ARCHANA KUMARI **Assignment - 5**

ROLL – 408

ECE

```c
//1
#include <stdio.h>

int sum2(int num1, int num2) {
  return num1 + num2;
}

void main() {
  printf("Enter n1 = ");
  int num1 = 0;
  scanf("%d", &num1);

  printf("Enter n2 = ");
  int num2 = 0;
  scanf("%d", &num2);

  printf("Enter n3 = ");
  int num3 = 0;
  scanf("%d", &num3);

  printf("%d + %d + %d = %d",num1, num2, num3, sum2(sum2(num1, num2), num3));
}
```

```
C:\Users\MYPC\Documents\Project1.exe
Enter n1 = 3
Enter n2 = 43
Enter n3 = 57
3 + 43 + 57 = 103
--------------------------------
Process exited after 18.29 seconds with return value 17
Press any key to continue . . .
```

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```c
//2
#include <stdio.h>

int digitSum(int n) {
 int sum = 0;
 while(n) {
   sum += n % 10;
   n /= 10;
 }
 return sum;
}

void main() {

printf("Enter the number: ");
int num = 0;
scanf("%d",&num);

printf("Digits_Sum = %d", digitSum(num));
}
```

```
C:\Users\MYPC\Documents\Project1.exe
Enter the number: 34765
Digits_Sum = 25
--------------------------------
Process exited after 10.54 seconds with return value 15
Press any key to continue . . .
```

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```c
//3
#include <stdio.h>
void Sieve(int start, int end) {
int prime[end];
int i = 0, j = 0;
for(i = 0; i < end; i++)
  prime[i] = 0;
for(i = 2; i <= end; i++){
  if(prime[i] == 0){
    for(j = i * i; j <= end; j += i)
       prime[j] = 1;
    }
  }
 printf("The prime numbers within the range [%d,%d] is: ", start, en
d);
   for(i=2; i<=end; i++){
     if(prime[i]==0  && i>=start && i<=end)
       printf("%4d", i);
  }
}

void main() {
  printf("Enter 2 numbers: ");
  int start = 0, end = 0;
  scanf("%d%d", &start, &end);
  start -= (start < 0) * 2 * start;
  end -= (end < 0) * 2 * end;
  if(start > end){
     start ^= end;
     end ^= start;
     start ^= end;
  }
  Sieve(start, end);
}
```

```
C:\Users\MYPC\Documents\Project1.exe
Enter 2 numbers: 1 20
The prime numbers within the range [1,20] is:    2   3   5   7  11  13  17  19
--------------------------------
Process exited after 3.494 seconds with return value 21
Press any key to continue . . .
```

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```c
//4.Program to find factorial from 0 to 10.
#include <stdio.h>
int factorial(int n) {
  if (n == 0)    //edge case
     return 1;
  int f = 1;
  while (n)      //loop for factorial calculation
    f *= n--;
    return f;
}
int main() {
int i = 0;
for(i = 0; i < 11; ++i)
  printf(" %d! = %d\n", i, factorial(i));
return 0;
}
```

```
 0! = 1
 1! = 1
 2! = 2
 3! = 6
 4! = 24
 5! = 120
 6! = 720
 7! = 5040
 8! = 40320
 9! = 362880
 10! = 3628800

--------------------------------
Process exited after 0.406 seconds with return value 0
Press any key to continue . . .
```

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```c
//5.Calculate factorial using reursion.
#include <stdio.h>

int factorial(int n) {
   if (n == 1 || n == 0)  //base case
      return 1;
    return (n * factorial(n-1));  //recursive step
}

void main() {
printf("Enter n: ");
int n;
scanf("%d", &n);
printf("n! = %d", factorial(n));  //fxn calling
}
```

```
Enter n: 7
n! = 5040
--------------------------------
Process exited after 1.929 seconds with return value 9
Press any key to continue . . .
```

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```c
//6. GCD via Recursion
#include <stdio.h>

int GCD(int num1, int num2) {
 if (num2)
   return GCD(num2, (num1 % num2));  //recursive step
return num1;
}

void main() {
printf("Enter n1: ");
int num1 = 0;
scanf("%d", &num1);

printf("Enter n2: ");
int num2 = 0;
scanf("%d", &num2);

printf("GCD = %d", GCD(num1, num2));
}
```

```
Enter n1: 6
Enter n2: 3
GCD = 3
--------------------------------
Process exited after 11.02 seconds with return value 7
Press any key to continue . . .
```

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```c
//7.Example to show pass by value and pass by reference
#include <stdio.h>
//Pass by reference: the actual values of the variables gets swapped.
void swapRef(int *a, int *b) {
  *a ^= *b;
  *b ^= *a;
  *a ^= *b;  }
//Pass by value: the actual value of variables remains unchanged.
void swapVal(int a, int b) {
 printf("Before swap :  a = %d , b = %d\n", a, b);
 a ^= b;
 b ^= a;
 a ^= b;
 printf("After swap:  a = %d , b = %d\n", a, b);  }
void main() {
printf("Enter num1 = ");  //input for number_1
int num1 = 0;
scanf("%d", &num1);
printf("Enter num2 = ");  //input for number_2
int num2 = 0;
scanf("%d", &num2);
swapVal(num1, num2);     //pass by value
swapRef(&num1, &num2);   //pass by reference
printf("\nAfter Swap:  a = %d , b = %d\n", num1, num2);   }
```

```
Enter num1 = 5
Enter num2 = 7
Before swap :   a = 5 , b = 7
After swap:   a = 7 , b = 5

After Swap:   a = 7 , b = 5

--------------------------------
```

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```c
//8. program to differentiate between static, auto and
 global.
#include <stdio.h>
//global variable declared globally
int g = 56784567;
void autoStatic() {
 auto int a = 0;
 static s = 0;
 printf("auto a = %d , static s = %d", a++, s++);
}
void main() {
int i = 0;
for (; i < 5; ++i)
  autoStatic();
printf("global g = %d\n", g);
}
/*
An auto variable is called each time when the function is called and
 destroyed when the program's execution leaves the function.
Static is declared once and destroys once when the program's
execution finishes.
*/
```

```
 global g = 56784567archana9430@DESKTOP-FDVHB9P:~/sem2/atanu$ vim auto.static.c
 archana9430@DESKTOP-FDVHB9P:~/sem2/atanu$ gcc -o auto.static auto.static.c
 archana9430@DESKTOP-FDVHB9P:~/sem2/atanu$ ./auto.static
  a = 0 , s = 0
  a = 0 , s = 1
  a = 0 , s = 2
  a = 0 , s = 3
  a = 0 , s = 4
 global g = 56784567
 archana9430@DESKTOP-FDVHB9P:~/sem2/atanu$
```

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