



# Calculator in Assembly Language

EMU8086\_CALCULATOR

## Project Members

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## Abstract:

This is our basic calculator made on emu-8086. This is a very efficient calculator and has the functionality of performing all the Arithmetic operations, we have made some additional features like performing square and cube of a specific number. Another extra feature we have is converting Temperature from Celcius to Farenheit and Farenheit to Celsius.

## Objectives:

1. Basic objective behind making a calculator was to make our life easier as this program will compute all the operations on itself, no need to overthink.
2. Whenever a user inputs the number it will perform the calculation according to their needs.
3. It saves a lot of time for users. Calculators are a big help when doing mathematical equations correctly.

## Problem Statement:

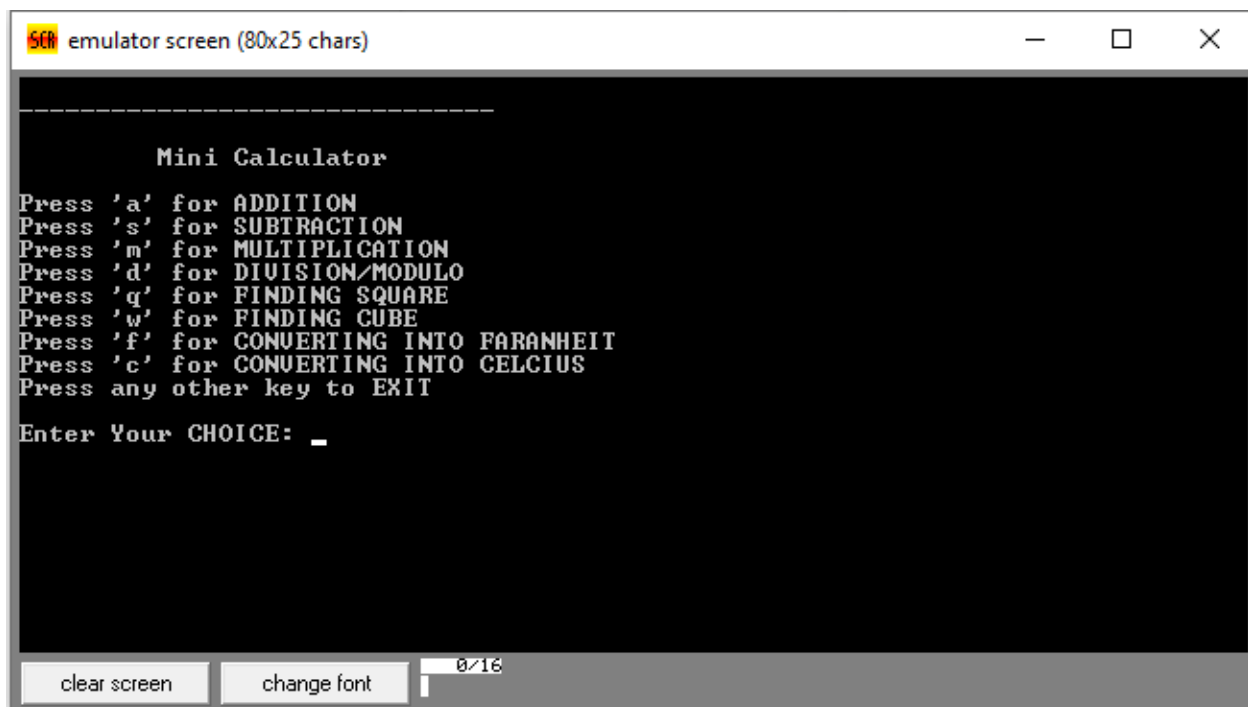
A long time ago calculations done manually were quite a difficult task. It was too time consuming and the probability of getting the correct answer was very low. As all the calculations were manual. It consumes a lot of time and sometimes we can get wrong answers. So we have solved the problem and made this calculator. Now it is very simple to handle and gives the answer 100% correct.

