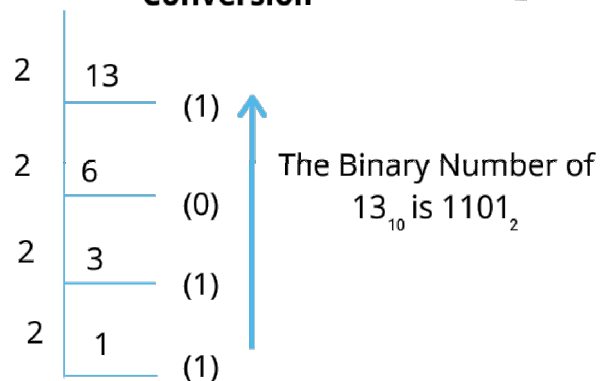


Book 1 Java: Programming Basics

Decimal	Binary	Hex
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Decimal To Binary Number Conversion



Binary to Decimal Conversion:

Example1:

$$11011010 = (1 * 128) + (1 * 64) + (0 * 32) + (1 * 16) + (1 * 8) + (0 * 4) + (1 * 2) + (0 * 1) = 128 + 64 + 16 + 8 + 2 = 218$$

Example2:

$$10011101 = (1 * 128) + (0 * 64) + (0 * 32) + (1 * 16) + (1 * 8) + (1 * 4) + (0 * 2) + (1 * 1) = 128 + 16 + 8 + 4 + 1 = 157$$

Q1. What is Output of following code? if int a=5, b=10;

- | | |
|------------------------|-----------------------------|
| i. a+b-a*b+a = | vi. a++ + -- b = |
| ii. a++ + b = | vii. a + b ++ + a = |
| iii. a++ + ++b = | viii. a++ + b -- -b = |
| iv. a++ + b -- = | ix. -- b + a++ + b = |
| v. --a + b = | x. b++ - a++ + b = |

Q2. What is Output of following code? if int a=2, b=3;

- | | |
|-------------------|--------------------|
| i. a<<b = | vi. 0<<a = |
| ii. b<<a = | vii. a>>5 = |
| iii. a>>b = | viii. a<<5 = |
| iv. b>>a = | ix. 1<<2 = |
| v. b<<0 = | x. 3>>1 = |

Q3. What is Output of following code? if int a=3, b=6;

- | | |
|--------------------|------------------------|
| i. a/b = | vi. 44%6 = |
| ii. b/a = | vii. a%b%a = |
| iii. a+b/a = | viii. (b>>1)%2 = |
| iv. a-b%a = | ix. 60%(b<<a) = |
| v. b%a+44 = | x. (1<<2)%4 = |

Q4. What is Output of following code? if int a=3, b=6;

- | | |
|--------------------|-----------------------|
| i. a b = | vi. b b 3 = |
| ii. b a = | vii. a&(b) a = |
| iii. a b&a = | viii. a&(b) 4 = |
| iv. b&a b = | ix. a&(a) 5 = |
| v. a a = | x. a&b&a b = |

Q5. Take 8 inputs as binary and store it in a variable using shift operator and print the output.

- | | |
|-------------------------------------|--|
| i. EX: input: 0000 0010 Output: 2 | vi. EX: input: 0000 0010 Output: 2 |
| ii. EX: input: 0000 0110 Output: 6 | vii. EX: input: 1111 1111 Output: 255 |
| iii. EX: input: 0000 0010 Output: 2 | viii. EX: input: 0111 1111 Output: 127 |
| iv. EX: input: 0001 0000 Output: 16 | ix. EX: input: 1000 0000 Output: 128 |
| v. EX: input: 0001 0010 Output: 18 | x. EX: input: 1000 0001 Output: 129 |

Q6. Write a program Swap two number using third variable

Q7. Write a program Swap two numbers without using third variable.

Q8. Write a program to add numbers given by user.(Without any loop).

Q9. Write a program to give power of a number and print the result.

Ex:

Input:

n = 5, p = 3

Output:

125

Questions on if... else...

Q1. A shop keeper is having chocolates of rupees 1, 5, 10, 20, 50 respectively but shop keeper does not has change to give costumer. If costumer is giving 12 rupees to shop keeper so the shop keeper need to give him one chocolate of rupees 10 and 2 chocolates of rupees 1.

