1. FACTORIAL

```
#include <stdio.h>
#include <stdlib.h>
int fact(int n);
int main()
{ int n;
  printf("Enter a positive integer");
  scanf("%d", &n);
  while(n < 0){
  printf("Enter a positive number");
  scanf("%d", &n); }
  printf("Factorial of %d is %d\n", n, fact(n));
  return 0; }
int fact(int n)
{ if(n >= 1)
    return n * f(n-1);
  else
    return 1;
}
```

Sample output:

Enter a positive integer:
3
Factorial of 3 is 6

2. HCF

```
#include <stdio.h>
#include <stdlib.h>
int hcf(int n1, int n2);
int main(){
printf("Enter two positive numbers: ");
scanf("%d %d", &n1, &n2);
printf("G.C.D of %d and %d is %d", n, n2, hcf(n1, n2));
return 0; }
int hcf(int n1, int n2){
    if(n2 != 0)
      return hcf(n2, n1 % n2);
    else
      return n1; }
```

Sample output

Enter two numbers: 6 5
G.C.D of two no is 1

3. TOWER OF HANOI

```
#include<stdio.h>
#include<stdlib.h>
void towerofhanoi(int n, char from_rod, char to_rod, char aux_rod)
{   if (n==1)
    {  printf("\n Move disk 1 from rod %c to rod %c", from_rod
       return; }                                        , to_rod);

towerofhanoi (n-1, from_rod, aux_rod, to_rod);
printf("\n Move disk %d from rod %d to rod %c ", n, from_rod, to_rod);
towerofhanoi (n-1, aux_rod, to_rod, from_rod); }

int main()
{  int n;
   printf("Enter numbes of disks \n");
   scanf("%d", &n);
   towerofhanoi (n, 'A', 'C', 'B');
   return 0; }
```

4.

```
#include<stdio.h>
#include<stdlib.h>
int fib(int n)
{  if (n<=1)
       return n;
   return fib(n-1) + fib(n-2); }

int main()
{  int n;
   printf("Enter numbes of terms \n");
   printf("%d", fib(n));
   return 0; }
```

Output sample

Enter number of terms 5

5

5.
```
#include <stdio.h>
#include <stdlib.h>
int binarysearch(int arr[], int l, int r, int x)
{ if (r >= l)
  { int mid = l + (r - l) / 2; }
   if (arr[mid] == x) return mid;
   if (arr[mid] > x) return binarysearch(arr, i, mid-1, x);
   return binarysearch( arr, mid+1, r, x); }
  return -1; }

int main(){
   int arr[50];
   int n, i, x;
   printf(" Enter size of array\n");
   scanf(" %d", &n);
   for (i=0, i<n; i++)
   { scanf("%d", &arr[i]);}
  printf(" Enter number to search\n");
  scanf(" %d", &x);
  int result = binary search( arr, 0, n-1, x);
(result == -1) ? printf("Element is not in array") :
                 printf(" Element is present at %d index\n", result);

  return 0; }
```

Sample output:

```
Enter size of array: 5
Enter elements:
1
2
3
4
5
Enter number to search: 3
The 3 is present at 2 index
```