

Control Flow Statements Exercises

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■ Input from keyboard in C/C++:

- **scanf**, **std::cin >>** do not clean input stream.
- Clean and safe input from keyboard:
 - Input a whole line (includes '\n').
 - Extract data from the line: **sscanf**, **std::stringstream**.
 - Validate data by result value.

```
int a;  
char line [100];  
do {  
    printf("Enter a integer = ");  
    fgets( line, 100, stdin );  
} while ( sscanf( line, "%d", &a ) != 1 );  
// C++  
// } while ( !( std::stringstream( line ) >> a ) );
```



■ Practice 3.6:

Write C/C++ program to classify a triangle:

- Enter 3 positive real numbers a, b, c (re-enter if invalid).
- Check if a, b, c can form a triangle.
- If yes, print the triangle type.
(normal, right, isosceles, right-isosceles, equilateral).

Input format:

Enter 3 positive real numbers = 3 4 5

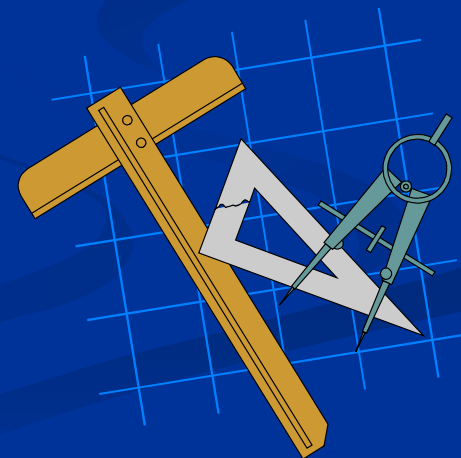
Output format (can form a triangle):

Can form a triangle.

Right triangle.

Output format (cannot form a triangle):

Cannot form a triangle!





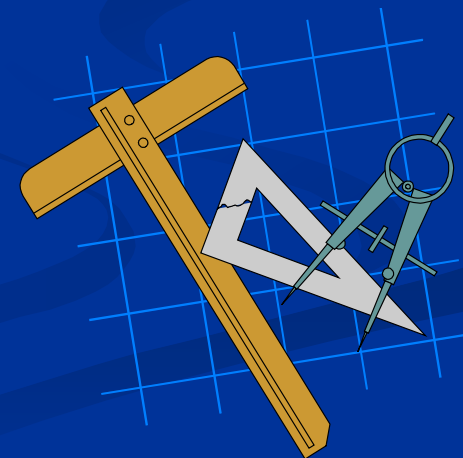
■ Practice 3.7:

Write C/C++ program to compute electricity bill:

- Enter old and new kWh (re-enter if invalid).
- Compute the price and print result.

Price table:

Levels	Consumed kWh	Unit prices
1	0 – 100	1549 đ
2	101 – 150	1600 đ
3	151 – 200	1858 đ
4	201 – 300	2340 đ
5	301 – 400	2615 đ
6	401 – more	2701 đ





■ Practice 3.8:

Write C/C++ program find max and min as follow:

- Enter a sequence of positive integers.
(re-enter if invalid, stop if enter zero).
- Print max and min (do not include zero).

Notes: do not use array.

Input format:

Number 1 = 5

Number 2 = 3

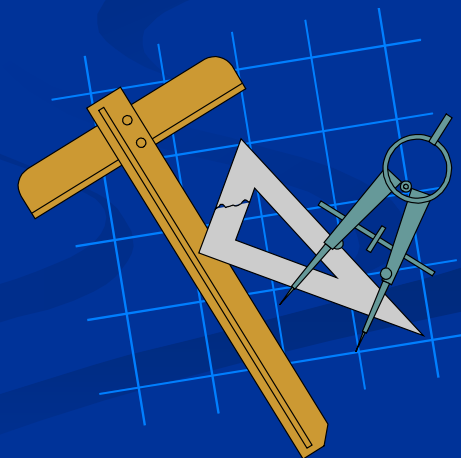
Number 3 = 9

Number 4 = 0

Output format:

Max = 9

Min = 3





■ Practice 3.9:

Write C/C++ program to find prime numbers:

- Enter a positive integer N (re-enter if invalid).
- Print all prime numbers $\leq N$.

Input format:

Enter a positive integer = 11

Output format:

#1 = 2

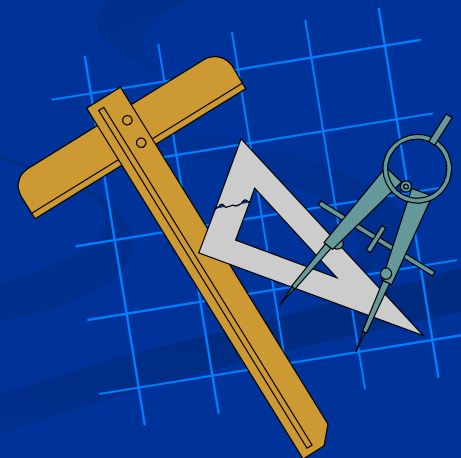
#2 = 3

#3 = 5

#4 = 7

#5 = 11

There are 5 prime numbers.