Melody	=	1 Rs/-
Dairy Milk	=	5 Rs/-
Kit-Kat	=	10 Rs/-
Milky Bar	=	20 Rs/-
Silk	=	50 Rs/-

Ex:

Input:	63		
Output:	1 Silk	1 Kit-Kat	2 Melody
Input:	165		
Output:	3 Silk	1 Kit-Kat	1 Dairy Milk
Input:	200		
Output:	4 Silk		

Q2. Write a program to print the greatest number using only if.... else....

Ex:

Input:	12	4	8	Input:	-2	0	-55
Output:	12			Output:	0		
Input:	2	0	55	Input:	-2	-2	-2
Output:	55			Output:	-2		
Input:	77	77	77	Input:	2	2	-9
Output:	77			Output:	2		
Input:	2	2	1	Input:	-2	0	-55
Output:	2			Output:	0		
Input:	3	5	3	Input:	2	66	-55
Output:	5			Output:	66		
Input:	-1	-4	5	Input:	7	7	-55
Output:	5			Output:	7		

- Q3. Write a Program to check whether a number is negative, positive or zero.**
Q4. Write a Program to check whether a number is divisible by 5 and 11 or not.
Q5. Write a Program to check whether a number is even or odd.
Q6. Write a Program to check whether a year is leap year or not.

Ex:

Input:

Input year: 2004

Output:

2004 is leap year.

- Q7. Write a Program to check whether a character is alphabet or not.**

Ex:

Input:

Input character: a

Output:

'a' is alphabet

- Q8. Write a Program to input any alphabet and check whether it is vowel or consonant.**

Ex:

Input:

Input character: a

Output

'a' is vowel

- Q9. Write a Program to input any character and check whether it is alphabet, digit or special character.**

Ex:

Input:

Input any character: 3

Output:

3 is digit

- Q10. Write a Program to check whether a character is uppercase or lowercase alphabet.**
Q11. Write a Program to input week number and print week day.
Q12. Write a Program to input month number and print number of days in that month.
Q13. Write a Program to count total number of notes in given amount.

Ex:

Input:

Input amount: 575

Output:

Total number of notes: 500: 1, 100: 0, 50: 1, 20: 1, 10: 0, 5: 1, 2: 0, 1: 0

Q14. Write a Program to input angles of a triangle and check whether triangle is valid or not.

Ex:

Input:

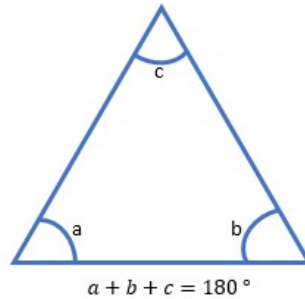
Input first angle: 60

Input second angle: 30

Input third angle: 90

Output:

The triangle is valid



Q15. Write a Program to check whether the triangle is equilateral, isosceles or scalene triangle.

Ex:

- Input sides of a triangle from user. Store it in some variables say side1, side2 and side3.
- Check if(side1 == side2 && side2 == side3), then the triangle is equilateral.
- If it is not an equilateral triangle then it may be isosceles. Check if(side1 == side2 || side1 == side3 || side2 == side3), then triangle is isosceles.
- If it is neither equilateral nor isosceles then it scalene triangle.

Input:

Input first side: 7

Input second side: 10

Input third side: 7

Output:

Triangle is Isosceles

Q16. Write a Program to check whether the triangle is equilateral, isosceles or scalene triangle.

Ex:

Input:

Input first side: 30

Input second side: 30

Input third side: 30

Output:

Triangle is equilateral triangle

Q17. Write a Program to calculate profit or loss.

Ex:

Input:

Input cost price: 1000

Input selling price: 1500

Output:

Profit: 500

Q18. Write a Program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer, calculate percentage and grade according to given conditions:

If percentage $\geq 90\%$: Grade A
If percentage $\geq 80\%$: Grade B
If percentage $\geq 70\%$: Grade C
If percentage $\geq 60\%$: Grade D
If percentage $\geq 40\%$: Grade E
If percentage $< 40\%$: Grade F

Ex:

Input:

Input marks of five subjects: 95
 95
 97
 98
 90

Output:

Percentage = 95.00
Grade A

Q19. Write a Program to input basic salary of an employee and calculate gross salary according to given conditions.