## Methodology:

Basically a menu will be displayed that will contain all the operations of addition, subtraction, multiplication, division, square, cube, celsius to fahrenheit and fahrenheit to celsius. All these will be displayed along with their key when a user enters the specific key it will perform the specific operation and return to the main menu.

## Project Deployment Snippets:-

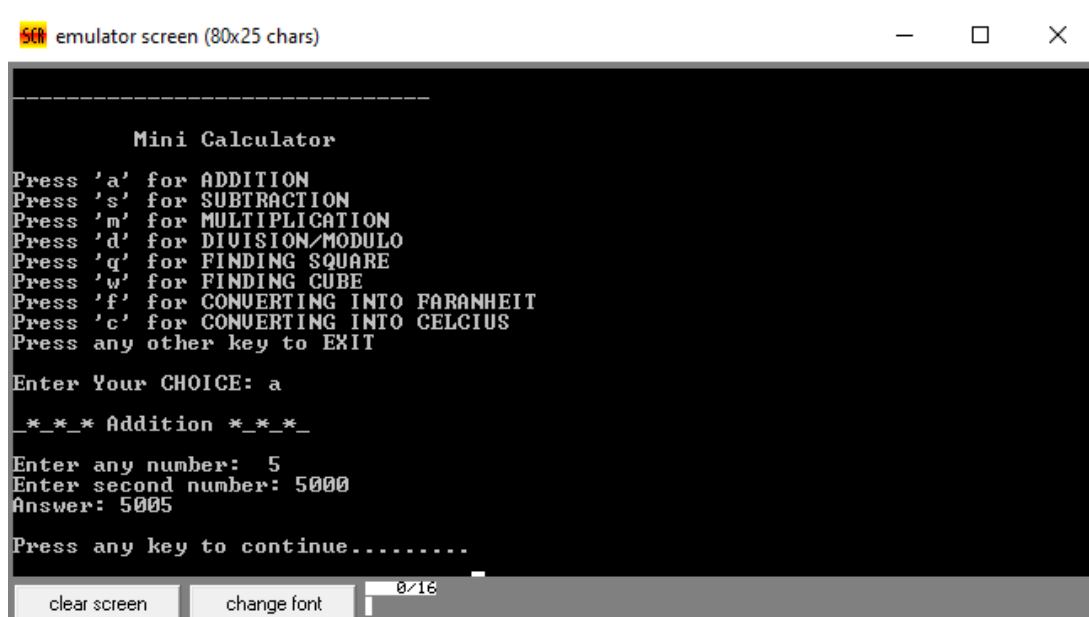
### Menu:-



The screenshot shows a window titled "sch emulator screen (80x25 chars)". Inside, a menu for "Mini Calculator" is displayed. The menu lists several options with their corresponding keyboard shortcuts: 'a' for ADDITION, 's' for SUBTRACTION, 'm' for MULTIPLICATION, 'd' for DIVISION/MODULO, 'q' for FINDING SQUARE, 'w' for FINDING CUBE, 'f' for CONVERTING INTO FARANHEIT, and 'c' for CONVERTING INTO CELCIUS. It also includes an option to "Press any other key to EXIT". Below the menu, it says "Enter Your CHOICE: \_". At the bottom of the window, there are two buttons: "clear screen" and "change font", and a small display showing "0/16".

