(CH3) Program Assignment Instructions

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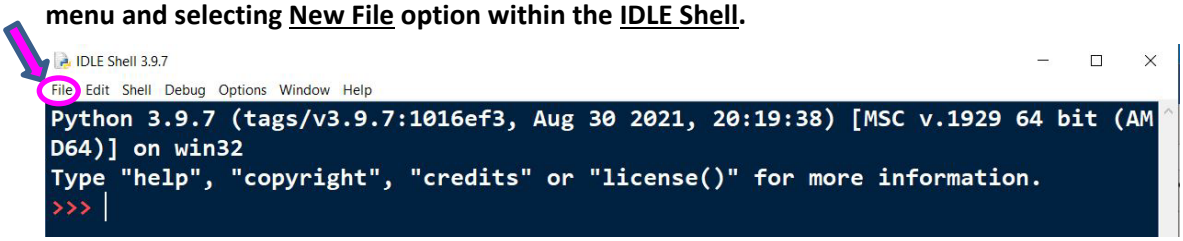
Read and follow the directions below carefully and perform the steps in the order listed. You will be solving one program as instructed and turning in your work electronically via an uploaded file within Eagle Online/Canvas. Make sure and check your work prior to uploading the file.

*Note: Refer to **(SET) How to Download Install and Use Python IDLE (Windows User)** file (**Page 8**) and/or **Use Python IDLE Video** link within **Module 2** on how to **create**, **enter**, **save**, **run**, and **submit** a **script (source code/program) file**.*

Instructions
1. **Using Python IDLE, create a New Empty Script (Source Code/Program) File in your working drive by clicking the File menu and selecting New File option within the IDLE Shell.** 
2. **Save the new Script (Source Code/Program) File with the name CH3LastFirst.py by choosing File menu's Save option *(Note: Make sure to know where you saved the file in your working directory for future submission)*** *(NOTE: Where **LastFirst** should be replaced with your actual **Lastname** and **Firstname**. For Example, if your name is Mary Smith then your file name should be named: **CH3SmithMary.py.** Reminder: You don't need to add the **.py** extension, IDLE will automatically add the extension)* 
3. ***You will develop a Mini Calculator Program as described below:*** The program should prompt the user to enter **4 inputs**: user's name, two integer numbers and an arithmetic (math) operator symbol (for: **, + , - , *, /, //, and %). The program should then display a greeting message with user's name and then an arithmetic expression including the two integers and the operator symbol, followed by an equal sign, and the result of the operation ***(Refer to the table in step 5 below for various sample runs and the corresponding output displayed)***

4. a) The first thing you should enter in your python program script file is a top comment block which includes the following:

```
# Name: Enter your full name here
# Date: Enter today's date here
# Program: Chapter 3 – Selections
# Description: Enter a paragraph description of the program
```
(at least 5 sentences in your own words and do not copy from the program description above)

b) Below the top comment/documention block, type the actual Python code for the problem described in step 3. Make sure the program does the following:

I. Firstly, the program should have the user enter his/her name and display a greeting message with user's name *(refer to output screenshots in the table in step 5 below)*

II. The program should then have the user enter the remaining inputs (two integers and the operator symbol (**, + , - , *, /, //, or %) and display corresponding arithmetic expression including the two integers and the operator symbol, followed by an equal sign, and the result of the operation using if/elif/else statement *(refer to output screenshots in sample runs a - g in the table in step 5 below)*

III. However, if the user entered a /, //, or % operator and the second number is a zero then, make sure to handle DIVISION BY ZERO ERROR! using a nested if/elif/else *(refer to output screenshots in sample runs h - j in the table in step 5 below)*

