HIT365 C Programming

Assignment 2

This assignment is worth 15% of the total unit. Marks are given for clarity, presentation, accuracy and also concise and efficient programs. ***This is an individual assignment. If you found guilty of plagiarism, a failure grade will be awarded****.*

The due date of this assignment is ***4th June 2023****. Please submit your answers in* ***one *.c file containing a C program*** *using Learnline (in the "Submit Assessment" tab). Late submissions incur a 10% penalty per day. Make sure comments are included in your programs so that the marker can understand your program.* ***Make sure your program can run in Microsoft Visual Studio available from VMware Horizon if you are using another c compiler. Marks will be deduced if your program cannot run in Microsoft Visual Studio.***

For this assignment, you are required to develop a non-scientific calculator using C. Your calculator should only solve summation, subtraction, division, product, square root and square expressions. Utilizing the math.h header for your program, your calculator should start by prompting the user to enter a two-or-more-operand mathematical equation just like how you would using a non-scientific calculator. Your program should then display the correct answer and the user will have the choice to either continue using the calculator with the current answer to perform further calculations or end the program. Your program should also have a help function to display all the functions of the calculator. A sample output of the program when the user enters "help" is shown below:

```
Type "HELP" or enter a mathematical expression

Calc:\> help

EXIT          Exits this program.
HELP          Displays information about this program.
MEMORY        As part of a mathematical expression the term MEMORY
              is substituted by the value stored in memory. Otherwise,
              the value stored in memory is displayed on-screen.
RESET         Erases stored memory and returns calculator to its
              initial 'start-up' mode.
STORE         Saves current answer to memory.

OPERATOR      DESCRIPTION       SYNTAX
+             addition          [a + b|+a]
-             subtraction       [a - b|-a]
*             multiplication    [a * b|*a]
/             division          [a / b|/a]
^             sqr(x)            a^
#             sqrt(x)           a#

Example:   a^ +b#/ MEMORY (spacing optional)
```

Your calculator must have the following additional functionalities and features:

1. Your calculator should display values accurate up to 6 decimal places.
2. For square and square root operations, you may define any symbol to represent the operations, but the user should be aware of the symbols you used.
3. Have a memory function to store the current answer and can be used later for further calculations and reference.
4. Have a refresh function to erase the stored memory and return the calculator to its initial 'start-up' mode.

Below are some examples of the program output:

```
Type "HELP" or enter a mathematical expression
Calc:\> 3+2
Answer:\> 5
Calc:\> +6
Answer:\> 11
Calc:\> store
ANSWER STORED in MEMORY
Calc:\> 4/memory
Answer:\> 0.363636
Calc:\> _
```

```
Type "HELP" or enter a mathematical expression
Calc:\> 3.5+6^
Answer:\> 39.500000
Calc:\> 6#
Answer:\> 2.449490
Calc:\>
```

```
Type "HELP" or enter a mathematical expression
Calc:\> +64
Answer:\> 64
Calc:\> store
ANSWER STORED in MEMORY
Calc:\> 1/ 2 *3-9+.000001
Answer:\> -7.499999
Calc:\> memory#
Answer:\> 8
Calc:\>
```