the a_i: 1 2 3

Enter the value of the $b_i s$: 1 1 1

The effective resistance is: 1.7368.