Project Report

Project Name: Calculator Application

Course: Structured Programming Lab, **Code:** CSE 104

Submitted by

Hardcore Coders

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Introduction

A calculator is a type of electronic device, usually but not always handheld, designed to calculate problems in science, engineering, and mathematics. They have completely replaced slide rules in traditional applications, and are widely used in both education and professional settings. In certain contexts such as higher education, calculators have been superseded by graphing calculators.

The HP-35, introduced on February 1, 1972, was Hewlett-Packard's first pocket calculator and the world's first handheld scientific calculator. Like some of HP's desktop calculators it used RPN. Introduced at US $395, the HP-35 was available from 1972 to 1975.

Texas Instruments (TI), after the introduction of several units with scientific notation, came out with a handheld scientific calculator on January 15, 1974, in the form of the SR-50. TI continues to be a major player in the calculator market, with their long-running TI-30 series being one of the most widely used calculators in classrooms.
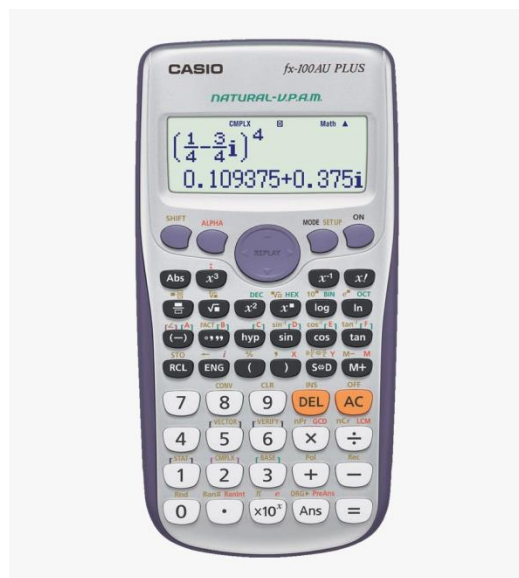
Utilization

A sample C programming code for a real time calculator application program is given below. This program will perform the below calculator operations.

1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Modulus
6. Power
7. Factorial

Uses:

Calculators are used widely in situations that require quick access to certain mathematical functions, especially those that were once looked up in mathematical tables, such as trigonometric functions or logarithms. They are also used for calculations of very large or very small numbers, as in some aspects of astronomy, physics, and chemistry.

They are very often required for math classes from the junior high school level through college, and are generally either permitted or required on many standardized tests covering math and science subjects; as a result, many are sold into educational markets to cover this demand, and some high-end models include features making it easier to translate a problem on a textbook page into calculator input, e.g. by providing a method to enter an entire problem in as it is written on the page using simple formatting tools.

<u>Description</u>

Addition

The addition (sum function) is used by clicking on the "+" button or using the keyboard. The function results in a+b.

Subtraction

The subtraction (minus function) is used by clicking on the "-" button or using the keyboard. The function results in a-b.

Multiplication

The multiplication (times function) is used by clicking on the "x" button or using the keyboard "*" key. The function results in a*b.

Division

The division (divide function) is used by clicking on the "/" button or using the keyboard "/" key. The function results in a/b.

Modulus

The modulus (modulus function) is used by clicking on the "?" button or using the keyboard "?" key.

Power

The raise to the power (y raised to the x function) is used by clicking on the "y^x" button or type "^".

Factorial

The Factorial function is used by clicking the "!" button or type "!".

