```java
int gcd (int x, int y){
	if (y==0) {

		return x;
	}

	if (x>=y && x !=0)  {

		return gcd(y,x%y);
	}

	System.out.println("cannot be created");
	return 0;
}
```

Big O

O (GCD) = 1 (n) 1 (log(n)) 1

O(GCD) = n + 1 (log(n) 1

O(GCD) = n+(log(n)1

O(GCD) = n+1

Linear logarithmic

```
int Ack(int x, int y) {

                if (x == 0) {
                 return 2 * y;
                } else if (x >= 1) {
                 if (y == 0) {
                  return 0;
                 } else if (y == 0) {
                  return 2;
                 } else {
                  return Ack(x - 1,     Ack(x, y - 1));
                 }
                }
                return y;
               }
```

Big O (Ack) = 1+log(n) 1+(1(1+1)1(1)(1+1)1)

= 1 + log(n) 1(2)+1(2)1

= 1 + log(n)2+2

= 1+log(n) 4

= 1+log(n) 0

= log(n)