Luxor University
Faculty of computers and information

Programming Fundamentals

Lab Sheet #2

Objectives:

- Learn how to think on paper before coding.
- Learn how to construct your program step by step in detail (Algorithm).
- Learn how to present your program algorithm in an efficient and organized way.
- Start you first C console programs.
- Learn how to solve problems using (variables & data types, input & output and operators).

Problems:

- Print
- Data-type size
- Arithmetic expression1
- Shift number
- Sum of 3 numbers
- Area of circle
- Swap
- Arithmetic expression2
- Quotient & Remainder
- Animal age
- Elephant
- Candies = happiness
- Even or odd

Print

Problem statement:

Make a program to print an Integer (Entered by the User)

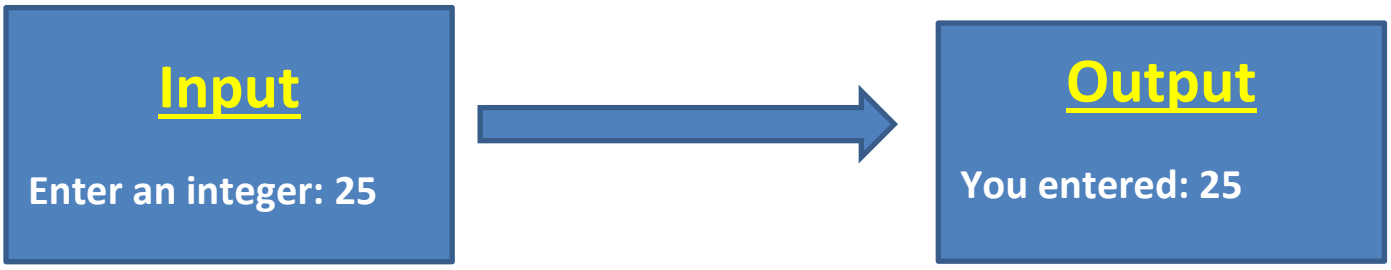
Input:

1 integer.

Output:

1 integer.

Example 1:



Data-type size

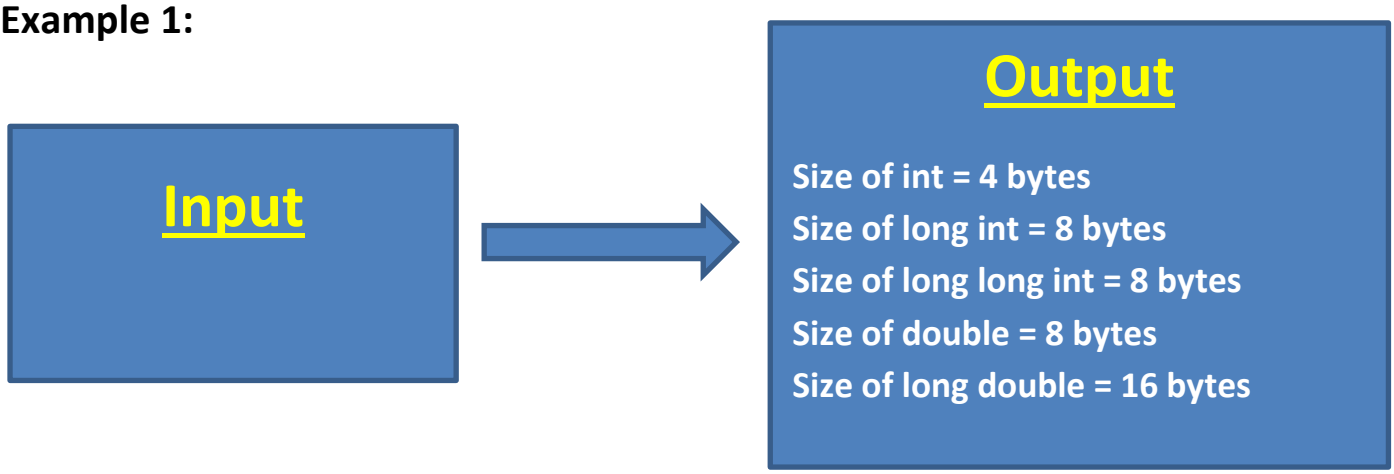
Problem statement:

Make a program to demonstrate the working of keyword long

Output:

Data types sizes.

