Recursive GCD

```
#include <stdio.h>
int gcd (int x, int y);
int main()
{
    int x, y
    printf ("Enter the first number \n");
    scanf ("%d", &x);
    printf ("Enter second number \n")
    scanf ("%d", &y);
    int ans = gcd(x, y)
    printf ("GCD = %d", ans);
}
int gcd (int x, int y)
{
    int rem,
    int temp
    if (x>y)
    {
        rem = x % y;
    }
    else
    {
        temp = y
        y = x
        x = temp
        rem = x % y
    }
    if (rem==0)
    {
    return y;
    }
```

```
else
{
  return gcd(y, rem);
}
}
```

Linear GCD

```
#include<stdio.h>
int gcd(int x, int y)
int main()
{
   int x, y
   printf("first number\n");
   Scanf("%d", &x);
   print("second number\n");
   Scanf("%d", &y);
   int ans= gcd(x, y)
   printf("GCD is %d\n", ans);
}
int gcd(int x, int y)
{
   int rem, temp
   if (x>y)
   {
     rem = x % y;
   }
   else
   {
     temp = x
     x = y
     y = temp
     rem = x % y;
   }
```

```
if (rem == 0)
    return y
}
else
{
    while (rem != 0)
    {
        x = y
        y = rem
        rem = x % y
    }
    return y
}
```

Linear & Binary Searched

```
#include <stdio.h>
#include <stdlib.h>
int linear (int a[], int l, int r, int key)
{
  if (r<l)
    return -1;
  if (a[l] == key)
    return l;
  if (a[r] == key)
    return r;
return linear (a, l+1, r-1, key);
}
 int binary (int a[], int first, int last, int key)
 {
   if (last >= first)
   {
    int m = first + (last - first)/2;
    if (a[m] == key){
      return m;
    }
    if (a[m] > key){
    return binary (a, m+1, last, key);
   }
   return -1;
 }
   int main()
   {
    int a[200], i, choice, key, n, res;
  Printf(" Enter the size of the array :");
  Scanf("%d", &n);
  Printf(" Enter the values of array in ascending order:");
```

```
for(i=0 ; i<n ; i++)
   scanf("%d", &a[i]);
}
for(;;){
 printf("Enter the value to find \n");
 scanf("%d", &key);
printf(" 1: Linear search \n2: Binary search \n3: Exit\n");
scanf("%d", &choice);
switch(choice){
  case 1: printf("Linear search : \n");
    res = linear(a, 0, n-1, key);
   if(res != -1){
    printf("%d is present at location %d", key, res+1);
   }
   else {
    printf("%d is not present ", key);
    break;
case 2: printf("Binary search:\n");
    res = binary(a, 0, n-1, key);
   if(res != -1){
   printf("%d is not present in the list \n", key);
   }
   else {
    printf("%d is found at location %d\n", key,
                                    res+1);
   }
 default : exit(0);
   }
   }
   }
```