■ Practice 3.10:

Write C/C++ program to find GCD (greatest common divisor) and LCM (least common multiple):

- Enter 2 positive integers a, b (re-enter if invalid).
- Print:
 - GCD of a, b.
 - LCM of a, b.

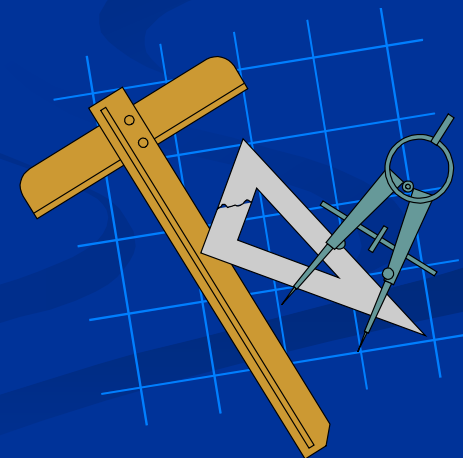
Input format:

Enter 2 positive integers = 8 12

Output format:

GCD = 4

LCM = 24





■ Practice 3.11:

Write C/C++ program to print bit representation of an integer:

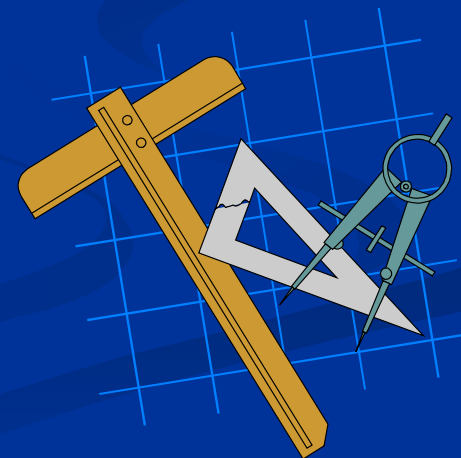
- Enter integer N and positive integer M.
- Print the first M bit from the right of N.

Input format:

Enter N, M = 11 3

Output format:

The first 3 bit from the right of 11: 011





■ Practice 3.12:

Write C/C++ program to read phone number as follow:

- Enter a phone number (10 digits max) (re-enter if invalid).
- Print how to read the phone number.

Notes:

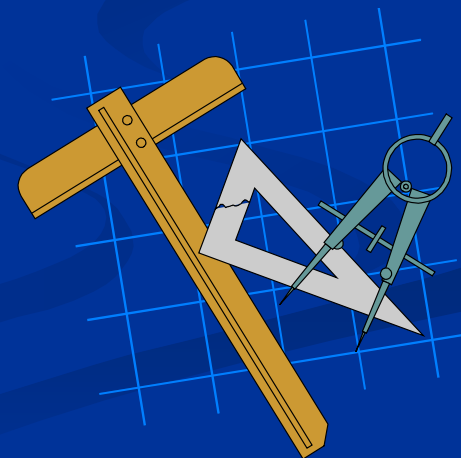
- Do not use array/string processing (get element, get length).

Input format:

Phone number: 838272727.

Output format:

Eight three eight two seven two seven two seven.





■ Practice 3.13:

Write C/C++ program as follow:

- Enter a positive integer N (re-enter if invalid).
- Check if:
 - a) Digits of N is in descending order from the ones.
 - b) Digits of N is symmetric.

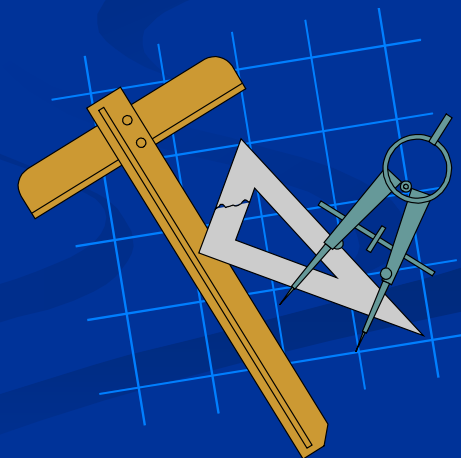
Input format:

Enter N = 12344321

Output format:

Not descending.

Symmetric.





■ Practice 3.14:

Write C/C++ program to print month calendar as follow:

- Enter month and year (re-enter if invalid).
- Enter day of week of the first day in the month (for alignment).
- Print the calendar of the month.

Input format:

What month and year to view calendar? 9 2022

What is the day of week of the first day? 5

Output format:

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		





■ Practice 3.15:

Write C/C++ game for grade 1 student to practice +, - as follow:

- Computer asks randomly + or – between two positive integers.
- Player answers the result (re-enter if wrong).
- Computer continues to asks until player answers zero.
- Constraint: operands, result in range [1..99].

Notes: use srand, rand (<stdlib.h>) to generate random numbers.

Game format:

Question 1: $2 + 5 = ?$

Answer: 7

Question 2: $18 - 9 = ?$

Answer: 8

Answer: 9

Question 3: $6 + 25 = ?$

Answer: 0