Basic Salary ≤ 10000 : HRA = 20%, DA = 80%

Basic Salary is between 10001 to 20000 : HRA = 25%, DA = 90%

Basic Salary ≥ 20001 : HRA = 30%, DA = 95%

How to calculate gross salary of an employee using if else in C programming. Program to calculate gross salary of an employee using if else in C program. Logic to find gross salary of employee in C program.

For loop

Q1. Print the pattern as given below.

```
*
**
***
****
*****
```

Pyramid pattern

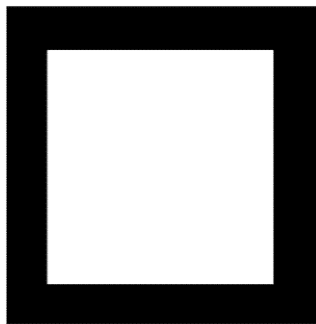
```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

Numeric pattern

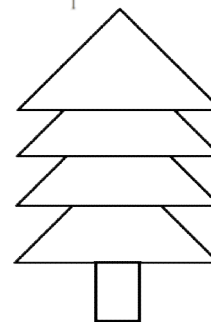
```
1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
1 2 3 4 5 6 5 4 3 2 1
1 2 3 4 5 6 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
1 2 3 4 5 6 5 4 3 2 1
1 2 3 4 5 4 3 2 1
1 2 3 4 3 2 1
1 2 1
1
```

```
*
**
***
****
*****
```

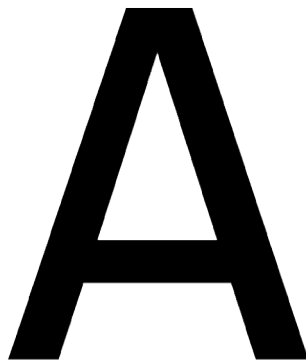
Star pattern



```
0
0 1 0
0 1 2 1 0
0 1 2 3 2 1 0
0 1 2 3 4 3 2 1 0
0 1 2 3 4 5 4 3 2 1 0
0 1 2 3 4 5 6 5 4 3 2 1 0
0 1 2 3 4 5 6 7 6 5 4 3 2 1 0
0 1 2 3 4 5 6 7 6 5 4 3 2 1 0
0 1 2 3 4 5 6 7 6 5 4 3 2 1 0
0 1 2 3 4 5 4 3 2 1 0
0 1 2 3 2 1 0
0 1 2 1 0
0 1 0
0
```



```
7
7 7
7 2 7
7 2 2 7
7 7 7 7 2 3 2 7 7 7 7
7 2 2 2 2 3 3 2 2 2 2 7
7 2 3 3 3 5 3 3 3 2 7
7 2 3 5 5 5 5 3 2 7
7 2 3 5 5 5 5 3 2 7
7 2 3 5 5 5 5 3 2 7
7 2 2 2 2 3 3 2 2 2 2 7
7 7 7 7 7 2 3 2 7 7 7 7 7
7 2 2 7
7 2 7
7 7
7
```



