

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:

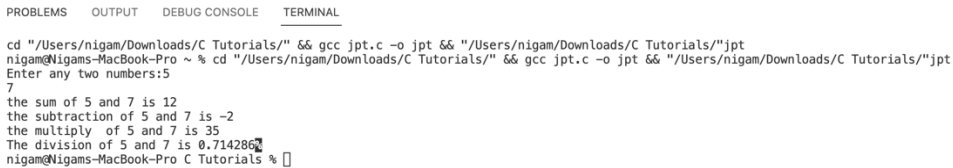
```
#include<stdio.h>
void add(int a,int b)
{
    int c;
    c = a+b;
    printf("the sum of %d and %d is %d",a,b,c);
}
void sub(int a,int b)
{
    int c;
    c = a-b;
    printf("\nthe subtraction of %d and %d is %d",a,b,c);
}
void mul(int a,int b)
{
    int c;
    c = a*b;
    printf("\nthe multiply of %d and %d is %d",a,b,c);
}
void div(int a,int b)
{
    float c;
    c = (float)a/b;
    printf("\nThe division of %d and %d is %f",a,b,c);
}
int main()
{
    int a,b;
    printf("Enter any two numbers:");
    scanf("%d%d",&a,&b);
    add(a,b);
    sub(a,b);
    mul(a,b);
    div(a,b);
}
```

```

return 0;
}

```

Output:



```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
cd "/Users/nigam/Downloads/C Tutorials/" && gcc jpt.c -o jpt && "/Users/nigam/Downloads/C Tutorials/"jpt
nigam@Nigams-MacBook-Pro ~ % cd "/Users/nigam/Downloads/C Tutorials/" && gcc jpt.c -o jpt && "/Users/nigam/Downloads/C Tutorials/"jpt
Enter any two numbers:5
7
the sum of 5 and 7 is 12
the subtraction of 5 and 7 is -2
the multiply of 5 and 7 is 35
The division of 5 and 7 is 0.714286
nigam@Nigams-MacBook-Pro C Tutorials %

```

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

Code:

```

#include<stdio.h>
#include<math.h>
int factorial(int n)
{
    if(n==0||n==1)
        return 1;
    else
        return (n*factorial(n-1));
}
int power(int x,int i)
{
    return pow(x,i);
}
int main()
{
    int n,x,fact,i;
    float sum=0.0;
    printf("Enter the value of n:");
    scanf("%d",&n);
    printf("Enter the value of x:");

```

```

scanf("%d",&x);
for(i=1;i<=n;i++)
{
    sum = sum + (float)power(x,i)/(factorial(i));
}
printf("the sum of series is %f",sum);
return 0;
}

```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code - C Tutorials + - [] ^ x

```

nigam@Nigams-MacBook-Pro ~ % cd "/Users/nigam/Downloads/C Tutorials/" && gcc lab2.c -o lab2 && "/Users/nigam/Downloads/C Tutorials/"lab2
Enter the value of n:2
Enter the value of x:3
the sum of series is 7.500000
nigam@Nigams-MacBook-Pro C Tutorials % 

```

3.WAP to calculate factorial using Recursion.

Code:

```

#include<stdio.h>
int factorial(int n)
{
    int fact;
    if(n==0||n==1)
        return 1;
    else
        return (n*factorial(n-1));
}
int main()
{
    int n,fact;
    printf("Enter the value of n:");
    scanf("%d",&n);
    fact=factorial(n);
    printf("%d! = %d",n,fact);
    return 0;
}

```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code + - [] [] ^ X

```
cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Enter the value of n:5
5! = 120
nigam@Nigams-MacBook-Pro C Tutorials %
```

