

Calculator

Project Objective:

This is a simple calculator that can perform various operations on numbers. This program is developed in C++.

Statistics:

Starting Date: 16/11/2022

End Date: 20/11/2022

Total Days: 5 Days

Total Line of Code : 192

Functions used:

1. **add(int num1,int num2):** This function adds two numbers which we need to pass as arguments.
2. **sub(int num1,int num):** This function subtracts two numbers which we need to pass as arguments.
3. **mult(int num1,int num2):** This function multiplies two numbers which we need to pass as arguments.
4. **div(int num1,int num2):** This function divides two numbers which we need to pass as arguments.
5. **Expcalc(int num1,int num2):** This function calculates the power of a number when passed as arguments.
6. **factorial(int num1):** This function calculates the factorial of the first number which is passed as argument.
7. **permutation(int num1,int num2):** This function calculates the permutation of two number which we need to pass as arguments.
8. **combination(int num1,int num2):** This function calculates the permutation of two number which we need to pass as arguments.
9. **squareroot(int num1):** This function calculates the square root of the first w=number which is passed as argument.
10. **main():** Main function which executes the whole program with the help of switch case.

Program Code:

```
#include<iostream>
#include<conio.h>
#include<math.h>
using namespace std;

/**
 * Function declarations for calculator
 */
float add(float num1, float num2);
float sub(float num1, float num2);
float mult(float num1, float num2);
float div(float num1, float num2);
int Expcalc(int num1, int num2);
int factorial(int num1);
int permutation(int num1, int num2);
float squareroot(int num1);
int combination(int num1, int num2);

int main()
{
    for(int j=0;j<50;j++)
    {
        int op;
        float num1, num2, result=0.0f;
        /* Print welcome message */
        cout<<("\nWELCOME TO SIMPLE CALCULATOR\n");
        cout<<("_____\n");
        cout<<("Enter [number 1] [number 2]\n");
        cin>>num1>>num2;
        cout<<"What operation do you want to perform ?"<<endl;
        cout<<"1. Addition"<<endl;
        cout<<"2. Subtraction"<<endl;
        cout<<"3. Multiplication"<<endl;
        cout<<"4. Division"<<endl;
        cout<<"5. Factorial"<<endl;
        cout<<"6. Permutation"<<endl;
        cout<<"7. Combination"<<endl;
        cout<<"8. Exponential power calulation"<<endl;
        cout<<"9. Square roots"<<endl;
        cout<<"10. Exit"<<endl;
        cout<<"Enter your choice: ";
        cin>>op;
        if(op==10)
        {
            break;
        }
    }
}
```

```

switch(op)
{
    case 1:
        result = add(num1, num2);
        break;

    case 2:
        result = sub(num1, num2);
        break;

    case 3:
        result = mult(num1, num2);
        break;

    case 4:
        result = div(num1, num2);
        break;
    case 5:
        result = factorial(num1);
        break;
    case 6:
        result = permutation(num1,num2);
        break;
    case 7:
        result = combination(num1, num2);
        break;
    case 8:
        result = Expcalc(num1, num2);
        break;
    case 9:
        result = squareroot(num1);
        break;
    case 10:
        break;
    default:
        cout<<"Invalid operatoion"<<endl;
}

cout<<"Result: "<<result;
getch();
}
return 0;
}

/**
 * Function to add two numbers
 */
float add(float num1, float num2)
{
    return num1 + num2;
}

```

```

/**
 * Function to subtract two numbers
 */
float sub(float num1, float num2)
{
    return num1 - num2;
}

/**
 * Function to multiply two numbers
 */
float mult(float num1, float num2)
{
    return num1 * num2;
}

/**
 * Function to divide two numbers
 */
float div(float num1, float num2)
{
    return num1 / num2;
}

/**
 * Function to find factorial of a number
 */
int factorial(int num1)
{
    int factorial=1;
    for(int i=1;i<=num1;i++)
    {
        factorial=factorial*i;
    }
    return factorial;
}

/**
 * Function to find Permutation of two numbers
 */
int permutation(int num1, int num2)
{
    int n,r,n_factorial=1,nr_factorial=1;
    n=max(num1,num2);
    r=min(num1,num2);
    for(int i=1;i<=n;i++)
    {
        n_factorial=n_factorial*i;
    }
    for(int i=1;i<=(n-r);i++)
    {
        nr_factorial=nr_factorial*i;
    }
}

