# Green University of Bangladesh
# Department of Computer Science and Engineering (CSE)
**Faculty of Sciences and Engineering**
**Semester: (Fall, Year:2023), B.Sc. in CSE (Day)**

**LAB REPORT NO 1**
**Course Title: Machine Learning Lab**
**Course Code : CSE 412 Section : 202D2**

**Lab Experiment Name:**

1. Write a Python program that calculates the frequency of each character in a given input string. Your program should count how many times each character appears in the input and display the results.

2. You are given the task of calculating the total tax amount for a person's income based on the following tax brackets: - Income up to $10,000 is taxed at a rate of 5%. - Income from $10,001 to $50,000 is taxed at a rate of 10% - Income from$50,001 to $100,000 is taxed at a rate of 20%. - Income over $100,000 is taxed at a rate of 30%.Your python program should take the user's income as input and calculate the total tax amount they owe based on the provided tax brackets.

## Student Details


| | Name | ID |
|---|---|---|
| **1.** | Nafis Fuad Tanvir | 201002437 |

**Lab Date** : 1/10/2023
**Submission Date** : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
**Course Teacher's Name** : Dr Muhammad Abul Hasan

**[For Teachers use only: Don't Write Anything inside this box]**

| **Lab Report Status** | |
|---|---|
| **Marks: ……** | **Signature:.....** |
| **Comments:.....** | **Date:.....** |

**1. TITLE OF THE LAB EXPERIMENT**

Calculating the frequency of characters in a given string and calculating tax from the given condition.

**2. OBJECTIVES/AIM [1]**

The objectives of this problems are:

i. Learn basic python.
ii. Learn how to solve problems with python.
iii. Learn string processing in python.
iv. Learn loop concept in python.

**3. PROCEDURE / ANALYSIS / DESIGN [2]**

**Procedure to solve problem 1: -**

i. Get the input string from the user.
ii. Initialize the empty string variable to store the result.
iii. Iterate through each character in the input string.
iv. Initialize a count variable to keep track of the frequency.
v. Check if the character is already in the result string.
vi. Iterate through the input string again to count the frequency.
vii. Add the character and its frequency to the result string.

**Procedure to solve problem 2: -**

i. Get the user_income from the user.
ii. total_tax is initialized to 0. This variable will calculate the total tax amount.
iii. uses if-elif-else statements to calculate the tax based on the condition
iv. If the income is less than or equal to $10,000, the tax is calculated as user_income * 0.5. this tax amount is added to total_tax.
v. if the income is greater than $10,000 and less than or equal to $50,000, the program calculates the tax in two parts:
Tax on the first $10,000: 10000 * 0.5
Tax on the income above $10,000: (user_income - 10000) * 0.10
these two tax amounts are added together and added to total_tax.
vi. By following the method in v, all condition are satified and checked as given in the question

**4. IMPLEMENTATION [2]**

**Implementation of problem 1: -**

```
string= input("enter the string:-")
result=""

for i in string:
  count=0

  if i not in result:
    for j in string:
      if i==j:
        count+=1

    result+= f"'{i}': {count} "

print(result)
```

**Implementation of problem 2: -**

```
users_income= int(input("enter users income:- "))
total_tax=0

if users_income<=10000:
   total_tax = users_income * 0.05
elif users_income <= 50000:
    total_tax = 10000 * 0.05+ (users_income - 10000) * 0.10

elif users_income <=  100000:
    total_tax = 10000 * 0.05+ (50000 - 10000) * 0.10 + (users_income - 50000) * 0.20
else:
   total_tax = 10000 * 0.05 + (50000 - 10000) * 0.10 + (100000 - 50000) * 0.20 + (users_income - 100000) * 0.30

print(f"Total tax amount owed: ${total_tax:.2f}")
```

