Lab Hand-out 4

Conditional Statement & For Loop

Task1

Write a program in C++ to display the multiplication table vertically from 1 to n. n may be taken as an input from the user.

Sample Output:

n = 5

1x1=1	2x1=2	3x1=3	4x1=4	5x1=5
1x2=2	2x2=4	3x2=6	4x2=8	5x2=10
1x3=3	2x3=6	3x3=9	4x3=12	5x3=15
1x4=4	2x4=8	3x4=12	4x4=16	5x4=20
1x5=5	2x5=10	3x5=15	4x5=20	5x5=25
1x6=6	2x6=12	3x6=18	4x6=24	5x6=30
1x7=7	2x7=14	3x7=21	4x7=28	5x7=35
1x8=8	2x8=16	3x8=24	4x8=32	5x8=40
1x9=9	2x9=18	3x9=27	4x9=36	5x9=45
1x10=10	2x10=20	3x10=30	4x10=40	5x10=50

Task2

Write a program in C++ to make such a pattern like a pyramid with an asterisk. Number of rows may be taken as an input from the user.

Sample Output:

Input number of rows: 5

```
    *
   * *
  * * *
 * * * *
* * * * *
```
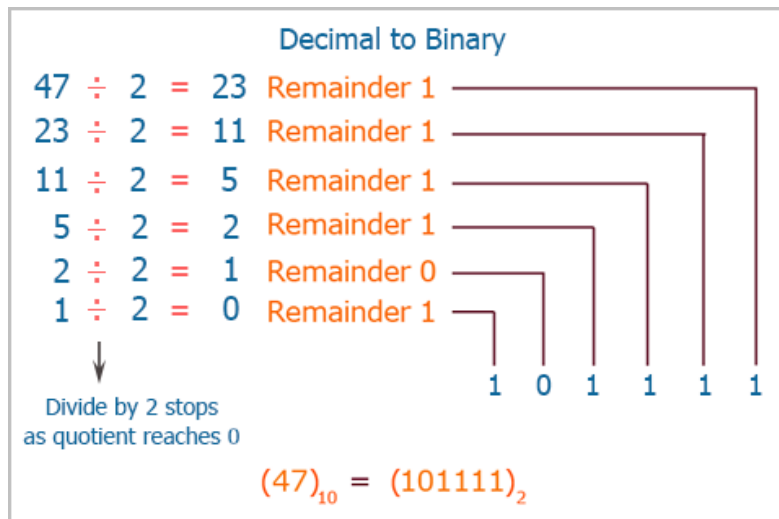
Task3

Write a program in C++ to convert a decimal number to binary number.

Sample Output:

Input a decimal number: 35

The binary number is: 100011

Decimal to Binary

$47 \div 2 = 23$ Remainder 1
$23 \div 2 = 11$ Remainder 1
$11 \div 2 = 5$ Remainder 1
$5 \div 2 = 2$ Remainder 1
$2 \div 2 = 1$ Remainder 0
$1 \div 2 = 0$ Remainder 1

Divide by 2 stops
as quotient reaches 0

1 0 1 1 1 1

$(47)_{10} = (101111)_2$

Task4

Write a program in C++ to convert a binary number to decimal number.

Sample Output:

Input a binary number: 1011

The decimal number: 11

Binary to Decimal

1 1 0 1 1 0 1 1

$1 \times 2^0 = 1 \times 1 = 1$
$1 \times 2^1 = 1 \times 2 = 2$
$0 \times 2^2 = 0 \times 4 = 0$
$1 \times 2^3 = 1 \times 8 = 8$
$1 \times 2^4 = 1 \times 16 = 16$
$0 \times 2^5 = 0 \times 32 = 0$
$1 \times 2^6 = 1 \times 64 = 64$
$1 \times 2^7 = 1 \times 128 = 128$

$1 + 2 + 8 + 16 + 64 + 128 = 219$

$(11011011)_2 = (219)_{10}$