```

```

    }
    return n_factorial/nr_factorial;
}

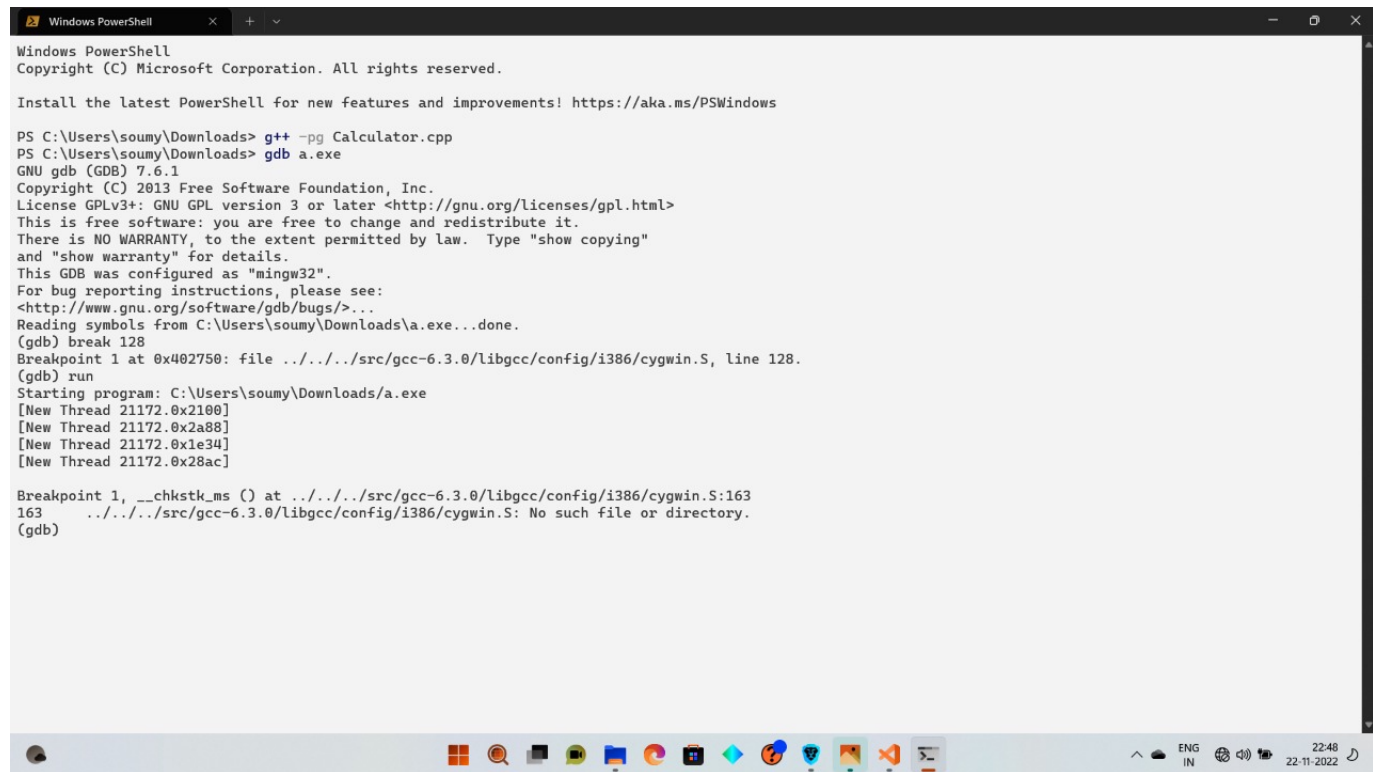
/**
 * Function to find Combination of two numbers
 */
int combination(int num1, int num2)
{
    int n,r,n_factorial=1,nr_factorial=1,r_factorial=1;
    n=max(num1,num2);
    r=min(num1,num2);
    for(int i=1;i<=n;i++)
    {
        n_factorial=n_factorial*i;
    }
    for(int i=1;i<=(n-r);i++)
    {
        nr_factorial=nr_factorial*i;
    }
    for(int i=1;i<=r;i++)
    {
        r_factorial=r_factorial*i;
    }
    return n_factorial/(nr_factorial*r_factorial);
}

/**
 * Function to calculate power of a number
 */
int Expcalc(int num1, int num2)
{
    return pow(num1,num2);
}

/**
 * Function to calculate square root of a number
 */
float squareroot(int num1)
{
    return sqrt(num1);
}