IV. Ensure that the trailing else statement handles the INVALID OPERATOR ERROR! (any symbols including @, #, $, ^, =, **etc.** are all invalid operators) *(refer to output screenshots in sample runs k and l in the table in step 5 below)*

c) Make sure to include the following in your code:

i. Generally, we use all caps (capital letters) for **CONSTANTS** with underscores separating the words. For example: `ASSIGNMENT_OP`, etc. *(refer to line #s 6 to 8 in the screenshot below)*

ii. Use descriptive and appropriate **identifiers** (variables names) with **smallCamelCase** naming style. For example: `firstInt`, `secondInt`, `operatorSym`, etc. *(refer to line # 15 in the screenshot below)*

iii. Keep proper **documentation** for **understandability of your program** by adding **comments** in the program using line (#) comment explaining the program logic. *(refer to EXAMPLE PROGRAMS listed in Canvas modules and in Revel readings)*

iv. Use proper **indentation** and **blank/line spaces** in your program for **readability of your program** *(refer to EXAMPLE PROGRAMS listed in Canvas modules and in Revel readings)*

c) Refer to the below **Sample Algorithm** and Source Code screenshot below with example statements and HINTS in developing your program:

 # Sample Algorithm:

1 Create any CONSTANTS
2 Prompt user to enter his/her name and store into a variable
3 Output program title with user's name
4 Prompt and read from the user 3 inputs and store into variables
5 Using **nested if/elif/else**, do the following:
   i. If the operator symbol is a ** then, output the expression and the result of exponentiation.
   ii. Else if the operator symbol is a + then, output the expression and the result of addition.
   iii. Else if the operator symbol is a - then, output the expression and the result of subtraction.
   iv. Else if the operator symbol is a * then, output the expression and the result of multiplication.
   v. Else if the (operator symbol is a /) **or** (operator symbol is a //) **or** (operator symbol is a %) then, further use **if/else** as follows:
      - If the second number variable equal to 0 then, output the DIVISION BY ZERO ERROR! message.
      - Else, further use **if/elif/else** as follows:

- If the operator symbol is a / then output the expression and the result of normal-division.
- Else if the operator symbol is a // then output the expression and the result of integer-division.
- Else if the operator symbol is a % then output the expression and the result of modulus operation (which is remainder of integer dividing first number by second number).

vi. Else, output INVALID OPERATOR ERROR! message with the invalid operator symbol displayed.

CH3RaoSuma.py - C:\COSC1436Py\Sp23\CH3RaoSuma.py (3.10.4)

File Edit Format Run Options Window Help

```
# Name: Enter your full name here
# Date: Enter today's date here
# Program: Chapter 3 - Selections
# Description: Enter a paragraph description of the program (at least 5 sentences i

# CONSTANTS
GREET = "Hello"
TITLE = "Welcome to Mini Calculator Program!"
LINE = '~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~'
DIV_ZERO_ERROR = "DIVISION BY ZERO ERROR!"
INVALID_OP_ERROR = "is an INVALID OPERATOR!"
ASSIGNMENT_OP = '='

# prompt/input user's name
name = input("Enter your name: ")

# display greeting, title, and line
print(LINE)
print(GREET, name, TITLE)
print(LINE)

# prompt/input for first integer number
firstInt = int(input("Enter first integer: "))
# prompt/input for second integer number here

# prompt/input for operator symbol here

print(LINE)

# use if/elif/else and check all the operators one by one here
# first begin with if block to check ** operator
if opSym == '**':
    print(firstInt, opSym, secondInt, ASSIGNMENT_OP, firstInt ** secondInt)
# Use elifs and check for +, -, and * operators like above


# use elif with 'or' logical operator to check for /, //, and % here
# HINT: if opSym == '/' or opSym == '//' and so on...
    # start an if/else to handle division by zero error here
    if secondNum == 0:
        # print DIV_ZERO_ERROR message here
    else:
        # start another if/elif/else and check for /, //, and % here
        if opSym == '/':
            print(firstInt, opSym, secondInt, ASSIGNMENT_OP, firstInt / secondInt)
        # use elif/else and check for // and %


else:
    # print invalid operator error message
```

example prompt/input for **firstInt**

Complete the remaining prompts/inputs for **secondInt** and **opSym** here...

example **print** statement of **(**exponentiation)

Complete remaining **elif** blocks to check and print results for **+, -, *** here...