Example 1:



Arithmetic expression1

Problem statement:

Write a C program to read the values of x and y and print the results of the following expressions in one line:

i. (x + y) / (x - y)

ii. (x + y)(x - y)

Input:

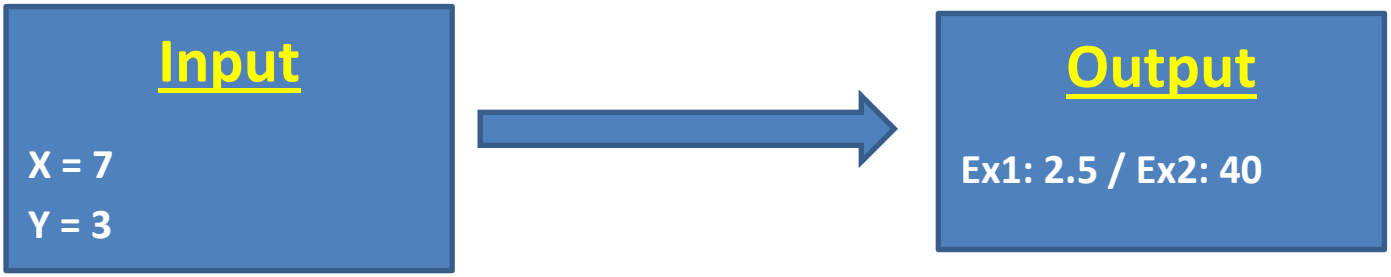
2 numbers(x, y) while (x ≠ y).

Output:

The results of these expressions in one line.

Example 1:

Example 2:



Shift number

Problem statement:

Write a C program to read a number (x) and shift it right 2 times and output the decimal number after shifting.

Input:

Number (x).

Output:

the decimal number after shifting right 2 times.

Example 1:

Explanation:

7 = 111 -> 001 = 1

Sum of 3 numbers

Problem statement:

Instead of using our simple calculator, make a program that take 3 numbers from user and output their sum.

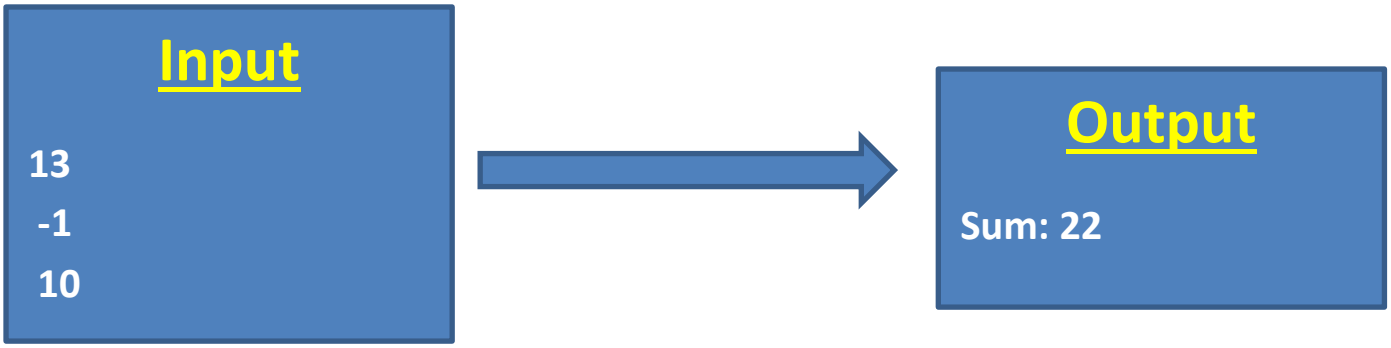
Input:

3 numbers: x, y, z.