```
1
1 2
1 2 3
1 2 3 4
1
2 2
3 3 3
4 4 4 4
```

```
*
* *
* * *
* * * *
* * * * *
```

```
*
* *
* * *
* * * *
* * * * *
```

```
*
* *
* * *
* * * *
* * * * *
```

```
*
* *
* * *
* * * *
* * * * *
```

Q2. Write a Program to find the sum of first 10 natural numbers.

Expected Output :

The first 10 natural number is :

1 2 3 4 5 6 7 8 9 10

The Sum is : 55

Q3. Write a program in C to display n terms of natural number and their sum.

Test Data : 7

Expected Output :

The first 7 natural number is :

1 2 3 4 5 6 7

The Sum of Natural Number up-to 7 terms : 28

Q4. Write a program in C to read 10 numbers from keyboard and find their sum and average.

Test Data :

Input the 10 numbers :

Number-1 :2

...

Number-10 :2

Expected Output :

The sum of 10 no is : 55

The Average is : 5.500000

Q5. Write a program in C to display the cube of the number up-to given an integer.

Test Data :

Input number of terms : 5

Expected Output :

Number is : 1 and cube of the 1 is :1

Number is : 2 and cube of the 2 is :8

Number is : 3 and cube of the 3 is :27

Number is : 4 and cube of the 4 is :64

Number is : 5 and cube of the 5 is :125

Q6. Write a program to display below table.

2	4	6	8	10	12	14	16	18	20
---	---	---	---	----	----	----	----	----	----

5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60

3	4	5
6	8	10
9	12	15
12	16	20
15	20	25
18	24	30
21	28	35
24	32	40
27	36	45
30	40	50

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

Q7. Write a program to display the n terms of odd natural number and their sum.

Test Data

Input number of terms : 10

Expected Output :

The odd numbers are :1 3 5 7 9 11 13 15 17 19

The Sum of odd Natural Number up-to 10 terms : 100

Q8. Write a program to calculate the factorial of a given number.

Test Data :

Input the number : 5

Expected Output :

The Factorial of 5 is: 120

Q9. Write a program to display the n terms of even natural number and their sum.

Test Data :

Input number of terms : 5

Expected Output :

The even numbers are :2 4 6 8 10

The Sum of even Natural Number up-to 5 terms : 30

Q10. Write a program to find the sum of the series [$1 - X^2/2! + X^4/4! - \dots$].

Test Data :

Input the Value of x :2

Input the number of terms : 5

Expected Output :

the sum = -0.415873

Number of terms = 5

value of x = 2.000000

Q11. Write a program to display the n terms of harmonic series and their sum.

$1 + 1/2 + 1/3 + 1/4 + 1/5 \dots 1/n$ terms

Test Data :

Input the number of terms : 5

Expected Output :

$1/1 + 1/2 + 1/3 + 1/4 + 1/5 +$

Sum of Series up-to 5 terms : 2.283334

Q12. Write a program to display the sum of the series [$9 + 99 + 999 + 9999 \dots$].

Test Data : Input the number or terms :5

***Expected Output :* 9 99 999 9999 99999 -- The sum of the series = 111105**

Q13. Write a program to print the Floyd's Triangle.

```
1
01
101
0101
10101
```

Q14. Write a program to find the sum of the series 1 +11 + 111 + 1111 + .. n terms.

Test Data :

Input the number of terms : 5

Expected Output :

1 + 11 + 111 + 1111 + 11111

The Sum is : 12345

Q15. Write a program to check whether a given number is a perfect number or not.

Test Data:

Input the number: 56

Expected Output:

The positive divisor: 1 2 4 7 8 14 28

the sum of the divisor is: 64

so, the number is not perfect.

Perfect Number

Divisor of 28 : 1, 2, 4, 7, 14, 28

Sum of 1 + 2 + 4 + 7 + 14 = 28

Sum = Original Number

28 is Perfect number

Q16. Write a program to find the perfect numbers within a given number of range.

Test Data :

Input the starting range or number : 1

Input the ending range of number : 50

Expected Output :

The Perfect numbers within the given range : 6 28

Q17. Write a program to check whether a given number is an Armstrong number or not.

Test Data:

Input a number: 153

Expected Output:

153 is an Armstrong number.

Q18. Write a program to find the Armstrong number for a given range of number.

Test Data :

Input starting number of range: 1

Input ending number of range : 1000

Expected Output :

Armstrong numbers in given range are: 1 153 370 371 407

Q19. Write a program to determine whether a given number is Prime or not.

Test Data:

Input a number: 13

Expected Output:

13 is a prime number.

Q20. Write a program to display triangle. A

Test Data :

Input number of rows: 5

Expected Output :

A

AB

ABC

ABCD

ABCDE