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
Enter Your CHOICE: _  
  
clear screen  change font  0/16
```

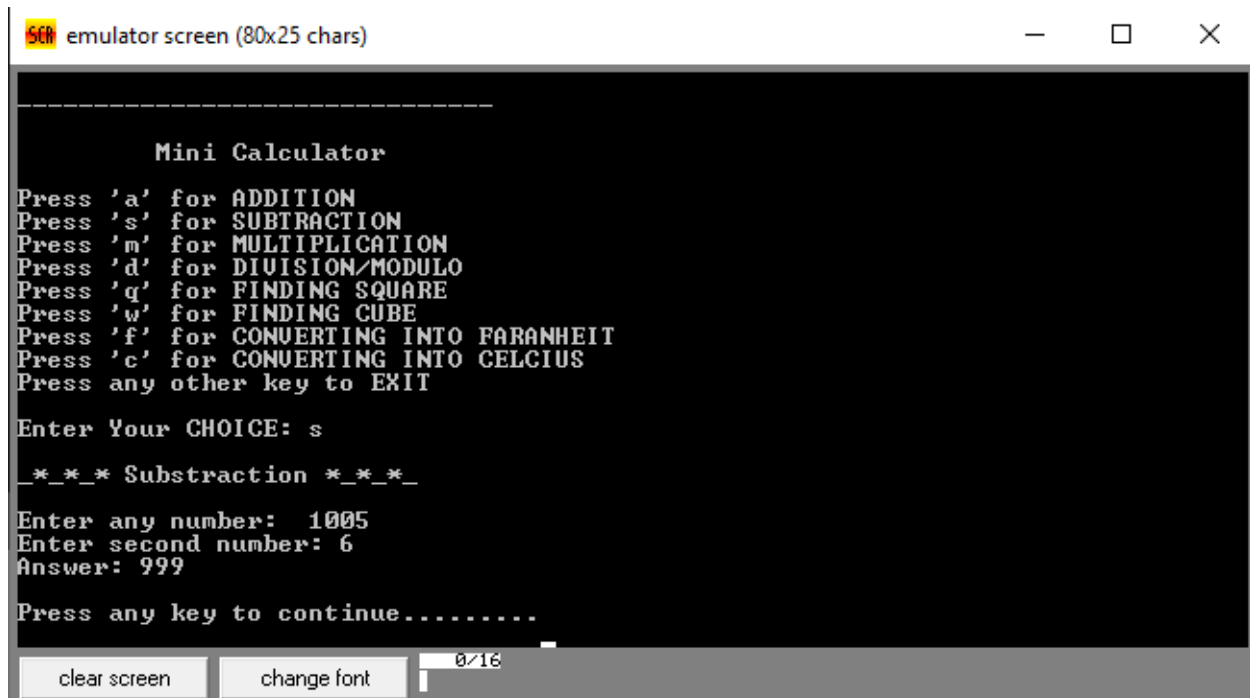
### Addition Function:-



The screenshot shows the same "Mini Calculator" menu as before. This time, the user has entered 'a' for the choice. The screen displays "Enter Your CHOICE: a". Below that, it says "Addition" with asterisks. Then, it prompts for two numbers: "Enter any number: 5" and "Enter second number: 5000". The result is shown as "Answer: 5005". At the bottom, it says "Press any key to continue.....". The bottom of the window has the same "clear screen", "change font", and "0/16" display as the previous screenshot.

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
Enter Your CHOICE: a  
*_** Addition ***_  
Enter any number: 5  
Enter second number: 5000  
Answer: 5005  
Press any key to continue.....  
  
clear screen  change font  0/16
```

## Subtraction Function:-



emulator screen (80x25 chars)

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: s  
_*_*_* Substraction *_*_*_  
  
Enter any number: 1005  
Enter second number: 6  
Answer: 999  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