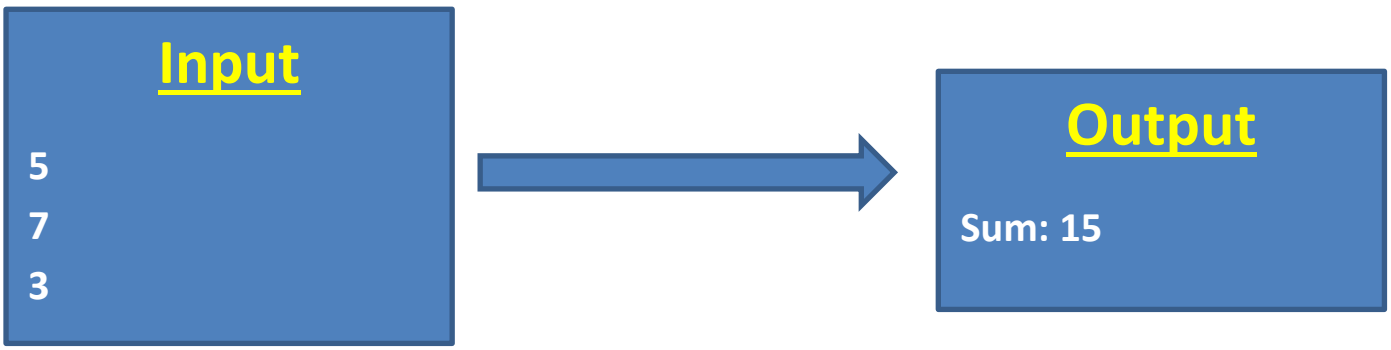
Output:

Sum of (x, y and z).

Example 1:



Example 2:



Area of circle

Problem statement:

Make a program that take the radius of the circle from user (r) and output the area of circle.

Notes:

Area of circle = πr^2

Input:

Circle radius (r).

Output:

Circle area.

Example 1:

Swap

Problem statement:

In you program make 2 variables (x, y), initialize x with 3 and y with 5 then swap their values.

Challenge:

Don’t use third variable in swapping.

Arithmetic expression2

Problem statement:

Write a C program to evaluate the arithmetic expression:

((a + b / c * d - e) * (f - g))

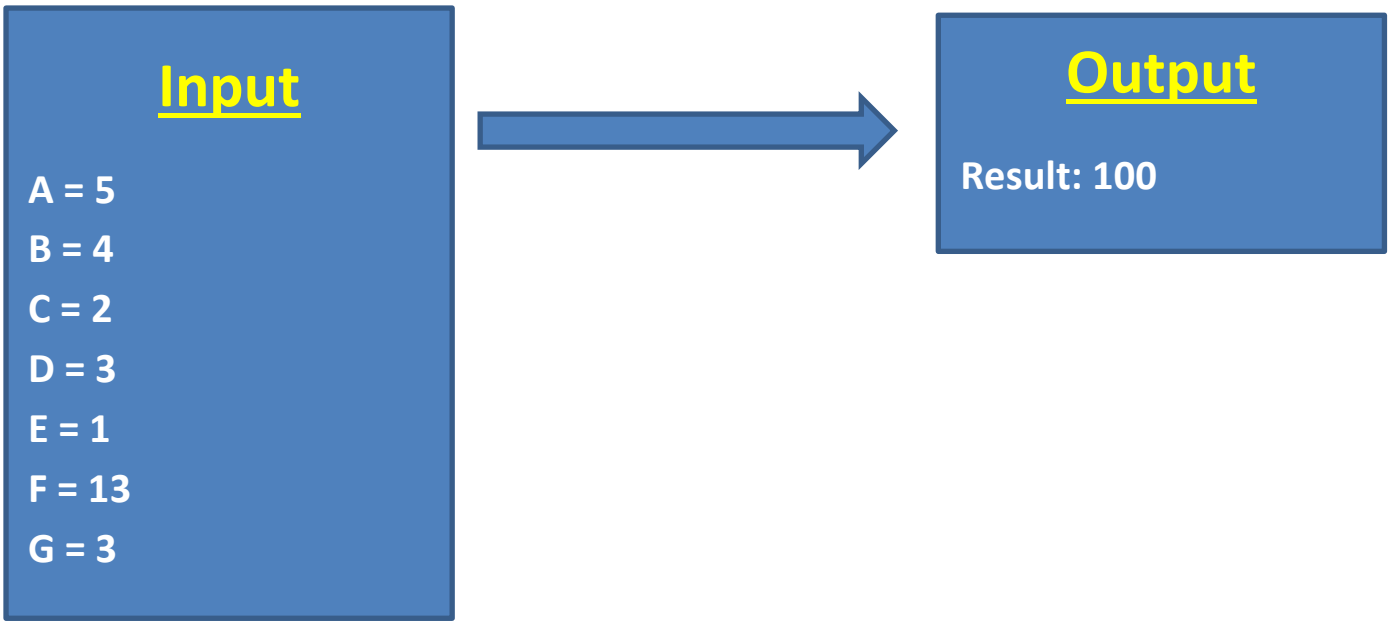
Input:

