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. Assume 1GB = 10 X 100MB.

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 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 display 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)