

**UNIVERSITI SAINS ISLAM MALAYSIA**  
**جَامِعَةُ الْعُلُومِ الْإِسْلَامِيَّةِ الْمَالِيزِيَّةِ**  
ISLAMIC SCIENCE UNIVERSITY OF MALAYSIA

**FACULTY OF SCIENCE AND TECHNOLOGY**

**ASSEMBLY LANGUAGE**

**SKJ4273**

**SEMESTER II – 2015/2016**

**PROJECT**

**SIMPLE CALCULATOR IN ASSEMBLY LANGUAGE**

**GROUP MEMBERS:**

- |                           |         |
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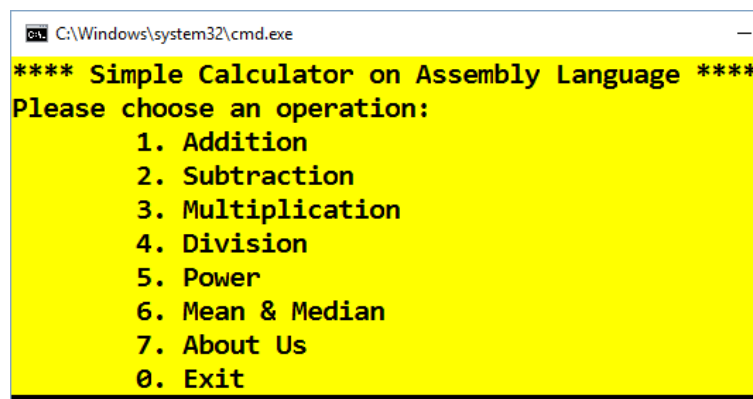
**LECTURER: FARIDA HAZWANI BINTI MOHD RIDZUAN**

## Introduction

This project is development of a simple calculator which is coded using 32-bit Assembly Language. This calculator is able to perform some mathematical primary operations such as Addition, Subtraction, Multiplication, Division on the given numbers by the user. This calculator is also able to receive a set of numbers from user and calculate Total, Mean and Median of the set of numbers. The code of this project consists of two main segment, Data segment and Code segment. And the code segment contains the main procedure and some sub-procedures each which performs a different operation. The user interface of this calculator is designed simple and clear with colorful text and highlight is used to distinct sections in order to provide more efficiency and make it user friendly. This calculator can perform the operations on any signed and/or unsigned numbers. This project is developed in Assembly Language using Visual Studio 2015.

## Menu

When the program is run, a menu will be displayed. This menu contains list of the operations and options. Then user is asked to select an operation by entering the number of operation followed by pressing Enter to perform the operation.



```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Power
6. Mean & Median
7. About Us
0. Exit
```

## Addition Operation

When addition operation is chosen and run, the user will be asked to enter the first and second number. By pressing the Enter key, the addition of two numbers will be performed and the result will be displayed in blue color. User can enter either positive or negative integers. After displaying the result, the menu will be displayed again for user.

```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
    1. Addition
    2. Subtraction
    3. Multiplication
    4. Division
    5. Power
    6. Mean & Median
    7. About Us
    0. Exit
1
+ + + + + Addition + + + + +
Enter first number: -250
Enter second number: 120
Result: (-250) + (+120) = -130
```

## Subtraction Operation

The user will be asked to enter two numbers. Pressing the Enter key the second number will be subtracted from the first number and the result will be displayed in blue color following by the menu.

```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
    1. Addition
    2. Subtraction
    3. Multiplication
    4. Division
    5. Power
    6. Mean & Median
    7. About Us
    0. Exit
2
- - - - - Subtraction - - - - -
Enter first number: -70
Enter second number: 25
Result: (-70) - (+25) = -95
```

## Multiplication

Here the user will be asked to enter two numbers. Pressing the enter key, the product of two numbers will be calculated and the result will be displayed to the user, followed by displaying the main menu.

```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Power
6. Mean & Median
7. About Us
0. Exit
3
***** Multiplication *****
Enter first number: -30
Enter second number: -20
Result: (-30) * (-20) = +600
```

