

Tutorial 08:-
Answer all questions.

Q1) The largest number can divide two or more integers without leaving any remainder value.
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Also known as the highest as the highest common factor HCF

Q2) Briefly explain Greatest Common Divisor GCD.

Highest common factor is a mathematical concept used to find the largest positive integer that divides two or more numbers without leaving a remainder.

Q3) Explain the step of the Euclidean Algorithm.

Start with two given integers, let's call them 'a' and 'b', where 'a' is typically the larger number.



Divide 'a' by 'b' and take the remainder. Let's call this remainder 'r'.



If the remainder 'r' is zero, then the algorithm stops, and the GCD is equal to the value of 'b'. In this case, 'b' is the largest number that divides both 'a' and 'b' without leaving a remainder.



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if the remainder ' r ' is not zero, then
set ' a ' equal to ' b ' and ' b ' equal to ' r '.

repeat steps 2 to 4 using the updated
values of ' a ' and ' b '.

continue this process of dividing ' a ' by
' b ' and taking the remainder until the
remainder becomes zero.

Once the remainder becomes zero, the
algorithm stops, and the GCD is equal to
the last non-zero remainder, which is the
value of ' b '.

- as parameters of the algorithm. It takes two numbers as number 1 and number 2 where number 1 is always the greater value.
- If number 2 is equal to 0 the GCD value will be returned as number 1.
- else the GCD (number 1, number 2) \rightarrow GCD (number 2, GCD (number 1 % number 2))

Q-03) What is the defined by prime factorization?

- finding out the prime numbers that divided a given number without leaving a remainder.

Q-04) Try to use the iteration to get the same results public class Iterative GCD.

public class IterativeGCD

{

public static void main (String [] args)

{

int num1 = 120;

int num2 = 35;

System.out.print ("GCD (" + num1 + " " + num2 + ")
= ");

System.out.print (gcd (num1, num2));

}

public static int gcd (int num1, int num2)

{

while (num2 != 0)

{

int temp = num1 % num2;

num1 = num2;

num2 = temp;

}

return num1;

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Ques) Write a function using pseudo or source code to find out the GCD using recursively.

```
public class RecursiveGCD
```

```
{
```

```
public static void main(String[] args)
```

```
{
```

```
int num1 = 120;
```

```
int num2 = 35;
```

```
System.out.print("GCD (" + num1 + ", " + num2 +  
= ")");
```

```
System.out.print(gcd(num1, num2));
```

```
}
```

```
public static int gcd(int num1, int num2)
```

```
{
```

```
if (num2 == 0)
```

```
{
```

```
return num1;
```

```
}
```

```
return gcd(num2, num1 % num2);
```

```
}
```

```
}
```

Q-5 (b) Geographically represent how to identify the prime factorization.

ex-3