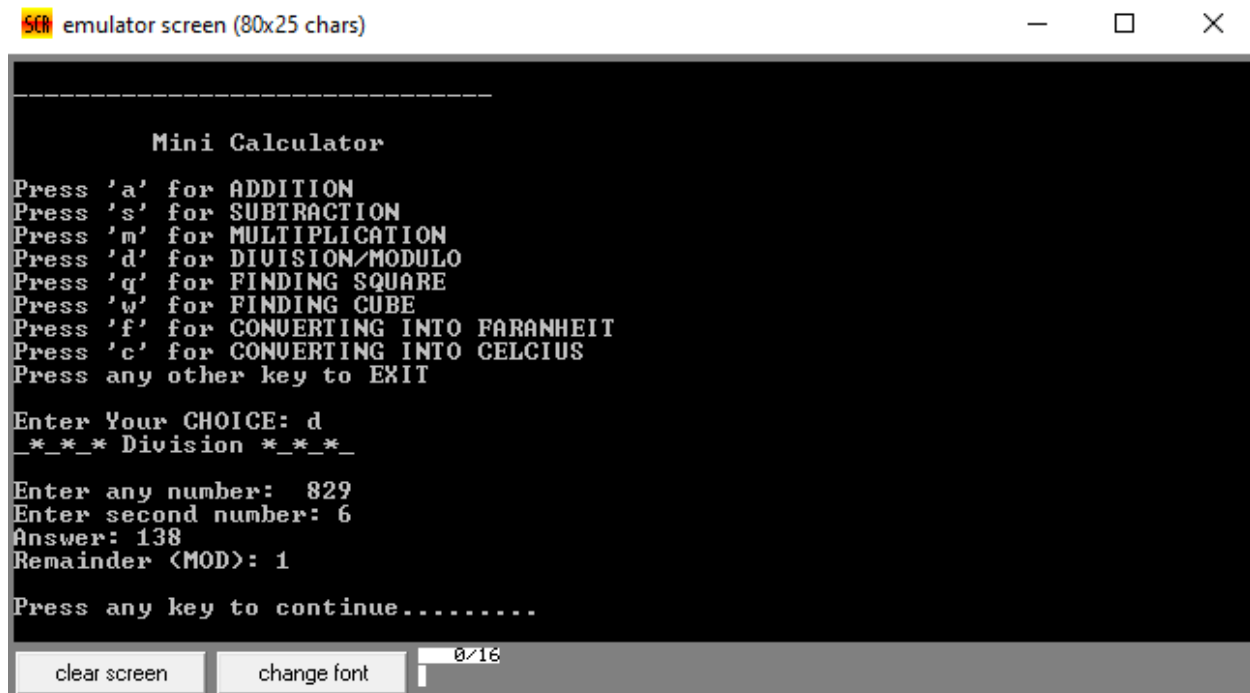
## Multiplication Function:-



emulator screen (80x25 chars)

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: m  
_*_*_* Multiplication *_*_*_  
  
Enter any number: 1400  
Enter second number: 20  
Answer: 28000  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