```

Debugging:

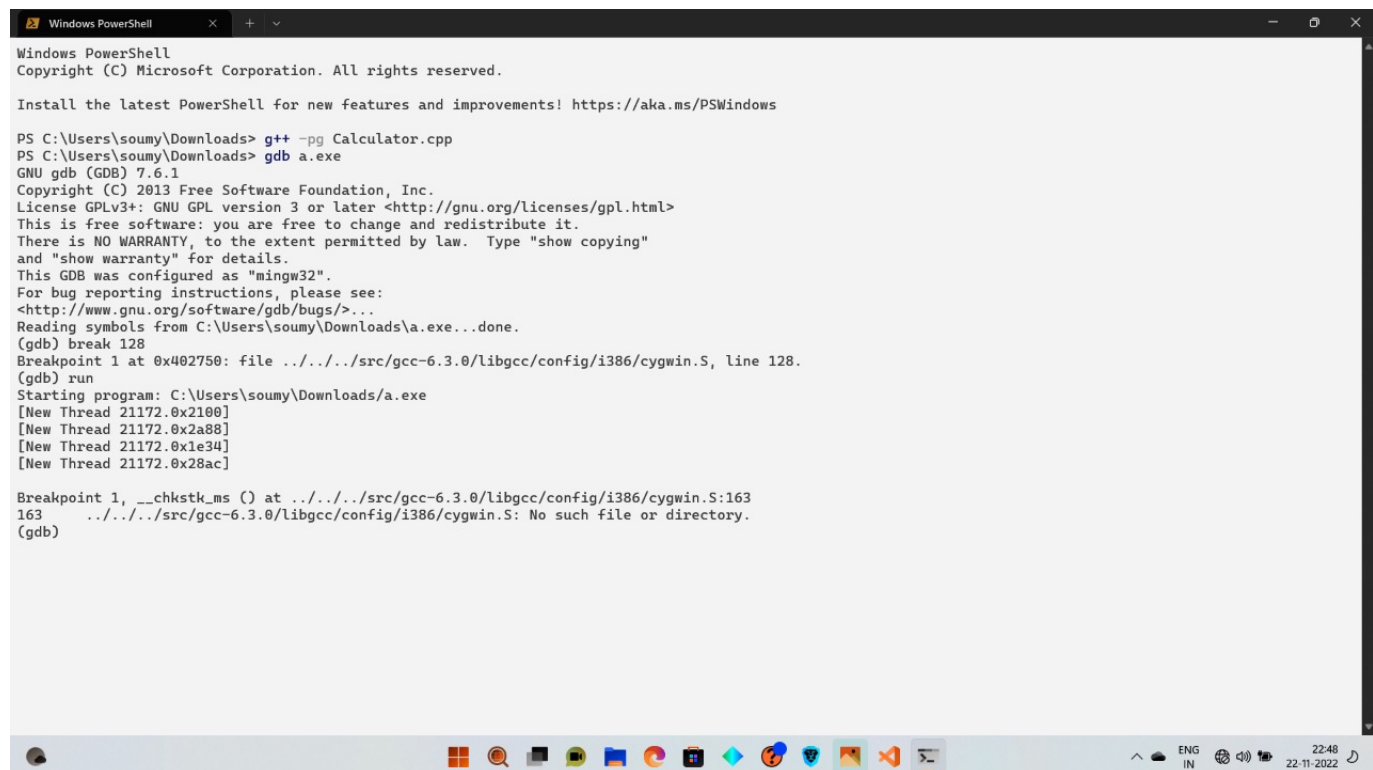


```
Windows PowerShell
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PS C:\Users\soumy\Downloads> g++ -pg Calculator.cpp
PS C:\Users\soumy\Downloads> gdb a.exe
GNU gdb (GDB) 7.6.1
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License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law. Type "show copying"
and "show warranty" for details.
This GDB was configured as "mingw32".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from C:\Users\soumy\Downloads\a.exe...done.
(gdb) break 128
Breakpoint 1 at 0x402750: file ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S, line 128.
(gdb) run
Starting program: C:\Users\soumy\Downloads\a.exe
[New Thread 21172.0x2100]
[New Thread 21172.0x2a88]
[New Thread 21172.0x1e34]
[New Thread 21172.0x28ac]

Breakpoint 1, __chkstk_ms () at ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S:163
163      ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S: No such file or directory.
(gdb)
```



```
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PS C:\Users\soumy\Downloads> g++ -pg Calculator.cpp
PS C:\Users\soumy\Downloads> gdb a.exe
GNU gdb (GDB) 7.6.1
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License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
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and "show warranty" for details.
This GDB was configured as "mingw32".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from C:\Users\soumy\Downloads\a.exe...done.
(gdb) break 128
Breakpoint 1 at 0x402750: file ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S, line 128.
(gdb) run
Starting program: C:\Users\soumy\Downloads\a.exe
[New Thread 21172.0x2100]
[New Thread 21172.0x2a88]