Source code

```c
#include<stdio.h>
#include<conio.h>
#include<math.h>
#include<stdlib.h>
#define KEY "Enter the calculator Operation you want to do:"

void addition();
void subtraction();
void multiplication();
void division();
void modulus();
void power();
int factorial();
void calculator_operations();

int main()
{
    int X=1;
    char Calc_oprn;

    calculator_operations();

    while(X)
    {
        printf("\n");
        printf("%s : ", KEY);

        Calc_oprn=getche();

        switch(Calc_oprn)
        {
        case '+':
            addition();
            break;

        case '-':
            subtraction();
            break;
```

```c
        case '*':
            multiplication();
            break;

        case '/':
            division();
            break;

        case '?':
            modulus();
            break;

        case '!':
            factorial();
            break;

        case '^':
            power();
            break;

        case 'H':
        case 'h':
            calculator_operations();
            break;

        case 'Q':
        case 'q':
            exit(0);
            break;
        case 'c':
        case 'C':
            system("cls");
            calculator_operations();
            break;

        default :
            system("cls");

            printf("\n**********You have entered unavailable option");
            printf("***********\n");
            printf("\n*****Please Enter any one of below available ");
            printf("options****\n");
            calculator_operations();
        }
```

```c
    }
}

void calculator_operations()
{
    printf("\n            Welcome to C calculator \n\n");
    printf("******* Press 'Q' or 'q' to quit ");
    printf("the program ********\n");
    printf("***** Press 'H' or 'h' to display ");
    printf("below options *****\n\n");
    printf("Enter 'C' or 'c' to clear the screen and");
    printf(" display available option \n\n");
    printf("Enter + symbol for Addition \n");
    printf("Enter - symbol for Subtraction \n");
    printf("Enter * symbol for Multiplication \n");
    printf("Enter / symbol for Division \n");
    printf("Enter ? symbol for Modulus\n");
    printf("Enter ^ symbol for Power \n");
    printf("Enter ! symbol for Factorial \n\n");
}

void addition()
{
    int n, total=0, k=0, number;
    printf("\nEnter the number of elements you want to add:");
    scanf("%d",&n);
    printf("Please enter %d numbers one by one: \n",n);
    while(k<n)
    {
        scanf("%d",&number);
        total=total+number;
        k=k+1;
    }
    printf("Sum of %d numbers = %d \n",n,total);
}

void subtraction()
{
    int a, b, c = 0;
    printf("\nPlease enter first number  : ");
    scanf("%d", &a);
    printf("Please enter second number : ");
    scanf("%d", &b);
    c = a - b;
```

```c
    printf("\n%d - %d = %d\n", a, b, c);
}

void multiplication()
{
    int a, b, mul=0;
    printf("\nPlease enter first numb   : ");
    scanf("%d", &a);
    printf("Please enter second number: ");
    scanf("%d", &b);
    mul=a*b;
    printf("\nMultiplication of entered numbers = %d\n",mul);
}

void division()
{
    int a, b, d=0;
    printf("\nPlease enter first number  : ");
    scanf("%d", &a);
    printf("Please enter second number : ");
    scanf("%d", &b);
    d=a/b;
    printf("\nDivision of entered numbers=%d\n",d);
}

void modulus()
{
    int a, b, d=0;
    printf("\nPlease enter first number   : ");
    scanf("%d", &a);
    printf("Please enter second number  : ");
    scanf("%d", &b);
    d=a%b;
    printf("\nModulus of entered numbers = %d\n",d);
}

void power()
{
    double a,num, p;
    printf("\nEnter two numbers to find the power \n");
    printf("number: ");
    scanf("%lf",&a);

    printf("power : ");
```

```c
    scanf("%lf",&num);

    p=pow(a,num);

    printf("\n%lf to the power %lf = %lf \n",a,num,p);
}

int factorial()
{
    int i,fact=1,num;

    printf("\nEnter a number to find factorial : ");
    scanf("%d",&num);

    if (num<0)
    {
        printf("\nPlease enter a positive number to");
        printf(" find factorial and try again. \n");
        printf("\nFactorial can't be found for negative");
        printf(" values. It can be only positive or 0  \n");
        return 1;
    }

    for(i=1; i<=num; i++)
        fact=fact*i;
    printf("\n");
    printf("Factorial of entered number %d is:%d\n",num,fact);
    return 0;
}
```

Output

```
                 Welcome to C calculator

******* Press 'Q' or 'q' to quit the program ********
***** Press 'H' or 'h' to display below options *****

Enter 'C' or 'c' to clear the screen and display available option

Enter + symbol for Addition
Enter - symbol for Subtraction
Enter * symbol for Multiplication
Enter / symbol for Division
Enter ? symbol for Modulus
Enter ^ symbol for Power
Enter ! symbol for Factorial


Enter the calculator Operation you want to do: : +
Enter the number of elements you want to add : 3
Please enter 3 numbers one by one:
10
20
30
Sum of 3 numbers = 60

Enter the calculator Operation you want to do: : -
Please enter first number  : 40
Please enter second number : 25

40 - 25 = 15

Enter the calculator Operation you want to do: : *
Please enter first numb    : 3
Please enter second number: 6

Multiplication of entered numbers = 18

Enter the calculator Operation you want to do: : /
Please enter first number  : 30
Please enter second number : 11

Division of entered numbers=2
```

```
Enter the calculator Operation you want to do: : ?
Please enter first number    : 30
Please enter second number   : 11

Modulus of entered numbers = 8

Enter the calculator Operation you want to do: : ^
Enter two numbers to find the power
number: 3
power : 4

3.000000 to the power 4.000000 = 81.000000

Enter the calculator Operation you want to do: : !
Enter a number to find factorial : 4

Factorial of entered number 4 is : 24
```

Disscussion

In most countries, students use calculators for schoolwork. There was some initial resistance to the idea out of fear that basic arithmetic skills would suffer. There remains disagreement about the importance of the ability to perform calculations "in the head", with some curricula restricting calculator use until a certain level of proficiency has been obtained, while others concentrate more on teaching estimation techniques and problem-solving. Research suggests that inadequate guidance in the use of calculating tools can restrict the kind of mathematical thinking that students engage in.

Others have argued that calculator use can even cause core mathematical skills to atrophy, or that such use can prevent understanding of advanced algebraic concepts.

There are other concerns - for example, that a pupil could use the calculator in the wrong fashion but believe the answer because that was the result given. Teachers try to combat this by encouraging the student to make an estimate of the result manually and ensuring it roughly agrees with the calculated result. Also, it is possible for a child to type in -1×-1 and obtain the correct answer '1' without realizing the principle involved. In this sense, the calculator becomes a crutch rather than a learning tool, and it can slow down students in exam conditions as they check even the most trivial result on a calculator.

Our project will be able to implement in future after making some changes and modifications as we make our project at a very low level. So the modifications that can be done in our project are:

To make it screen touch so no need to touch key buttons and one more change which can we made is to add snaps of the person who use it.

Testing is the major control measure used during software development. Its basic function is to detect errors in the software. During requirement analysis and design, the output is a document that is usually textual and no executable. After the coding phase, computer programs are available that can be executed for testing purpose. This implies that testing not only, has to uncover errors introduced during coding, but also errors introduced during previous phase. Thus the goal of testing is to uncover the requirements, design and coding errors in the programs. The Source code declared above for the program of Calculator has been tested and it has been found that the above source code is okay and correct. The program is involving many types of conversion.

THE END