

PROGRAMMING TASK

Problem Statement:

1. Numerical Calculator

1.1 Add

1.2 Sub

1.3 Divide

1.4 Multiply

2. Scientific Calculator

2.1 Logarithmic functions

2.2 Trigonometric Functions

2.3 Statistical computing

Description of task:

This program has both numerical calculator and scientific calculator. This calculator has a special feature of adding infinite number of terms. In addition section the program get input continuously from the user until the user enter the character 'q'. In subtraction section the get input continuously from the user until the user enter the number -1 to exit.. Same follows for multiplication also. But this feature will be complicated for user in division part alone, which leads to wrong output. So, in division

PAGE 1 OF 23

part, two number are inputted from the user to find quotient. In the scientific calculator section we can find $\log(n)$, $\log_{10}(n)$ by asking the user to input n value. Same as logarithmic function, the trigonometric function get the input from the user n and we can find all the trigonometric functions like $\cos(n)$, $\sin(n)$, $\tan(n)$, etc. Last but not least we have statistical computing to find mean, variance and standard deviation. This feature helps to find the output instantaneously which is code efficient.

PROGRAM:

```
#include<stdio.h>
#include<math.h>
#include<stdlib.h>

int main()
{
    char ch;
do {

    int choice;

printf("*****SIMPLE
CALCULATOR*****");
    printf("\n1.ADDITION");
    printf("\n2.SUBTRACTION");
    printf("\n3.MULTIPLICATION");
    printf("\n4.DIVISION");
    printf("\n5.LOGARITHMIC FUNCTIONS");
    printf("\n6.TROGONOMETRIC FUNCTIONS");
    printf("\n7.STATISTICAL COMPUTING");
    printf("\nENTER YOUR CHOICE:");
    scanf("%d",&choice);

    if(choice == 1)
    {
        int a=1000;
        char c;
        int sum=0,i;

        for(i=0;i<1000;i++)
        {
            printf("\nENTER THE NUMBERS:");
            scanf("%s",&c);
            if(c!= 'q')
            {
```

```

        sum += (int)c - '0';
        printf("\t\t\t\tSUM:%d",sum);
        printf("\nENTER q to exit");

    }
    else
    {
        printf("\n q is entered EXITTING!!!!");
        break;
    }
}
printf("\nFINAL SUM OF THE ELEMENTS ARE:%d",sum);
}

```

```

else if(choice ==2)
{
    int a=1000;
    char c;
    int dif=0,i;

    for(i=0;i<1000;i++)
    {
        printf("\nENTER THE NUMBERS:");
        scanf("%d",&c);
        if(c!= -1)
        {

            dif= dif - (int)c ;
            printf("\t\t\t\tDIF:%d",dif);
            printf("\nENTER -1 to exit");

        }
        else
        {
            printf("\n -1 is entered EXITTING!!!!");
            break;
        }
    }
}

```

```

        printf("\nFINAL    DIFFERENCE    OF    THE    ELEMENTS
ARE:%d",dif);
    }

```

```

else if(choice == 3)
{
    int a=1000;
    int c;
    int mul=1,i;

    for(i=0;i<1000;i++)
    {
        printf("\nENTER THE NUMBERS:");
        scanf("%d",&c);
        if(c!=-1)
        {

            mul = mul * (int)c;
            printf("\t\t\t\t\tMUL:%d",mul);
            printf("\nENTER -1 to exit");

        }
        else
        {
            printf("\n-1 is entered EXITTING!!!!");
            break;
        }
    }
    printf("\nFINAL SUM OF THE ELEMENTS ARE:%d",mul);
}

```

```

else if(choice ==4)
{
    float div1,div2,div;
    printf("\nENTER THE FIRST NUMBER");
    scanf("%f",&div1);

```

```

        printf("\nENTER THE SECOND NUMBER");
        scanf("%f",&div2);
        div= div1/div2;
        printf("\nDIFFERENCE OF TWO NUMBERS IS:%.2f",div);
    }

```

```

else if(choice == 5)
{

```

```

    double n,result;
    printf("Enter a number to calculate (base = e)\n");
    scanf("%lf", &n);
    result = log(n);
    printf("Natural log of %.2lf = %lf\n", n, log(n));
    printf("Natural log10 of %.2lf = %lf\n", n, log10(n));
}

```

```

else if(choice == 6)
{

```

```

    int choice2;
    printf("\n\t\t\t\t\tTRIGONOMETRIC FUNCTIONS");
    double n,result;
    printf("\nEnter a number to find all trigonometric functions\n");
    scanf("%lf", &n);
    printf("\ntan() of %.2lf = %lf\n", n,tan(n));
    printf("\nsin() of %.2lf = %.4lf\n", n,sin(n));
    printf("\ncos() of %.2lf = %.4lf\n", n,cos(n));
    printf("\ntanh() of %.2lf = %.4lf\n", n,tanh(n));
    printf("\nsinh() of %.2lf = %.4lf\n", n,sinh(n));
    printf("\ncosh() of %.2lf = %.4lf\n", n,cosh(n));
}

