Department of computer Science and Engineering

National Institute of Technology Calicut

Monsoon Semester-2022-23

Evaluation:4 CS 4097D Object-Oriented Systems Lab Date:12/10/2022

1. Write a program called **CountVowelsDigits**, which prompts the user for a String, counts the number of vowels (a, e, i, o, u, A, E, I, O, U) and digits (0-9) contained in the string, and prints the counts and the percentages (rounded to 2 decimal places).

   Sample INPUT and OUTPUT
   Enter a String: testing12345
   Number of vowels: 2 (16.67%)
   Number of digits: 5 (41.67%)

2. Consider a banking system Initially, we will add customer details to the bank, and we will be able to do some processing on the customer account. It should be a menu driven program to add the customer details, display the customer details, deposit/withdraw from the account.

   To implement the functionality, the details of the customer (accountNumber, name and balance) should be added through the constructor. Class should have member functions display(), deposit() and withdraw() for processing.

   For the input and output format, refer the sample input and output.

   Sample INPUT and OUTPUT
   Enter Account No: 101
   Enter Name: Chintu
   Enter Current Balance: 25000

   Main Menu
   ****
   1.Display
   2.Deposit
   3.Withdrawal
   4.Exit

   Enter Ur Choice:1

101, Chintu,25000

Main Menu
****
1.Display
2.Deposit
3.Withdrawal
4.Exit

Enter Ur Choice:2
Enter Amount to Deposit:500

Main Menu
****
1.Display
2.Deposit
3.Withdrawal
4.Exit

Enter Ur Choice:1
101, Chintu,25500

Main Menu
****
1.Display
2.Deposit
3.Withdrawal
4.Exit

Enter Ur Choice:3
Enter the amount to withdraw:5000

Main Menu
****
1.Display
2.Deposit
3.Withdrawal
4.Exit

Enter Ur Choice:1
101, Chintu,20500
Main Menu

****
1.Display
2.Deposit
3.Withdrawal
4.Exit

Enter Ur Choice:4

3. Joy wants to calculate and print the Electricity bill of a given customer. The customerId., typeOfConnection, customerName and unitConsumed by the user should be taken from the keyboard and display the total amount to be paid by the customer. The charge is as follow:

Domestic connection		**Commercial connection**	
Units	**Charge (VAT exclusive)**	**Units**	**Charge (VAT exclusive)**
First 100 units	Rs. 1 per unit	First 100 units	Rs. 2 per unit
101-200 units	Rs. 2.50 per unit	101-200 units	Rs. 4.50 per unit
201-500 units	Rs. 4 per unit	201-500 units	Rs. 6 per unit
>501 units	Rs. 6 per unit	>501 units	Rs. 7 per unit

There should be a Customer class in the application having two member functions, readCustomer() and calculateAmount(). If the calculated amount exceeds Rs. 400 then a surcharge of 15% on the calculated amount will be charged.

Sample Input and Output

Connection Type: Domestic
Input Customer ID :10001
Input the name of the customer: John
Input the unit consumed by the customer: 800
Electricity Bill

Customer ID :10001
Customer Name :John
unit Consumed :800
Amount Charges @Rs. 6.00 per unit: 4800.00

Surcharge Amount : 720.00
Net Amount Paid By the Customer : 5520.00

4. Write a program to identify the winner in an election given the total number of votes received by each of the candidates. Define a class **Candidate** having the following fields ***candidateName (single word)*** and ***candidateVote***. A ***candidateVote*** has the following format: <X-yyyy> where X is the party name (single word) and yyyy(a four digit number) is the number of votes received by the candidate. If more than one candidate has the highest number of votes, then display each candidate in each line in the alphabetical order of their party name. Assume that the party name contains only Uppercase alphabets.

   Input format:
   Input may consist of multiple lines.
   - First line contains the number of candidates in the election (N).
   - Next N pairs of lines contain the values of ***candidateName*** in the first line and ***candidateVote*** in the second line.

   Output format:
   - If there is only one winner, then display the ***candidateName*** with the highest number of votes.
   - If there is more than one winner, (multiple candidates have highest number of votes), then display the ***candidateName*** in each line based on the alphabetical order of their party name

   Sample input:
   3
   Daniel
   BJP-8544
   Jeevan
   CPM-8999
   Vijayan
   UDF-9971
   Sample output:
   Vijayan

5. Write a program to calculate tax paid by employees in a company. The employees having annual income less than 2.5 lakh per annum need not pay the tax (i.e, tax is 0). Others will be charged to pay tax (annual income*TaxPercentage). Identify the class, it's attributes and member functions; design accordingly.

Range of annual income (shown in lakhs)	TaxPercentage
2.5<= income< 10	10 %
income >= 10	20 %

Input format:

The first line specifies the number of employees, N (an integer greater than zero)
The next N lines specify the employee details (name and annual income) separated by a colon.

Output format:

- If the number of employees N given in input is not greater than zero, then display "INVALID"
- Otherwise display the name of the employee and the tax amount (rounded to 2 decimal places) separated by colon in each line.

Sample input:

3
Jennifer Sebastian:750000
Rahul Ram P:500000
Sanju Alex:25000

Sample output:

Jennifer Sebastian:75000.00
Rahul Ram P:50000.00
Sanju Alex:0.00