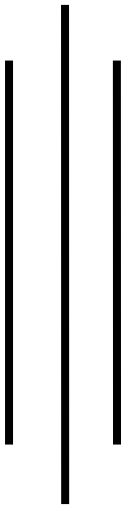
Tribhuvan University
Institute of Engineering
Purwanchal Campus
LAB Sheet



C Lab Report Submitted By:

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LAB SHEET NO.6 [To be familiar with FUNCTIONS:]

1. Write a program to add, subtract, multiply and divide two integers using user defined function add(), sub(), mul() and div().

Code:

```
#include <stdio.h>
int add (int a,int b){
return a +b;
}
int sub (int a,int b){
return a-b;
}
int mul (int a,int b){
return a*b;
}
int div (int a,int b){
return a/b;
}
int main()
{
   int a , b;
   printf("Enter the numbers");
   scanf("%d %d", &a,&b);
   printf("The sum is %d\n",add(a,b));
   printf("The subtraction is %d\n",sub(a,b));
   printf("The multiplication is %d\n",mul(a,b));
   printf("The division is %d",div(a,b));
   return 0;
}
```

Output:

Enter the numbers4 2

The sum is 6

The subtraction is 2

The multiplication is 8

2. WAP to display sum of series: $x + x^2/2! + x^3/3! + x^4/4! + x^5/5! ... xn/n!$. User defined function factorial() and power() should be used to calculate the factorial and power.

Code:

```
#include <stdio.h>
double power(double x, int i) {
    double result = 1.0;
    if (i >= 0) {
        for (int j = 0; j < i; j++) {
            result *= x;
        }
    } else {
        for (int j = 0; j > i; j--) {
            result /= x;
        }
    }
    return result;
}
long factorial(int n) {
    if (n == 0)
        return 1;
    else
        return n * factorial(n - 1);
}
int main() {
    int n,x;
    double sum = 0.0;
    printf("Enter the number of elements in the series: ");
    scanf("%d", &n);
    printf("Enter the value of x: ");
    scanf("%d", &x);
    for (int i = 1; i <= n; i++) {
        sum += power(x, i) / factorial(i);
    }
    printf("The sum of the series is %f\n", sum);
    return 0;
}
```

Output:

Enter the number of elements in the series: 5
Enter the value of x: 2
The sum of the series is 6.266667

3. WAP to calculate factorial using Recursion.

Code:

```
#include <stdio.h>
    long factorial (int n){
   if(n==0)
   return 1;
   else
   return n*factorial(n-1);
}
int main()
{
    int n,result;
    printf("Enter the number to find the factorial :\n");

 scanf("%d", &n);
 result= factorial(n);
 printf("The factorial of %d is %d",n,result);
    return 0;
}
```

Output:

```
Enter the number to find the factorial :
7
The factorial of 7 is 5040
```

4. WAP to display the nth Fibonacci number using recursion.

Code:

```
#include <stdio.h>

int fibonacci(int n) {
   if (n <= 1)
      return n;
   else
      return fibonacci(n - 1) + fibonacci(n - 2);
}
int main() {
   int n;
int i;

   printf("Enter the number of terms: ");
   scanf("%d", &n);


   printf("Fibonacci series up to %d terms:\n", n);

   for (i = 0; i < n; ++i) {
      printf("%d ", fibonacci(i));
   }
   return 0;
}
```

Output:

```
Enter the number of terms: 7
Fibonacci series up to 7 terms:
0 1 1 2 3 5 8
```

5. WAP to take two numbers in main(). Write a function Swap() to swap the values of the variables. Print the swapped values in main().

Code:

```
#include <stdio.h>
void swap(int *a,int *b){
   int temp;
   temp = *a;
   *a = *b;
   *b=temp;
}
int main()
{
   int  a =10;
   int b = 69;
   printf("Before swapping a=%d and b = %d\n",a,b);
   swap(&a,&b);
    printf("After swapping a=%d and b = %d\n",a,b);
   return 0;
}
```

Output:

Before swapping a=10 and b = 69
After swapping a=69 and b = 10

6. WAP to take two float number in main(). Write a function single user define function calculator() to perform the addition, subtraction and multiplication. The sum,difference and product should be displayed from the main() function [Use theconcept of pass by reference.

Code:

```
#include<stdio.h>
float calculator(float *a,float *b,float *sum,float *diff, float *product){
    *sum=*a+*b;
    *diff=*a-*b;
    *product=*a * *b;
}
int main(){
    float a,b,sum,diff,product;
    printf("Enter the value of  a and b:");
    scanf("%f%f",&a,&b);
     calculator(&a,&b,&sum,&diff,&product);
    printf("Sum=%f\n Difference=%f\n product=%f",sum,diff,product);
    return 0;
}
```

Output:

```
Enter the value of  a and b:5 10
Sum=15.000000
 Difference=-5.000000
 product=50.000000
```

7. WAP to input a integer number in main(). Write a user define function is Prime() to calculate whether the number is prime of not. Print whether the number is prime or not from the main().

Code:

```
#include <stdio.h>
int isPrime(int n){
    int flag=0;
    if (n ==0 || n==1){
        flag=1;
    }else {
        for (int i =2 ; i <=n/2; i++){
            if (n%i==0){
                flag++;
                break;
            }
        }
    }
return flag;
}
int main()
{
    int n, result;
    printf("Enter the number to check weather it is prime or not");
    scanf("%d", &n);
    result= isPrime(n);
    if (result==0){
        printf("%d is prime number",n);
    }else {
        printf("%d is not a prime number",n);
    }
    return 0;
}
```

Output:

```
Enter the number to check weather it is prime or not8
8 is not a prime number
```

8. WAP to illustrate the concept of global and static variables.

Code:

```
#include <stdio.h>
   int a=10,b=10;
   void func_1(){
      printf("From Function-1 a = %d and b = %d\n",a,b);
   }
   void func_2(){
      a=25;
      b=30;
     printf("From Function-2 a = %d and b = %d\n",a,b);
   }
void incrementStatic() {
   // Declare a static variable
   static int count = 0;

   // Increment the static variable and print its value
   count++;
   printf("Static variable count: %d\n", count);
}

int main()
{
   printf("Form main function a =%d and b = %d\n",a,b);
   func_1();
   func_2();
   a=20;
   func_1();
 // Call the incrementStatic function multiple times
    for (int i = 0; i < 5; i++) {
   incrementStatic();
   }
   return 0;
}
```

Output:

```
Form main function a =10 and b = 10
From Function-1 a = 10 and b = 10
From Function-2 a = 25 and b = 30
From Function-1 a = 20 and b = 30
```