

1 ICS 104 Homework 5

1.1 Note:

- This notebook will be graded **automatically**, you need to follow these guidelines to obtain your grade.
- **Don't edit or remove the line that starts with `%%code`**.
- **Use a C compiler to solve the questions then paste your code in this notebook**
- **make sure your program output matches the sample runs given. if the sample run for example prints 'Two', your code must print the same NOT '2'.**
- **You can copy the output message from the sample runs and add it to your code. No spelling mistakes will be ignored**

Make sure you fill in any place that says "YOUR CODE HERE" or "YOUR ANSWER HERE", as well as your **name and ID** below:

In []:

```
1 #don't modify the content of this cell just run it
2 from IPython.core.magic import (register_line_magic,
3                                 register_cell_magic)
4 _store = {}
5 ip = get_ipython()
6 @register_cell_magic
7 def code(line, cell):
8     _store[line.strip()]=cell
9     ip.run_cell(cell)
```

2 Question 1 (10 points)

Write a C program that computes the fee of renting a book from the library. To compute the book's rent fee the following information is provided for each book:

- Book publication year
- Rent duration: how long the book was rented in days.
- Maximum allowed duration: the maximum duration the library allows its members to rent the book in days.
 - if this duration is exceeded, a penalty will be taken from the renter

The library criteria to compute the rent fees are as follows:

- if the book's publishing year is after 2010 the fee is 6 Riyals per day. Otherwise it is 3 Riyals per day.
- if the rent duration exceeds the maximum allowed duration, the daily fee for each additional day is %20 more than the original daily fee.

Notes:

- You should prompt the user to enter the values similarly to the sample run below.
- Your output should be rounded to a single decimal place

2.1 Sample runs:

```
Enter the publication year of the book: 1997
Enter the renting duration: 23
Enter the maximum allowed rent duration for this book: 15
The rent fee = 73.8
```

```
Enter the publication year of the book: 2019
Enter the renting duration: 5
Enter the maximum allowed rent duration for this book: 20
The rent fee = 30.0
```

```
In [ ]: 1 %%code q1
2 // YOUR CODE HERE
3
4 #include <stdio.h>
5
6 int main()
7 {
8     int year , rentDays , max,fee;
9     double rentFee,additionalRent;
10    printf("Enter the publication year of the book: ");
11    scanf("%d",&year);
12    printf("Enter the renting duration: ");
13    scanf("%d",&rentDays);
14    printf("Enter the maximum allowed rent duration for this book: ");
15    scanf("%d",&max);
16    if (year > 2010)
17        fee = 6;
18    else
19        fee = 3;
20
21    if (rentDays <= max)
22        rentFee = rentDays * fee;
23
24    else
25        rentFee = (max * fee) + ((rentDays - max) * (fee + fee*0.2));
26
27    printf("The rent fee = %.1f",rentFee);
28
29    return 0;
30
31 }
```

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3 Question 2 (15 points)

Write a C program that accepts a collection of N numbers and it finds the largest value, the smallest value, the frequencies of both, and the average of the N numbers.

N value must be > 0 .

Hints:

- Read the values as entered from the user. (If $N = 5$, then there are 5 values the user is going to enter).
- frequency: is a count of repeated value.

3.1 Sample runs:

```
Enter the value of N : -1
Value of N is invalid! Try again!
Enter the value of N : 0
Value of N is invalid! Try again!
Enter the value of N : 4
Enter a number (1): 3.5
Enter a number (2): 3.5
Enter a number (3): 2
Enter a number (4): 1
Max val :3.50, frequency:2
Min val :1.00, frequency:1
average of N :2.50
```

```
Enter the value of N : 5
Enter a number (1): 4
Enter a number (2): 4
Enter a number (3): 4
Enter a number (4): 4
Enter a number (5): 4
Max val :4.00, frequency:5
Min val :4.00, frequency:5
average of N :4.00
```

```
Enter the value of N : 3
Enter a number (1): 4
Enter a number (2): -1.5
Enter a number (3): 2
Max val :4.00, frequency:1
Min val :-1.50, frequency:1
average of N :1.50
```

```
In [ ]: 1 %%code q2
2 //YOUR CODE HERE
3 #include <stdio.h>
4
5 int main()
6 { int N,count=0,fMax=1,fMin=1,x;
7   double value, max, min,total=0,avg,v1;
8
9   printf("Enter the value of N : ");
10  scanf("%d", &N);
11
12  while (N <= 0)
13  {
14    printf("Value of N is invalid! Try again!\n");
15    printf("Enter the value of N : ");
16    scanf("%d", &N);
17  }
18  printf("Enter a number (1): ");
19  scanf("%lf", &v1);
20
21  min = v1;
22  max = v1;
23  total = total + v1;
24  count = count + 1;
25  for (x= 2 ; x < N + 1 ; x++)
26  {
27    printf("Enter a number (%d): ", x);
28    scanf("%lf", &value);
29
30    if (value > max)
31    {
32      max = value;
33      fMax = 1;
34    }
35
36    else if (value == max)
37      fMax ++ 1;
38
39    if (min > value)
40    {
41      min = value;
42      fMin = 1;
43    }
44
45    else if (value == min)
46      fMin ++ 1;
47
48    total = total + value;
49    count ++ 1;
50  }
51  avg = total /count ;
52  printf("Max val :%.2f, frequency:%d \n",max,fMax);
53  printf("Min val :%.2f, frequency:%d \n",min,fMin);
54  printf("average of N :%.2f",avg);
55  return 0;
56 }
57
58 }
```

```
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