CMPSC-132: Programming and Computation II
Fall 2018

Homework 3

Due Date: 10/20/2018, 11:59PM
100 pts

Instructions:

- The work in this assignment must be completed alone.
- The file name must be HW3.py (incorrect name files will get a -10 point deduction)
- When any function returns an error, it must be a string containing "error"
- Do not include test code outside any function in the upload. Remove all your testing code before uploading your file. That includes user-defined input()

Goal:

Modify the function *calculator*(*expr*) so that it supports exponentiation. This operation will be represented in the string as ^ unlike Python's **. An example of a valid expression is "-5 + 60 / 3^3 * 4 - 2 * 4 ^2". In this assignment, more than one consecutive exponentiation is not supported.

Notes:

- This is a straightforward upgrade of HW2 and there is no starter code
- You will also have to modify findNextOpr and exeOpr to include ^ (which is ** in Python)
- In your submission, include all functions in your HW3.py script (calculator, findNextOpr, isNumber, getNextNumber and exeOpr)

Function requirements:

✓ The function must **return** the computed value if *expr* is a correct formula, otherwise it must return an error message.
✓ When any function returns a numeric value, it must be float
✓ Do not use *exec* or *eval* function. You will not receive credit if your program uses any of the two functions anywhere
✓ All five functions from HW2 must work

Grading Notes:

- The grading script will feed 5 randomly chosen test inputs, each for 20 points. One of them will be an input that should cause an error such as "4 * / 2 + 5 ^", whose expected returned value is an error message.

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Example:
>>> calculator("-5 + 60 / 3^3 * 4  -  2 * 4^2")
-28.11111111111111
>>> calculator("4^2 /  2^2")
4.0
>>> calculator("-4^ /  2^2")
'error'
```

Deliverables:

- Include all the functions in your script named HW3.py. Submit it to the HW3 CANVAS assignment before the due date