[New Thread 21172.0x1e34]
[New Thread 21172.0x28ac]

Breakpoint 1, __chkstk_ms () at ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S:163
163      ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S: No such file or directory.
(gdb)
```

```
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PS C:\Users\soumy\Downloads> g++ -pg Calculator.cpp
PS C:\Users\soumy\Downloads> gdb a.exe
GNU gdb (GDB) 7.6.1
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License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law. Type "show copying"
and "show warranty" for details.
This GDB was configured as "mingw32".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from C:\Users\soumy\Downloads\a.exe...done.
(gdb) break 160
Breakpoint 1 at 0x402750: file ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S, line 160.
(gdb) run
Starting program: C:\Users\soumy\Downloads\a.exe
[New Thread 13604.0x3160]
[New Thread 13604.0x547c]
[New Thread 13604.0xda0]
[New Thread 13604.0x2690]
```

```
Windows PowerShell
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PS C:\Users\soumy\Downloads> g++ -pg Calculator.cpp
PS C:\Users\soumy\Downloads> gdb a.exe
GNU gdb (GDB) 7.6.1
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License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law. Type "show copying"
and "show warranty" for details.
This GDB was configured as "mingw32".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from C:\Users\soumy\Downloads\a.exe...done.
(gdb) break 183
Breakpoint 1 at 0x402779: file ../../src/gcc-6.3.0/libgcc/config/i386/cygwin.S, line 183.
(gdb) run
Starting program: C:\Users\soumy\Downloads\a.exe
[New Thread 23060.0x1968]
[New Thread 23060.0x86c]
[New Thread 23060.0x3b48]
[New Thread 23060.0x5938]
```