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

Code:

```
#include<stdio.h>
int factorial(int n)
{
    int fact;
    if(n==0)
        return 0;
    else if(n==1)
        return 1;
    else
        return (factorial(n-1)+factorial(n-2));
}
int main()
{
    int n,i=0,c;
    printf("Enter the number of terms in series:");
    scanf("%d",&n);
    printf("fibonacci series\n");
    for(c=1;c<=n;c++)
    {
        printf("%d\n",factorial(i));
        i++;
    }
    return 0;
}
```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code + - [] [] ^ x

```
cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Enter the number of terms in series:5
fibonacci series
0
1
1
2
3
nigam@Nigams-MacBook-Pro C Tutorials %
```

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,b;
    printf("Enter any two number:");
    scanf("%d%d",&a,&b);
    printf("The numbers before swapping are: a = %d and b = %d\n",a,b);
    swap(&a,&b);
    printf("The numbers after swapping are: a = %d and b=%d",a,b);

    return 0;
}
```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code + - [] [] ^ x

```
cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Enter any two number:10 20
The numbers before swapping are: a = 10 and b = 20
The numbers after swapping are: a = 20 and b=10
nigam@Nigams-MacBook-Pro C Tutorials %
```

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 the concept of pass by reference.].

Code:

```
#include <stdio.h>
void calculator(float *a,float *b,float *Ans)
{

    char operator;

    printf("Enter '+' for addition '-' for subtraction '*' for multiplication: ");
    scanf(" %c",&operator);
    switch (operator)
    {
        case '+':*Ans=*a + *b;
            break;

        case '-':*Ans= *a- *b;
            break;

        case '*':*Ans= *a * *b;
            break;

        default:
            printf("Enter a valid operator.");
            break;
    }
}
int main()
{
    float a,b,Ans;
    char c;

    int d;
```

```

printf("Enter any two numbers:");
scanf("%f%f",&a,&b);
do
{
    calculator(&a,&b,&Ans);
    printf("%f",Ans);
    printf("\n enter y for more calculation\n");
    scanf("\n%c",&c);

} while (c=='y');

return 0;
}

```

Output:

```

nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Enter any two numbers:5 4
Enter '+' for addition '-' for subtraction '*' for multiplication: +
9.000000
enter y for more calculation
y
Enter '+' for addition '-' for subtraction '*' for multiplication: -
1.000000
enter y for more calculation
y
Enter '+' for addition '-' for subtraction '*' for multiplication: *
20.000000
enter y for more calculation

```

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

Code:

```

#include<stdio.h>
int isPrime(int n)
{
    int flag=0,i;
    if(n==0||n==1)
    return 0;

```

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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Code +

```
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Enter a number:3
3 is a prime number
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Enter a number:9
9 is not a prime number
nigam@Nigams-MacBook-Pro C Tutorials %
```


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

Code:

```
// for static variable
#include<stdio.h>
void counter()
{
    static int count;
    count ++;
    printf("Function called %d times\n",count);
}
int main()
{
    counter ();
    counter();
    counter();
    counter();
    return 0;
}
```

Output:



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
Function called 1 times
Function called 2 times
Function called 3 times
Function called 4 times
nigam@Nigams-MacBook-Pro C Tutorials % █
```

For global variable...

Code:

```
#include<stdio.h>
int a,b=10; // Global variable
void function_1()
{
    printf("From function_1 a=%d\t b=%d\n",a,b);
}
void function_2()
{
    a=20;
```

```

    b=30;
    printf("From function_2 a=%d\t b=%d\n",a,b);
}
void function_3()
{
    printf("From function_3 a=%d\t b=%d\n",a,b);
}
int main()
{
    printf("From main a=%d\t b=%d\n",a,b);
    function_1();
    function_2();
    function_3();
    a=25;
    function_3();
    function_1();
    return 0;
}

```

Output:

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OUTPUT

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cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
nigam@Nigams-MacBook-Pro C Tutorials % cd "/Users/nigam/Downloads/C Tutorials/" && gcc h.c -o h && "/Users/nigam/Downloads/C Tutorials/"h
From main a=0      b=10
From function_1 a=0      b=10
From function_2 a=20      b=30
From function_3 a=20      b=30
From function_3 a=25      b=30
From function_1 a=25      b=30
nigam@Nigams-MacBook-Pro C Tutorials %

```