Values (a, b, c, d, e, f, g).

Output:

The results of expression.

Example 1:



Quotient & Remainder

Problem statement:

Write a C program to compute quotient and remainder of two numbers.

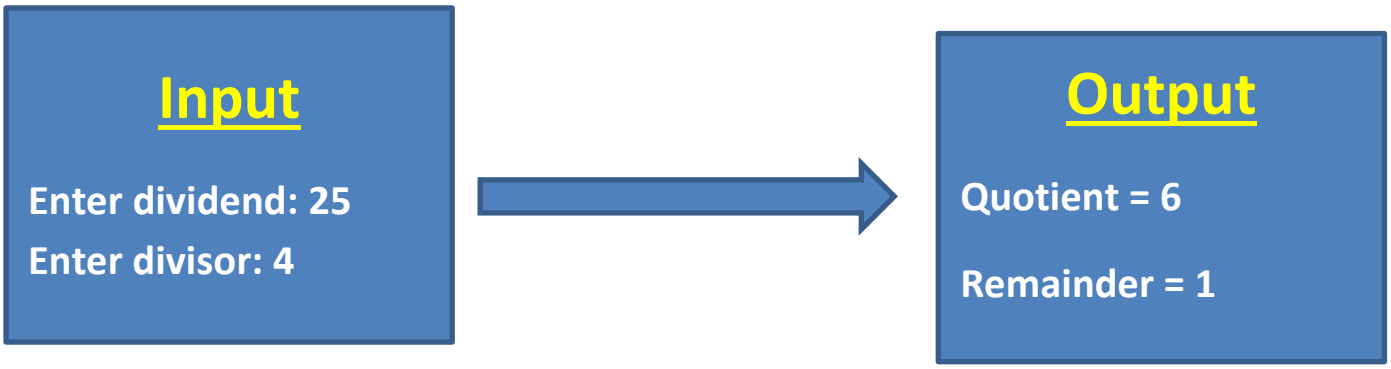
Input:

2 numbers.

Output:

Quotient and remainder of input two numbers.

Example 1:



Animal age

Problem statement:

We have animal lived for (n) days. Can you tell us how many years, months and days this animal lived?

Notes:

Consider the whole year has **365** days and **30** days per month.