Add another **if/else** block to check **division by 0** error

complete the remaining **elif/else** to check **//** and **%**

5 After completing your program as instructed, make sure to **Run** your program/script file to obtain the output/results as shown in the sample run screenshots in the table below for various inputs:

a.

```
Enter your name: Suma Rao
Hello Suma Rao Welcome to Mini Calculator Program!
Enter first integer: 4
Enter second integer: 3
Enter Operator Symbol: **
4 ** 3 = 64
```

b.

```
Enter your name: Riya
Hello Riya Welcome to Mini Calculator Program!
Enter first integer: 4
Enter second integer: 0
Enter Operator Symbol: +
4 + 0 = 4
```

c.

```
Enter your name: Tuan
Hello Tuan Welcome to Mini Calculator Program!
Enter first integer: 7
Enter second integer: 0
Enter Operator Symbol: -
7 - 0 = 7
```

d.

```
Enter your name: Mustafa
Hello Mustafa Welcome to Mini Calculator Program!
Enter first integer: 4
Enter second integer: 3
Enter Operator Symbol: *
4 * 3 = 12
```

e.

```
Enter your name: Tayo
Hello Tayo Welcome to Mini Calculator Program!
Enter first integer: 3
Enter second integer: 4
Enter Operator Symbol: /
3 / 4 = 0.75
```

f.

```
Enter your name: Mary
Hello Mary Welcome to Mini Calculator Program!
Enter first integer: 3
Enter second integer: 4
Enter Operator Symbol: //
3 // 4 = 0
```

g.

```
Enter your name: James
Hello James Welcome to Mini Calculator Program!
Enter first integer: 3
Enter second integer: 4
Enter Operator Symbol: %
3 % 4 = 3
```

h.

```
Enter your name: Tom
Hello Tom Welcome to Mini Calculator Program!
Enter first integer: 66
Enter second integer: 0
Enter Operator Symbol: /
DIVISION BY ZERO ERROR!
```

i.

```
Enter your name: Jerry
Hello Jerry Welcome to Mini Calculator Program!
Enter first integer: 55
Enter second integer: 0
Enter Operator Symbol: //
DIVISION BY ZERO ERROR!
```

j.

```
Enter your name: Sid Patel
Hello Sid Patel Welcome to Mini Calculator Program!
Enter first integer: 77
Enter second integer: 0
Enter Operator Symbol: %
DIVISION BY ZERO ERROR!
```

k.

```
Enter your name: Megan
Hello Megan Welcome to Mini Calculator Program!
Enter first integer: 4
Enter second integer: 44
Enter Operator Symbol: !!
!! is an INVALID OPERATOR!
```

l.

```
Enter your name: katy
Hello katy Welcome to Mini Calculator Program!
Enter first integer: 25
Enter second integer: 25
Enter Operator Symbol: =
= is an INVALID OPERATOR!
```

6. You may now proceed to Program Assignment INSTRUCTIONS and UPLOAD link within this module and follow the steps in the link or follow the steps below to submit your work as a **File Upload** (an attached **.py** file):

    a. Choose the **Start Assignment** button,

b. Choose **File Upload** tab,
c. Choose **Browse** to locate your **script (source/program) file** to add,
d. Choose **Submit Assignment** to complete file upload.

NOTE: ONE OF THE COMMON MISTAKES IS THAT STUDENTS ENTER PYTHON COMMANDS/STATEMENTS IN THE "IDLE SHELL" DIRECTLY AND SAVE THE RESULTS TO A FILE AND SUBMIT WHICH IS INCORRECT!!!

INSTEAD...

YOU SHOULD FOLLOW THE ABOVE STEPS TO CREATE A NEW SCRIPT (SOURCE CODE/PROGRAM) FILE FROM THE IDLE SHELL, SAVE THE FILE, ENTER PYTHON STATEMENTS (PROGRAM) INTO THE FILE, RUN YOUR PROGRAM, AND SUMBIT THAT SCRIPT (SOURCE CODE/PROGRAM) FILE AND NOT THE OUTPUT OF THE IDLE SHELL!!!