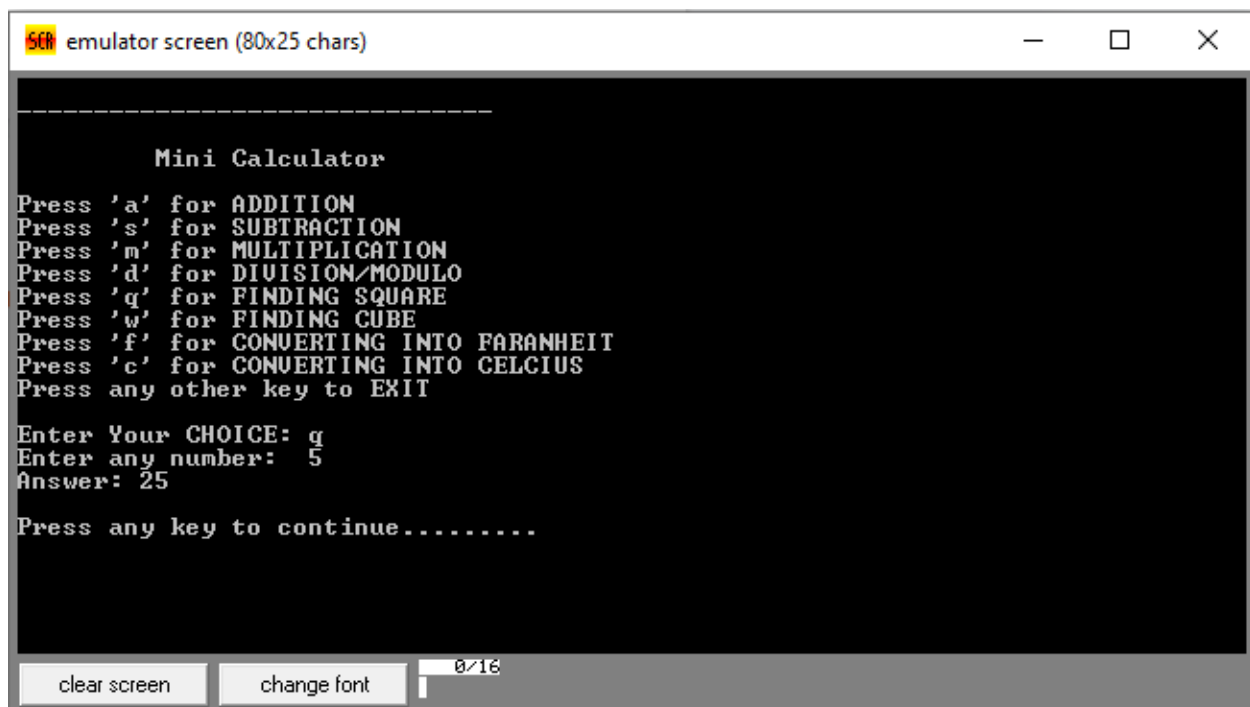
## Division/ Modulo Function:-



emulator screen (80x25 chars)

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: d  
_*_*_* Division *_*_*_  
  
Enter any number: 829  
Enter second number: 6  
Answer: 138  
Remainder <MOD>: 1  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

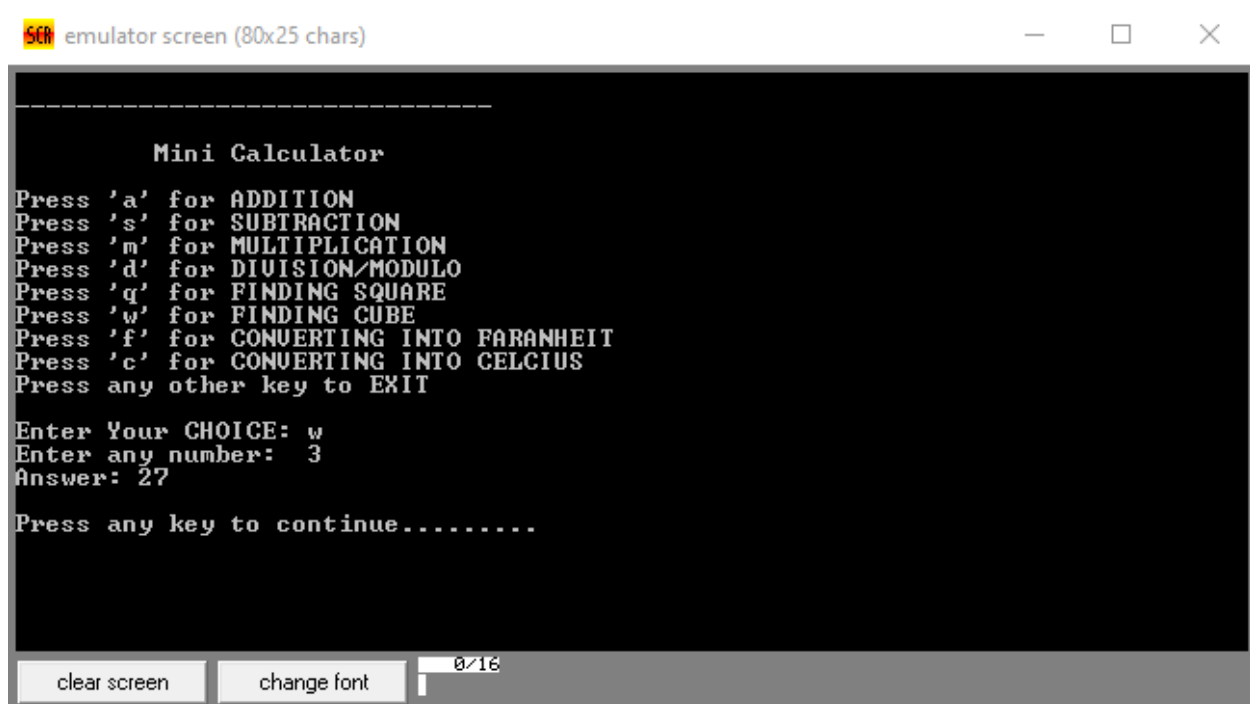
## Square Function:-



emulator screen (80x25 chars)