Profiling:

Flat profile:

Each sample counts as 0.01 seconds.
no time accumulated

% time	cumulative seconds	self seconds	calls	self Ts/call	total Ts/call	name
0.00	0.00	0.00	1	0.00	0.00	deregister_tm_clones
0.00	0.00	0.00	1	0.00	0.00	register_tm_clones

Call graph (explanation follows)

granularity: each sample hit covers 2 byte(s) no time propagated

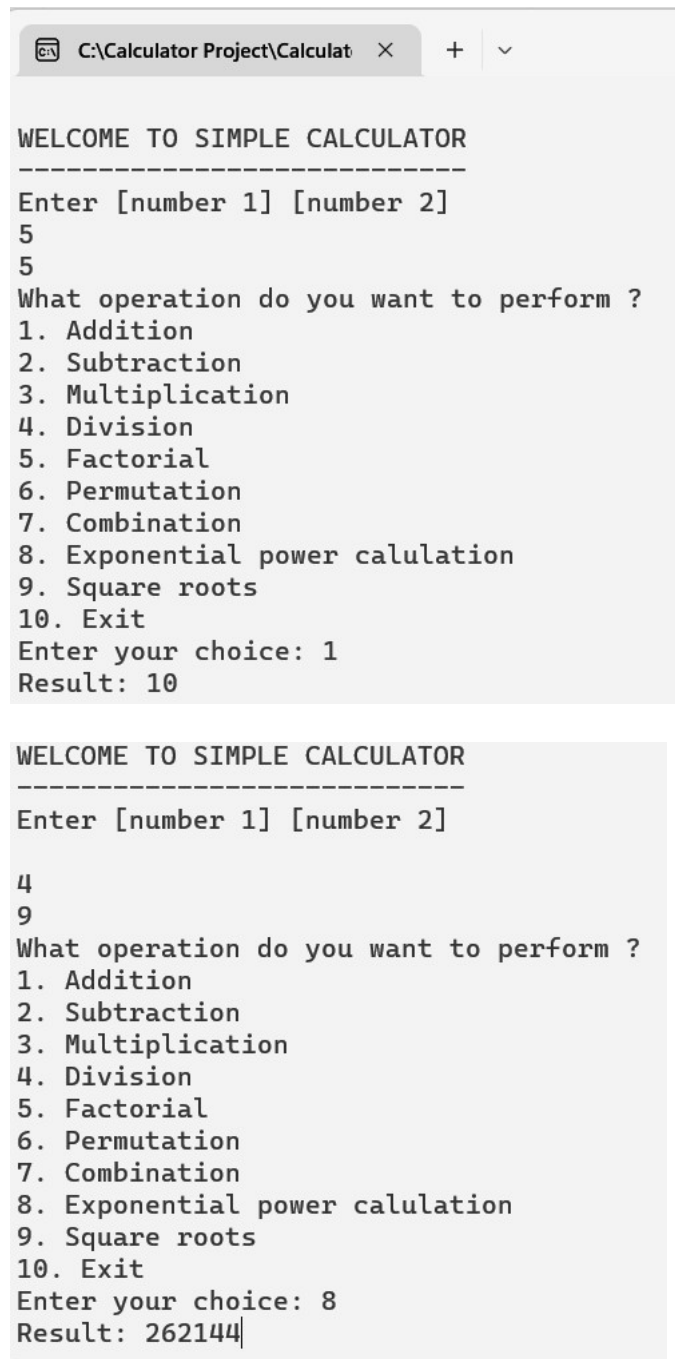
index	% time	self	children	called	name
		0.00	0.00	1/1	register_tm_clones [2]
[1]	0.0	0.00	0.00	1	deregister_tm_clones [1]

		0.00	0.00	1/1	frame_dummy [4]
[2]	0.0	0.00	0.00	1	register_tm_clones [2]
		0.00	0.00	1/1	deregister_tm_clones [1]

Index by function name

[1] deregister_tm_clones [2] register_tm_clones

Program Output:



```
WELCOME TO SIMPLE CALCULATOR
-----
Enter [number 1] [number 2]
5
5
What operation do you want to perform ?
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Factorial
6. Permutation
7. Combination
8. Exponential power calulation
9. Square roots
10. Exit
Enter your choice: 1
Result: 10

WELCOME TO SIMPLE CALCULATOR
-----
Enter [number 1] [number 2]
4
9
What operation do you want to perform ?
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Factorial
6. Permutation
7. Combination
8. Exponential power calulation
9. Square roots
10. Exit
Enter your choice: 8
Result: 262144
```

WELCOME TO SIMPLE CALCULATOR

Enter [number 1] [number 2]

7

9

What operation do you want to perform ?

1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Factorial
6. Permutation
7. Combination
8. Exponential power calculation
9. Square roots
10. Exit

Enter your choice: 5

Result: 5040|

WELCOME TO SIMPLE CALCULATOR

Enter [number 1] [number 2]

8

6

What operation do you want to perform ?

1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Factorial
6. Permutation
7. Combination
8. Exponential power calculation
9. Square roots
10. Exit

Enter your choice: 6

Result: 20160|