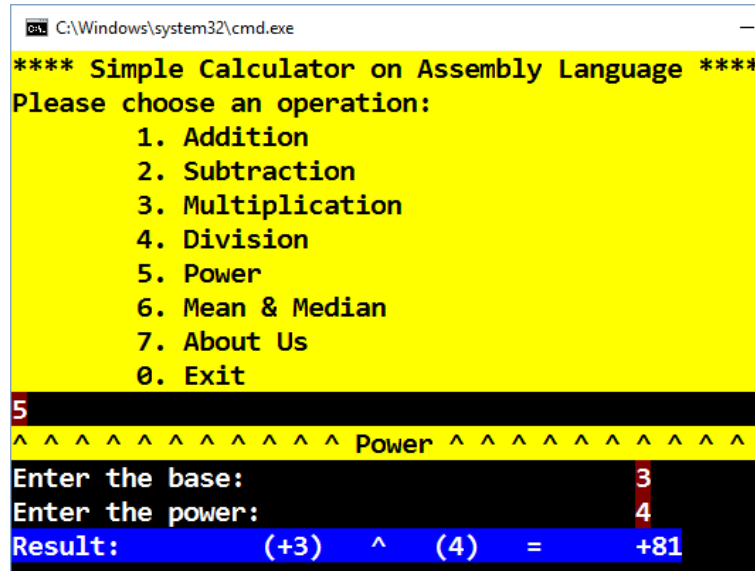
## Division

The menu prompt will asked the user to insert the first input as the dividend, then will ask the second input as the divisor. The dividend will be divided by divisor then the answer will be shown.

```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Power
6. Mean & Median
7. About Us
0. Exit
4
// // // // // Division // // // // //
Enter first number: -80
Enter second number: -20
Result: (-80) / (-20) = +4
```

## Power

The menu prompt will ask the user to key in the first input that is the base, then will ask the user to key in the power as the second input. Then power operation will calculate and simplify the power number and display the result.



```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Power
6. Mean & Median
7. About Us
0. Exit
5
^ ^ ^ ^ ^ ^ ^ ^ ^ ^ Power ^ ^ ^ ^ ^ ^ ^ ^ ^ ^
Enter the base: 3
Enter the power: 4
Result: (+3) ^ (4) = +81
```

## Mean & Median

The user will be asked for the amount of the input. After that the user will be asked to key in the value for each input. All input will be total up and will be divide by range of number to get the mean. In order to get the median, the list of numbers will be sorted ascendingly using bubble sort algorithm. Then if the amount of the input is odd, it will take the number in the middle position as the Median while if it is even, it will total up two middle values and divide it by 2 to get the Median. The result of this operation will be Total, Mean and Median of the list which will be printed in blue color.

```
C:\Windows\system32\cmd.exe

**** Simple Calculator on Assembly Language ****
Please choose an operation:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Power
6. Mean & Median
7. About Us
0. Exit

6
% % % % % % % % % Mean & Median % % % % % % % %
Enter the amount of numbers: 6
Enter the element number 1 : 65
Enter the element number 2 : 29
Enter the element number 3 : 80
Enter the element number 4 : 14
Enter the element number 5 : 58
Enter the element number 6 : 77
The total is: +323
The mean is: +53
The median is: +61
```

## About Us

This option will display some information about our project title, group members and the lecturer.

```
7. About Us
0. Exit

7
~~~~~ About Us ~~~~~
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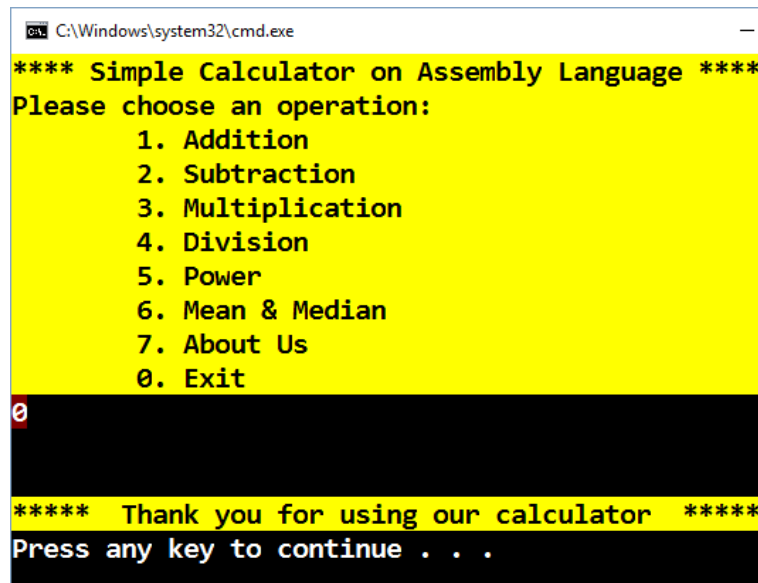
GROUP MEMBERS :
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AHMAD NAZMI BIN NIZAM    1130404

LECTURER: FARIDA HAZWANI BINTI MOHD RIDZUAN
~~~~~
```



## Exit

If the user key in zero (0) as the selected option, the program will be terminated.



```
C:\Windows\system32\cmd.exe
**** Simple Calculator on Assembly Language ****
Please choose an operation:
    1. Addition
    2. Subtraction
    3. Multiplication
    4. Division
    5. Power
    6. Mean & Median
    7. About Us
    0. Exit
0
***** Thank you for using our calculator *****
Press any key to continue . . .
```

The screenshot shows a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The program displays a menu titled "\*\*\*\* Simple Calculator on Assembly Language \*\*\*\*" and asks the user to "Please choose an operation:". The menu lists seven options: 1. Addition, 2. Subtraction, 3. Multiplication, 4. Division, 5. Power, 6. Mean & Median, 7. About Us, and 0. Exit. The user has entered '0' at the prompt. Below the menu, a message "\*\*\*\*\* Thank you for using our calculator \*\*\*\*\*" is displayed, followed by "Press any key to continue . . .".