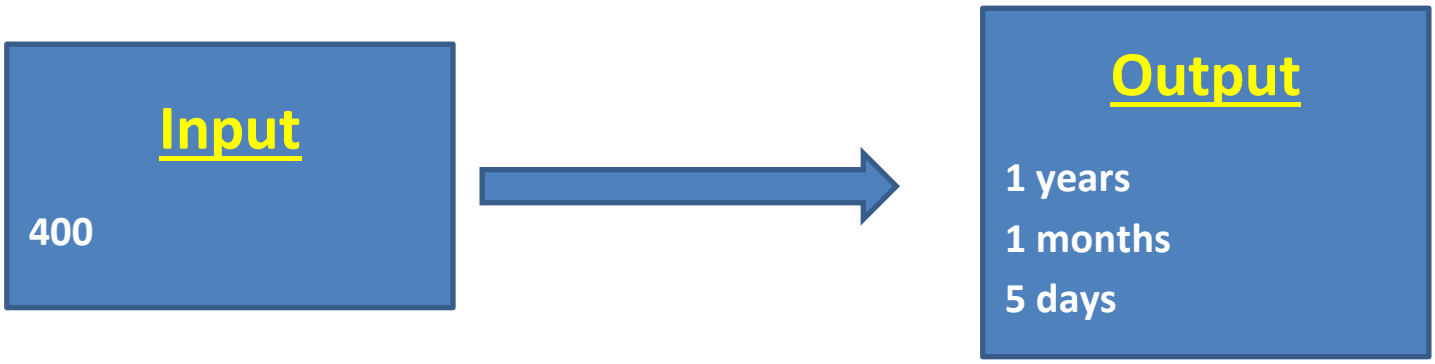
Input:

Number of days this animal lived (n).

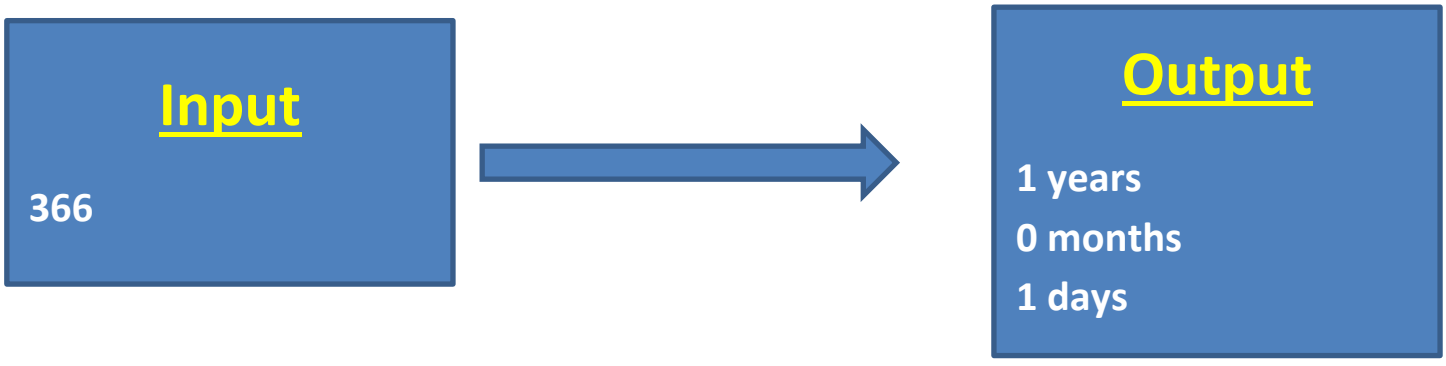
Output:

Based on (n) days how many years, months and days lived this animal.

Example 1:



Example 2:



Elephant

Problem statement:

An elephant decided to visit his friend. It turned out that the elephant's house is located at point 0 and his friend's house is located at point x(x > 0) of the coordinate line. In one step the elephant can move 1, 2, 3, 4 or 5 positions forward.
Determine, what is the minimum number of steps he needs to make in order to get to his friend's house.

Input:

x value.

Output:

The minimum number of steps he needs to make in order to get to his friend's house.

Example 1:

Example 2:

Candies = happiness

Problem statement:

To make people happy, sell candies!

The store bought a package of (n) candies, for (x) dollars each, and the store wants to know the total profit the store is going to get after selling all (n) candies for (y) dollars each.

Can you help the store to know?

Input:

3 values (n, x, y).

Output:

Output one line containing the required answer.

Example 1:

Even or odd

Problem statement:

Write a program that reads an input (x). If (x) is even output 0 otherwise output 1 **without using conditions**.

Input:

x value.

Output:

If (x) is even output 0 otherwise output 1.

Example 1:

Example 2: