

ASSIGNMENT

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Algorithm

Q1) Check if the given number is even or odd ?

Start

- 1) Enter the number to be evaluated
- 2) Run a if conditional statement with the following condition
→ if ($\text{num} \% 2 == 0$)
→ if true number is even
→ Else print number is odd
- 3) Exit

Q2) Write a Java program to find the factorial of a given number

- 1) Start
- 2) Enter the number
- 3) logic :- Run a for loop starting from 1 to number
→ factorial = factorial * i where i is the iterating value
Starting from 1 to number
- 4) print variable factorial
- 5) exit

Q3) Find the factorial of a number Using Recursion ?

- 1) Start
- 2) Enter the number
- 3) Create a static method which takes number as argument
- 4) if number is 0 return 1
else return ($n * \text{factorial}(n-1)$)
- 5) Create an variable factorial which stores the returned value from the method
- 6) Print variable factorial
- 7) Stop

Q4) Swap two numbers without using the third variable
approach:-

- 1) Start
- 2) Enter the two numbers x, y
- 3) logic = $x = x + y$
 $y = x - y$
 $x = x - y$
- 4) printout the value of x, y after swapping
- 5) Stop.

Q5) How to check whether the given number is positive or negative in java?

- 1) Start
- 2) Enter the number
- 3) logic \Rightarrow Run a if conditional statement
`if (number >= 0)`
 print the number is positive
else
 print the number is negative
- 4) Stop

Q6) Write a program to find whether a given number is leap year or not?

- 1) Start
- 2) Enter the year to be checked
- 3) Run an if statement


```
if year % 4 == 0 { if not print not a leap year }
```

go inside if statement (nested)

again run if statement

```
if year % 100 == 0 { if not print year is not leap year }
```

then go inside another if statement

```
if year % 400 == 0 { if not print not a leap year }
```

print it is leap year
- 4) Stop

Q7) Write a program to print 1 to 10 without loop :-

- 1) Start
- 2) We will do a recursive method
- 3) Create a method which takes number n as argument
(eg. printNos(~~int~~ n))
- 4) if ($n > 0$)
- 5) printNos ($n - 1$)
- 6) print ($n + " "$)
- 7) Stop

Note:- print function after a recursion call prints number in the same order of function call.

print fun before recursion prints number in reverse order

Q9) Write a java program to print all the factors of the given number.

1) Start

2) Enter the number to find its factors

3) Run a for loop

```
for (int i=1; i<=num; i++)  
    if (number % i == 0)
```

4) print i

5) exit loop

6) Stop

Q10) write a java program to find the sum of the digits of a given number.

1) Start

2) read the number

3) find the last digit by using % operator

$$\text{temp} = N \% 10$$

$$\text{sum} = \text{sum} + \text{temp}$$

$$N = N / 10$$

4) repeat the logic till N becomes 0

5) print sum

6) Stop

(Q1) Write a java program to find the smallest of 3 numbers a, b, c

Sol → 1) Start

2) Enter 3 numbers a, b, c

3) Create variable smallest = 0 [Initialize]

4) run if conditional statements

if ($a < b \& a < c$)

smallest = a

else if ($b < a \& b < c$)

smallest = b

else smallest = c

5) print smallest

6) Stop

(Q2) How to add two numbers without using the arithmetic operators in java

1) Start

2) Enter two numbers a & b

3) running a while loop with condition
while ($b > 0$)

a++

b--

4) Come out of loop

5) Print a

(Q13) Write a java program to reverse a given number

- 1) Start
- 2) Enter number to be reversed
- 3) run a while loop
- 4) while ($\text{num} > 0$)
 $\text{remainder} = \text{num} \% 10$
 $\text{rev} = \text{rev} * 10 + \text{remainder}$
 $\text{num} = \text{num} / 10$
- 5) Exit loop
- 6) print rev
- 7) Stop.

(Q14) Write a java program to find the gcd of two numbers

- 1) Start
- 2) Enter two numbers a & b
- 3) Run a for loop

```
for (int i=1; i<=a & i<=b; i++)  
if (a%i==0 & b%i==0)  
gcd=i
```
- 4) Exit loop
- 5) print gcd
- 6) Stop.

Q15) Write a Java program to find LCM of two numbers

- 1) Enter two numbers
- 2) Initialize variable $LCM = 0$, $gcd = 0$
- 3) run a for loop

$$\text{for (int } i=1; i \leq a \& i \leq b; i++)$$

$$\text{if } (a \% i == 0 \& b \% i == 0)$$

$$gcd = i$$
- 4) exit loop
- 5) $LCM = (a * b) / gcd$
- 6) print LCM
- 7) stop.

Q16) Write a Java program to find LCM of two given numbers using the prime factors method

- 1) Start
- 2) Enter the two numbers
- 3) find all the prime factors of each numbers a & b
- 4) list all the prime factors found, as many times as they occur most often for any one given number
- 5) Multiply the list of prime factors together to find the LCM

17 Q) Check whether the given number is a palindrome or
Not?

Sol⇒

- 1) Start
- 2) Enter a number a
- 3) Store the value of a in another variable temp
- 4) Create another rev and h variable initialize it to 0
- 5) running a while loop with condition
 $\text{while } (a > 0)$
 $h = a \% 10$
 $\text{rev} = \text{rev} * 10 + h$
 $a = a / 10$
- 6) run a if conditional statement after
while loop exits
- 7) if ($\text{temp} == \text{rev}$)
- 8) print it is a palindrome
- 9) else
- 10) print the number is not a
palindrome.

18 Q)

Write a Java program to print all the prime factors of the given no :-

Sol→

1) Enter the number

2) Run a for loop

→ int i=2; i<=num/2; i++

if (num % i == 0)

CheckPrime(i, num) → call a function CheckPrime

↳ number entered

↳ number to be checked

3) Run checkPrime (int n, int num)

→ int i, m=0, flag=0

m=n/2

→ for (i=2; i<=m; i++)

if (n % i == 0)

flag = 1

break

exit for loop

→ if (flag == 0)

→ print ("n is prime factor of num")

4) Return to main

5) Stop

Q19) To print the following series Even numbers series

2 4 6 8 10 12 14 16

- 1) Start
- 2) enter the number n till where the series will go
- 3) run a for loop
- 4) `for (int i=0; i<=20; i++)`
- 5) `if (i%2==0)`
- 6) `print(i)`
- 7) Exit loop
- 8) Stop

Q20) To print the following series odd numbers

13 5 7 9 11 13 ...

- 1) Start
- 2) enter the number to find the range of the series
print n
- 3) running a for loop
`for (int i=0; i<=20; i++)`
`if (i%2 != 0)`
`print (" " + i);`
- 4) Exit loop
- 5) Stop.

8) Write a Java program to print the digits of a given Number.

Sol-) Algorithm :-

- 1> Start
- 2> Enter the number to extract digit
- 3> if (number > 0)

 remainder = number % 10

 print (remainder)

 number = number / 10;

- 4> End