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: q  
Enter any number: 5  
Answer: 25  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

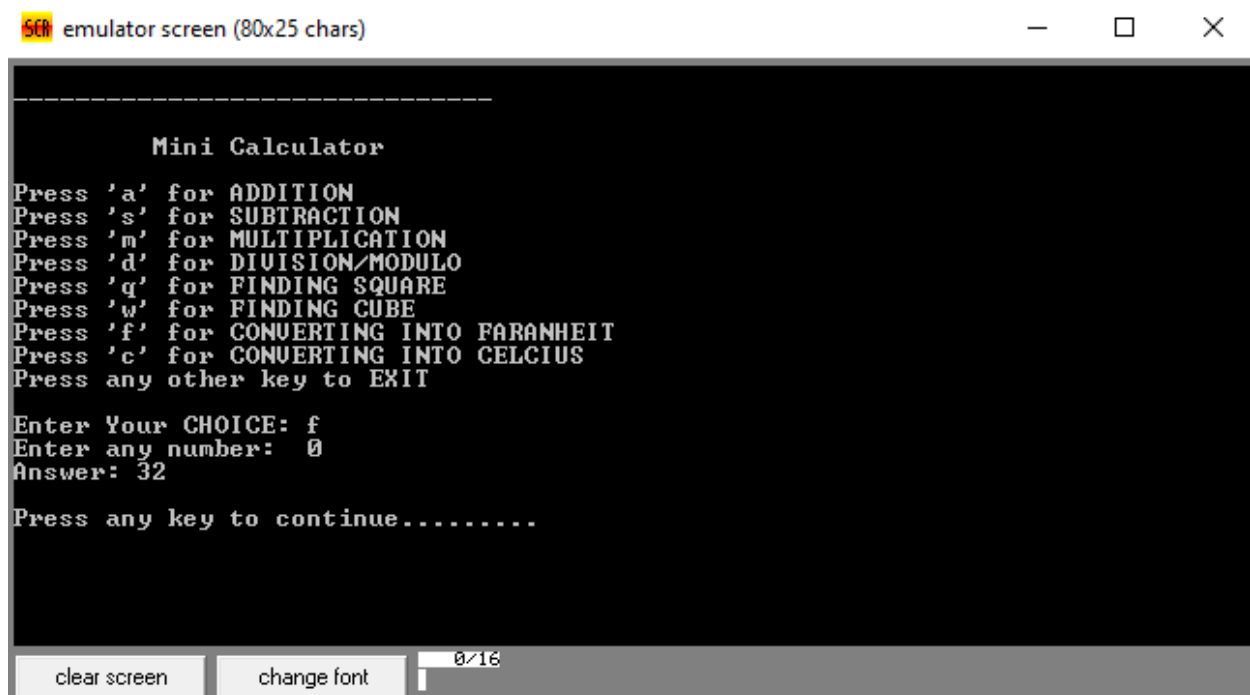
## Cube Function:-



emulator screen (80x25 chars)

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: w  
Enter any number: 3  
Answer: 27  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