```

```

else if(choice == 7)
{

```

```

    float x[10];
    int i, n;
    float average, variance, std_deviation, sum = 0, sum1 = 0;

    printf("Enter the value of N \n");
    scanf("%d", &n);
    printf("Enter %d real numbers \n", n);
    for (i = 0; i < n; i++)
    {
        scanf("%f", &x[i]);
    }

    for (i = 0; i < n; i++)
    {
        sum = sum + x[i];
    }
    average = sum / (float)n;

    for (i = 0; i < n; i++)
    {
        sum1 += pow((x[i] - average), 2);
    }
    variance = sum1 / (float)n;
    std_deviation = sqrt(variance);
    printf("Average of all elements = %.2f\n", average);
    printf("variance of all elements = %.2f\n", variance);
    printf("Standard deviation = %.2f\n", std_deviation);
    }

    else
    {
        printf("INVALID INPUT");
    }

    printf ("\n\nDo you want to repeat the operation Y/N: ");
    scanf (" %c", &ch);

}
while (ch == 'y' || ch == 'Y');
return 0;

```

}

OUTPUT:

*****SIMPLE CALCULATOR*****

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:1

ENTER THE NUMBERS:2

SUM:2

ENTER q to exit

ENTER THE NUMBERS:3

SUM:5

ENTER q to exit

ENTER THE NUMBERS:2

SUM:7

ENTER q to exit

ENTER THE NUMBERS:1

SUM:8

ENTER q to exit

ENTER THE NUMBERS:4

SUM:12

ENTER q to exit

ENTER THE NUMBERS:2

SUM:14

ENTER q to exit

ENTER THE NUMBERS:4

SUM:18

ENTER q to exit

ENTER THE NUMBERS:9

SUM:27

ENTER q to exit

ENTER THE NUMBERS:8

SUM:35

ENTER q to exit

ENTER THE NUMBERS:7

SUM:42

ENTER q to exit

ENTER THE NUMBERS:5

SUM:47

ENTER q to exit

ENTER THE NUMBERS:q

q is entered EXITTING!!!!

FINAL SUM OF THE ELEMENTS ARE:47

Do you want to repeat the operation Y/N: y

*******SIMPLE CALCULATOR*******

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:2

ENTER THE NUMBERS:2

DIF:-2

ENTER -1 to exit

ENTER THE NUMBERS:5

DIF:-7

ENTER -1 to exit

ENTER THE NUMBERS:6

DIF:-13

ENTER -1 to exit

ENTER THE NUMBERS:-5

DIF:-8

ENTER -1 to exit

ENTER THE NUMBERS:-8

DIF:0

ENTER -1 to exit

ENTER THE NUMBERS:5

DIF:-5

ENTER -1 to exit

ENTER THE NUMBERS:-8

DIF:3

ENTER -1 to exit

ENTER THE NUMBERS:-9

DIF:12

ENTER -1 to exit

ENTER THE NUMBERS:-1

-1 is entered EXITTING!!!!

FINAL DIFFERENCE OF THE ELEMENTS ARE:12

Do you want to repeat the operation Y/N: y

*******SIMPLE CALCULATOR*******

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:3

ENTER THE NUMBERS:2

MUL:2

ENTER -1 to exit

ENTER THE NUMBERS:8

MUL:16

ENTER -1 to exit

ENTER THE NUMBERS:5

MUL:80

ENTER -1 to exit

ENTER THE NUMBERS:6

MUL:480

ENTER -1 to exit

ENTER THE NUMBERS:5

MUL:2400

ENTER -1 to exit

ENTER THE NUMBERS:2

MUL:4800

ENTER -1 to exit

ENTER THE NUMBERS:1

MUL:4800

ENTER -1 to exit

ENTER THE NUMBERS:2

MUL:9600

ENTER -1 to exit

ENTER THE NUMBERS:3

MUL:28800

ENTER -1 to exit

ENTER THE NUMBERS:-1

-1 is entered EXITTING!!!!

FINAL SUM OF THE ELEMENTS ARE:28800

Do you want to repeat the operation Y/N: y

*******SIMPLE CALCULATOR*******

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:4

ENTER THE FIRST NUMBER:15

ENTER THE SECOND NUMBER:3

DIFFERENCE OF TWO NUMBERS IS:5.00

Do you want to repeat the operation Y/N: y

*******SIMPLE CALCULATOR*******

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:4

ENTER THE FIRST NUMBER:16

ENTER THE SECOND NUMBER:8

DIFFERENCE OF TWO NUMBERS IS:2.00

Do you want to repeat the operation Y/N: y

*****SIMPLE CALCULATOR*****

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:5

Enter a number to calculate (base = e)

15

Natural log of 15.00 = 2.708050

Natural log10 of 15.00 = 1.176091

Do you want to repeat the operation Y/N: y

*****SIMPLE CALCULATOR*****

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:6

TRIGONOMETRIC FUNCTIONS

Enter a number to find all trigonometric functions

1.6

tan() of 1.60 = -34.232533

sin() of 1.60 = 0.9996

cos() of 1.60 = -0.0292

tanh() of 1.60 = 0.9217

sinh() of 1.60 = 2.3756

cosh() of 1.60 = 2.5775

Do you want to repeat the operation Y/N: y

*******SIMPLE CALCULATOR*******

1.ADDITION

2.SUBTRACTION

3.MULTIPLICATION

4.DIVISION

5.LOGARITHMIC FUNCTIONS

6.TROGONOMETRIC FUNCTIONS

7.STATISTICAL COMPUTING

ENTER YOUR CHOICE:7

Enter the value of N

5

Enter 5 real numbers

12

6

2

1

3

Average of all elements = 4.80

variance of all elements = 15.76

Standard deviation = 3.97

Do you want to repeat the operation Y/N: n