```

Enter the number of rows: 8
A
A B C
A B C D E
A B C D E F G
A B C D E F G H I
A B C D E F G H I J K
A B C D E F G H I J K L M
A B C D E F G H I J K L M N O

```

Q21. Write a program to find the prime numbers within a range of numbers.

Test Data:

Input starting number of range: 1

Input ending number of range : 50

Expected Output :

The prime number between 1 and 50 are :

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47

Q22. Write a program to display the first n terms of Fibonacci series.

Fibonacci series 0 1 2 3 5 8 13

Test Data :

Input number of terms to display : 10

Expected Output :

Here is the Fibonacci series upto to 10 terms :

0 1 1 2 3 5 8 13 21 34

Q23. Write a program in C to display the number in reverse order.

Test Data :

Input a number: 12345

Expected Output :

The number in reverse order is : 54321

Q24. Write a program in C to check whether a number is a palindrome or not.

Test Data :

Input a number: 121

Expected Output :

121 is a palindrome number.

Q25. Write a program in C to convert a decimal number into binary without using an array.

Test Data :

Input a decimal number: 25

Binary number equivalent to said decimal number is: 0000000000000000000000000001 1001

Q26. Write a program in C to convert a binary number into a decimal number without using array, function and while loop.

Test Data :

Input a binary number :1010101

Expected Output :

The Binary Number : 1010101

The equivalent Decimal Number : 85

Q27. Write a Program to find HCF (Highest Common Factor) of two numbers.

Test Data :

Input 1st number for HCF: 24

Input 2nd number for HCF: 28

Expected Output :

HCF of 24 and 28 is : 4

Q28. Write a program in C to find LCM of any two numbers using HCF.

Test Data :

Input 1st number for LCM: 15

Input 2nd number for LCM: 20

Expected Output :

The LCM of 15 and 20 is : 60

Q29. Write a program in C to find LCM of any two numbers.

Test Data :

Input 1st number for LCM: 15

Input 2nd number for LCM: 20

Expected Output :

The LCM of 15 and 20 is : 60

Q30. Write a program in C to convert a binary number into a decimal number using math function.

Test Data :

Input the binary number :1010100

Expected Output :

The Binary Number : 1010100

The equivalent Decimal Number is : 84

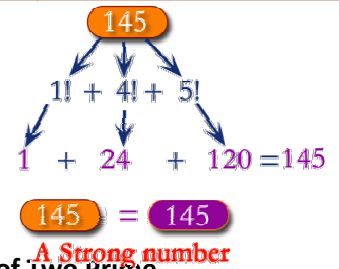
Q31. Write a Program to check whether a number is a Strong Number or not.

Test Data:

Input a number to check whether it is Strong number: 15

Expected Output :

15 is not a Strong number.



Q32. Write a program in C to Check Whether a Number can be express as Sum of Two Prime Numbers.

Test Data :

Input a positive integer: 16

Expected Output :

16 = 3 + 13

16 = 5 + 11

Q33. Write a program in C to print a string in reverse order.

Test Data :

Input a string to reverse : Welcome

Expected Output :

Reversed string is: emocleW

Q34. Write a program in C to check Armstrong number of n digits.

Test Data :

Input an integer : 1634

Expected Output :

1634 is an Armstrong number

Q35. Write a Program to find the length of a string without using the library function.

Test Data :

Input a string : welcome

Expected Output :

The string contains 7 number of characters.

So, the length of the string welcome is : 7

Numbers

Q1. Sum of digits:

Input: 4562

Output: 17

Input: 432

Output: 9

Q2. Write a program to find HCF (GCD) of two numbers.

Input: first number: 12

Input second number: 30

Output: HCF of 12 and 30: 6

Q3. program to find cube of a number using function

Input: Input any number: 5

Output: Cube of 5 is: 125

Q4. Write a program to check whether a number is prime, Armstrong or perfect number using functions.

Input: Input any number: 5

Output: Cube of 5 is: 125

Q5. Write a program to find all prime numbers between given interval.

Q6. Write a program to find all Strong numbers between given interval.

Q7. Write a program to find all Arm strong numbers between given interval.

Q8. Write a program to find all Perfect numbers between given interval.

Q9. Write a program to find power of any numbers given by user.

Q10. Write a program to find reverse of any numbers given by user.

Q11. Write a program to find nth Fibonacci term.

Q12. Write a program to find LCM of two numbers given by user.

Q13. Write a program to count numbers of digits in a number given by user.

Q14. Write a program to find first and last digit of any number given by user.

Q15. A program to find sum of first and last digit of any number given by user.

Q16. Write a program to swap first and last digit of number given by user.

Q17. A program to find the frequency of each digit in numbers given by user.