Lab 2 (Strings, Selection)

1. (String) Write a program that reads in an email address, e.g. joe@suss.edu.sg
    Display the name and the organisation on separate lines. Example:
    ```
    Input email address: joe@suss.edu.sg
    Name is joe
    Organisation is suss.edu.sg
    ```
    Assume input is valid.

2. (String) Write a program that reads in a string input consisting of 2 words with a blank in between. The program displays each of the word in reverse. Example:
    ```
    Enter string: java python
    Output: avaj nohtyp
    ```
    Assume input is valid.

3. (if…else) Write a program that reads in 2 integer values. Display one of the following messages:
    - "The 2 numbers are the same"
    - "The 2 numbers are not the same"

4. (String, if…else) Write a program that reads a string and checks whether it is a palindrome. It displays either the message palindrome or the message not a palindrome. A palindrome is a word that spells the same backwards, e.g., the word solos is a palindrome.

5. (if…else) A telco charges the following for usage of data in a foreign country:

Data	Rate
Up to 2GB	$5 flat
Above 2GB	$5 + $1 for every 100MB or part thereof

    Two example runs are shown here:

    Run 1:
    ```
    Amount of data used (GB): 1.5
    Charge is $5.00
    ```

    Run 2:
    ```
    Amount of data used (GB): 2.54
    Charge is $11.00
    ```

    (Make use of the ceil() function from Math library)

6. (if…elif…else) Write a program that determines whether two integers are even or odd. Display one of the following messages:
    - "The 2 numbers are even"
    - "The 2 numbers are odd"
    - "One number is even and the other is odd"

7. (String, if…elif…else) Singapore NRIC numbers have the following format **#0000000@**, where
   - length of the NRIC is 9
   - # is a letter that can be "S", "T", "F" or "G"
   - followed by 7 digits
   - @ is any reference letter A to Z or a to z

   Write a program that inputs a NRIC number and displays whether a NRIC is valid. Display "Valid NRIC" or, if it is invalid, one of the following error messages:
   - Length must be exactly 9
   - The first letter must be S, T, F or G
   - Must consist of 7 digits
   - Reference letter must be A to Z or a to z

   Example,
   Run 1
   ```
   Enter NRIC: S1234567A
   Valid NRIC
   ```

   Run 2
   ```
   Enter NRIC: X123456789B
   Length must be exactly 9
   ```

   Run 3
   ```
   Enter NRIC: S12345XXB
   Must consist of 7 digits
   ```

   (Make use of isdigit() and isalpha() function)

8. (if…elif…else) Modify the program in question 2 with the following rate:

Data	Rate
Up to 2GB	$5 flat
Above 2GB	$5 + $1 for every 100MB or part thereof
Above 4GB	$25 flat

   The program also validates that input must be greater than 0. Otherwise, display "Invalid input!".

9. Write a simple calculator program that performs arithmetic operation on 2 numbers. Input consists of 3 values, separated by an arithmetic operator, in the following format:
   float operator float
   where float is any decimal number and operator is either **+, -, *, /**.

   Run 1
   ```
   Enter arithmetic expression: 23.6 + 33.2
   Result: 56.8
   ```

Run 2
```
Enter arithmetic expression: 85 % 15
Invalid arithmetic operator
```

Assume that the numeric values are valid, but the the operator may be invalid.

10. Write a triangle checker program that reads in the 3 sides of a triangle. The program checks whether the 3 values can form a triangle. A triangle will not be possible if the sum of any two is less than or equal to the third. If the values can form a triangle, print the type of triangle according to the table below.

All 3 sides are equal	equilateral
Any two sides are equal	isosceles
All 3 are unequal	scalene

11. A computer store allows customers to buy laptops and pay by instalments. The payment plan is based on the purchase amount as given in the following table:

Amount	Payment
Less than 1000	No instalment. Pay full amount.
At least 1000	Either pay in 6 monthly instalments with an addition of 5% of the amount, or pay in 12 monthly instalments with an addition of 10% of the amount Payment is the result of adding interest to the amount and then dividing by the number of monthly installments.

Write a program that reads in the amount of the laptop. If the amount is at least 1000, prompt the user to select 0, 6 or 12 months, and displays the instalment plan. Examples of different input are as follows:

Run 1
```
Enter amount: 800
Please pay $800.00. No instalment plan.
```

Run 2
```
Enter amount: 1200
Pay in 0, 6 or 12 month instalment: 0
Please pay $1200.00. No instalment plan.
```

Run 3
```
Enter amount: 2400
Pay in 0, 6 or 12 month instalment: 6
6 month instalment plan of $420.00 per month
```

(Interest on 2400 at 5% for 6 months is 120. Total amount = 2400+120=2520. Divide by 6 = 420)