**5. TEST RESULT / OUTPUT [2]**

**Output of problem 1:**

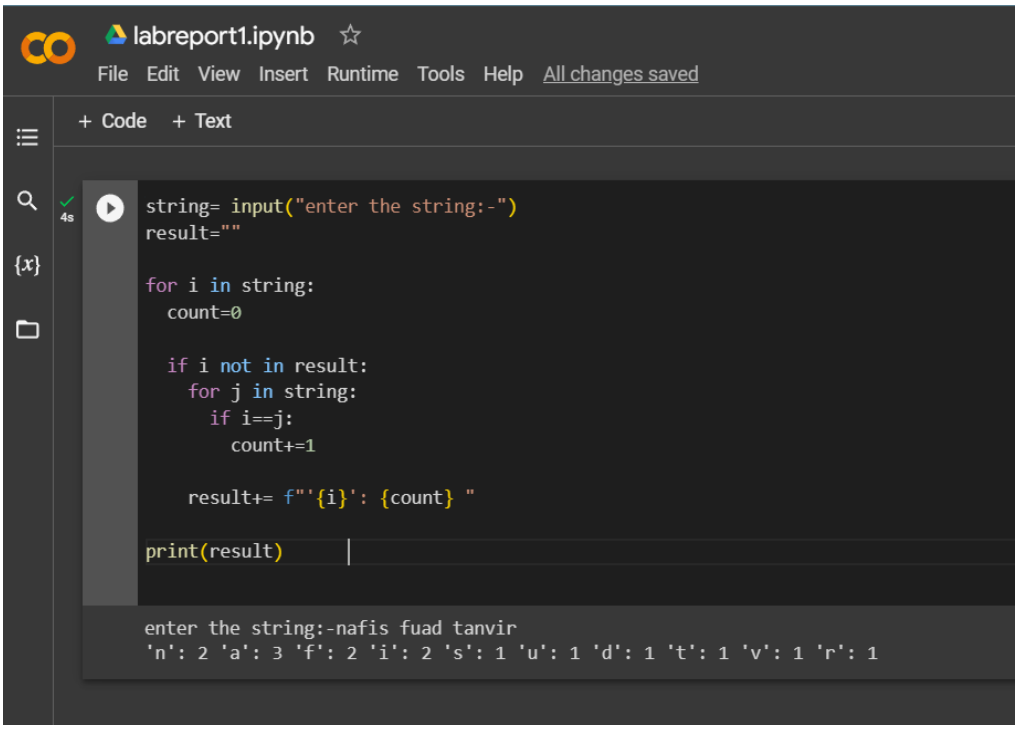


Fig: output of problem1

**Output of problem 2:**

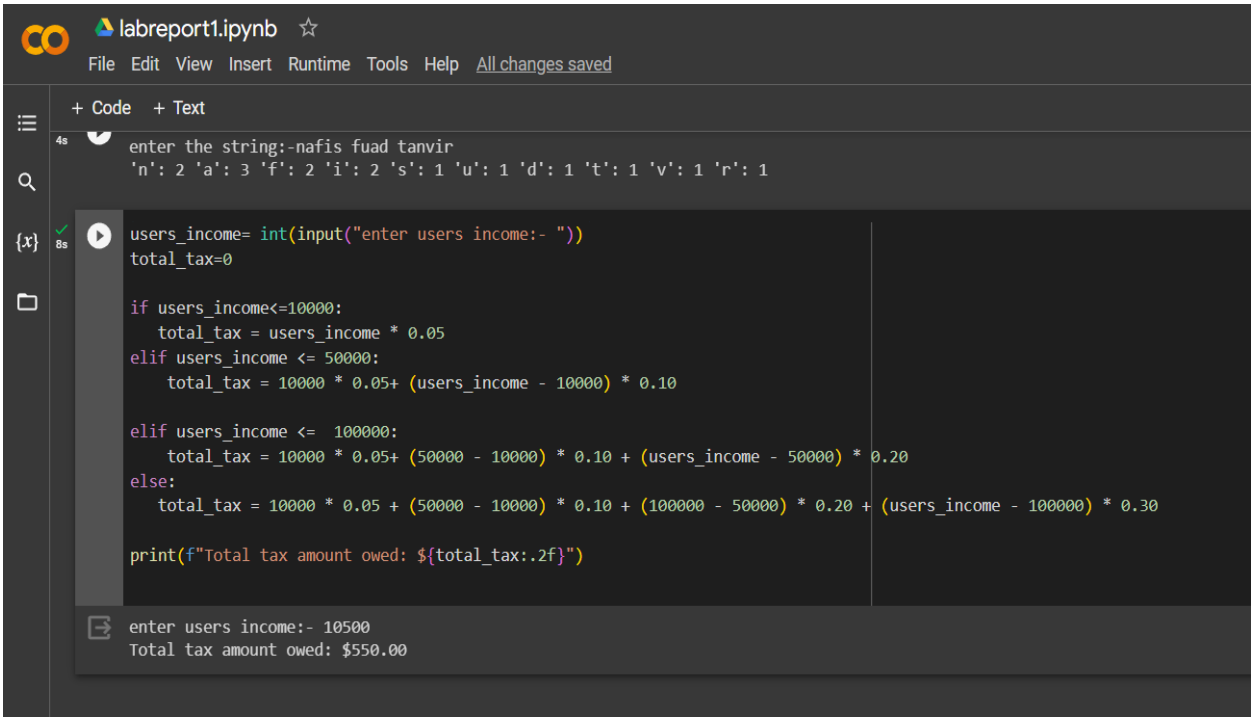


Fig: output of problem2

## 6. ANALYSIS AND DISCUSSION [2]

In this section the following questions should be answered:

1. Analysis and discussion of the result / output.
   Ans: The results are great, I fulfilled all the condition and solve the problem
2. What went well?
   Ans: The programs run successfully.
3. What were the trouble spots in completing this assignment?
   Ans: Making the logic to solve the problems.
4. What parts caused you the most trouble? or What were the most difficult parts of your program to implement?
   Ans: Making the logics according to the given question and solve it in python programming,
5. What did you like about the assignment?
   Ans: I like that I can now solve problems using python programming.
6. What did you learn from it?
   Ans: I learn to solve problems using python language.
7. Mapping of objective, that is explanation of the achievement of objective/aim of the given problem.
   Ans: - The aim of this two problems are finding the character quantity in a string and another one is calculate tax by following the given condition. I think I achieved the objective of this lab experiment as I solve both of the questions.