Introduction to Computers and Programming Homework 2: MULTI-LINE CALCULATOR

In this homework you are going to write a (C / C++) program that will interpret mathematical calculations from an input file with ".inp" extension. The input file can include keywords, alphanumeric variables, symbols, and operators. Each line is taken as an expression. The result of the calculation will be written to an output file with ".out" extension. The program search all the ".inp" files in the same folder with the executable. And create the separate ".out" files for each input. You have different challenge steps to interpret the inputs. Solve as much challenge as you can**. Do not start form the last one.** I strongly advise to solve them one by one. Each time creating a different project should be a good practice. Do not copy past your previous solution but use the knowledge from it to solve next challenge. The examples are just informal. Your interpreter must calculate different operation combinations.

Keywords: OUT , IN , IF , THEN , ELSE , LOOP , TIMES

OUT	Write out the given variable input in the console and output file.	OUT A
IN	Gets input to a variable from console. (We do not use in challenges.)	IN B
IF	Starts an IF clause. It will followed by THEN and ELSE in one line.	A = IF B<C THEN B ELSE C
THEN		
ELSE		
LOOP	Create a loop that will do the operation between LOOP and TIMES keyword n times. n is given as a constant after TIMES keyword.	LOOP A = B+A TIMES 5

Operations: * , / , + , - , < , > , ==, <= , >= , !, != , =

*	Multiplication	5 * 2 => 10
/	Division	5 / 2 => 2 , 5.0 / 2 => 2.5
+	Addition	5 + 2 => 7
-	Subtraction,	5 – 2 => 3
<	Smaller	5 < 2 => false
>	Grater	5 > 2 => true
==	Equality	5 == 2 => false , 2==2 => true
<=	Smaller or Equal	5 <= 2 => true , 2<=2 => true
>=	Grater or Equal	5 >=2 => true , 2>= 2 => true
!	Not	!5 => false, !0 => true
!=	Not Equal	5 != 2 => true , 2 != 2 => false
=	Assignment	A = 5

Symbols: (,)

Variable Names: Start with an alphabetic character and can continue with alphanumeric characters. Ex: A, B, C, D, E, A1, B2C, C3, D44, …

Challange1: Integer Constants one-character variable names

```
A = 5
B= 10
C= A+B
OUT C
```

Output file must store: 15

Challange2: Double Constants one-character variable names

```
A = 5.3
B = 10.2
C = A+B
OUT C
```

Output file must store: 15.5

Challange3: Integer Division

```
A = 5
B = 9
C = B / A
OUT C
```

Output file must store: 1

Challenge4: Double Division

```
A = 5.0
B = 9
C= B / A
OUT C
```

Output file must store: 1.8

Challange5: Operator Precedence

```
A = 6
B = 2
C = A + B
D = B * A + B * C
OUT D
```

Output file must store: 28

Challange6: Operator Precedence with Parentheses

```
A = 1
B = 2
C = A + B
D = (A + B ) * C + B
OUT D
```

Output file must store: 11

Challange7: using IF THEN ELSE statement

```
A1 = 1
B1 = 2
A2 = IF A1 > B1 THEN A1 ELSE B1
OUT A2
```

Output file must store: 2

Challange8: Combine IF clause with operations

```
A = 1
B = 2
C = IF ( A + B ) <= 3 THEN A ELSE B
OUT C
```

Output file must store: 1

Challange9: Loop Statement

```
A = 2
B = 3
LOOP C = C + A * B TIMES 5
OUT C
```

Output file must store: 30

Challange10: Create your custom input files and try your multi line calculate perferctness

Program Main Screen: No output will be shown on the screen unless the input file includes an IN command. Your program must start and end without any unnecessary input and output commands. Just the OUT commands from the input file should result a console and file output.

IMPORTANT INFO ABOUT HOMEWORK DELIVERY

Homework is collected over mergen system. Any other delivery method is not going to be accepted. While writing the code, students must obey the rules below.

- At the beginning of your code file there must be a comment part giving information about you, compiler environment of your code and any other issue need to be taken into consideration to run the code file.
  Ex:
  ```
  //      Özgür Can TURNA
  //      1306xxxxxx
  //      Date: 02.12.2019
  //      Development Environment: Visual Studio2019
  ```
- The code file should be compiled either in Microsoft Visual Studio or under GCC (CodeBlocks is using this also)
- Only **one code file is collected** so **do not try to send any other file or more than one file**.
- The code file must be named as "1306XXXXXX.cpp" with your student number and .cpp file extention
- **If your program includes extra header files such as "stdafx.h" it takes zero since I cannot compile your code. Be careful about it.**