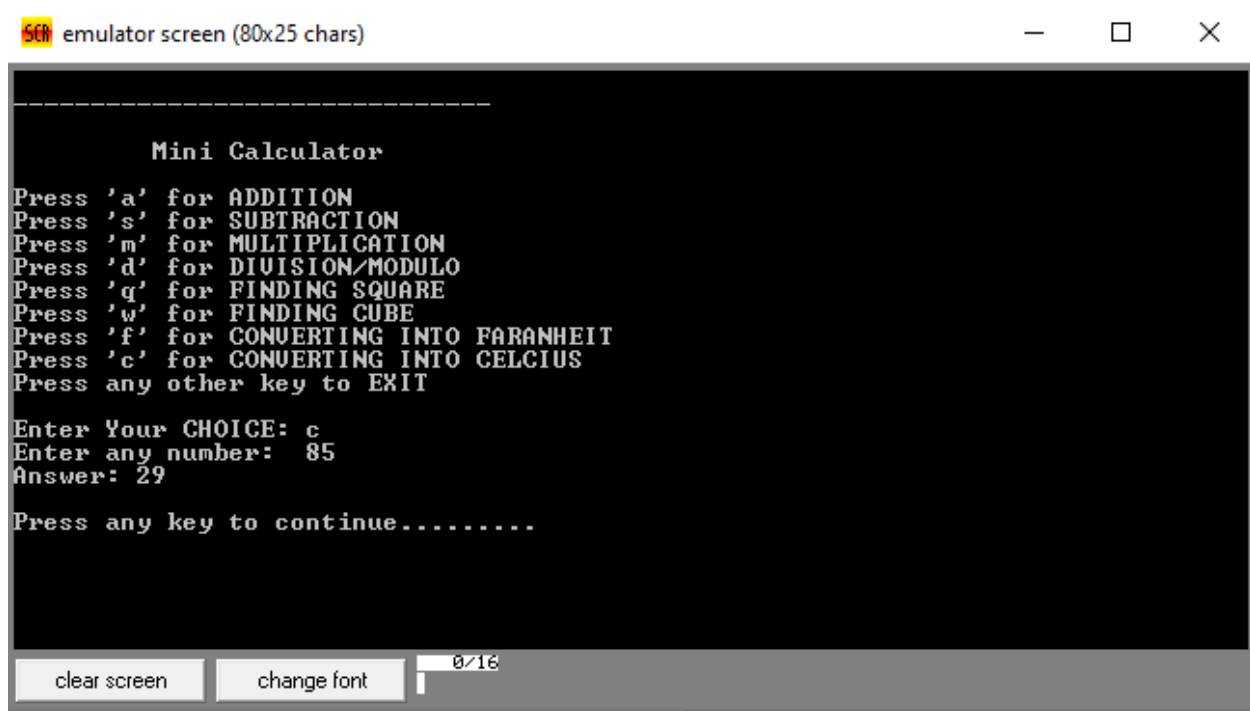
## Fahrenheit to Celsius Converter Function:-



emulator screen (80x25 chars)

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: f  
Enter any number: 0  
Answer: 32  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

## Celsius to Fahrenheit Converter Function:-



The screenshot shows a window titled "emulator screen (80x25 chars)" with a black background and white text. The text displays the menu for the "Mini Calculator", which includes options for addition, subtraction, multiplication, division/modulo, finding square, finding cube, converting to Fahrenheit, and converting to Celsius. The user has selected the Celsius conversion option ('c'), entered the number 85, and the program has calculated the answer as 29. The window also features a status bar at the bottom with buttons for "clear screen" and "change font", and a character count "0/16".

```
-----  
Mini Calculator  
Press 'a' for ADDITION  
Press 's' for SUBTRACTION  
Press 'm' for MULTIPLICATION  
Press 'd' for DIVISION/MODULO  
Press 'q' for FINDING SQUARE  
Press 'w' for FINDING CUBE  
Press 'f' for CONVERTING INTO FARANHEIT  
Press 'c' for CONVERTING INTO CELCIUS  
Press any other key to EXIT  
  
Enter Your CHOICE: c  
Enter any number: 85  
Answer: 29  
  
Press any key to continue.....  
  
clear screen change font 0/16
```

## Conclusion:

While developing this project we have learned a lot of things like how to use registers and variables efficiently. While making this project we faced a lot of errors while debugging. We have learned a lot of things about assembly language. During the development phase we recognize some core critical conceptual skills including the concepts of Computer Organization and Assembly Language.