CS 1301

Individual Homework 3 – Conditionals & Loops

Due: Monday September 14th before 11:55pm

Out of 100 points

Files to submit: 1. HW3.py
THIS IS AN INDIVIDUAL ASSIGNMENT!

You should work individually on this assignment. You may collaborate with other students in this class. Collaboration means talking through problems, assisting with debugging, explaining a concept, etc. Students may only collaborate with fellow students currently taking CS 1301, the TA's and the lecturer. You should not exchange code or write code for others. For individual assignments, each student must turn in a unique program. Your submission must not be substantially similar to another student's submission. Collaboration at a reasonable level will not result in substantially similar code.

For Help:

- TA Helpdesk – Schedule posted on class website.
- Email TA's or use Piazza Forums

Notes:

- **Don't forget to include the required collaboration statement (outlined on the syllabus).**
- **Do not wait until the last minute** to do this assignment in case you run into problems.
- **Read the entire specifications document before starting this assignment.**

Part 1 – Create the Functions

1. applyToTech | 10pts
2. guessAge | 15pts
3. encryptMessage | 15pts
4. numberPyramid | 20pts
5. reverseMultiTable | 25pts
6. enoughFor | 15pts

Function Name: **applyToTech**

Parameters:

reading – an integer representing the Critical Reading score.
math – an integer representing the Mathematics score.
writing - an integer representing the Mathematics score.

Return Value:

"Congratulations, you have been admitted to Georgia Tech. Go Jackets!",
or **"I am sorry to inform you we cannot offer you admission to Georgia Tech"**,
or **"Invalid scores. Try again."**

Test Cases:

applyToTech(680,690,650)
I am sorry to inform you we cannot offer you admission to Georgia Tech
applyToTech(850,700,100)
Invalid scores. Try again.
applyToTech(700,700,700)
Congratulations, you have been admitted to Georgia Tech. Go Jackets!

Description:

Write a function that determines whether the user's SAT test scores will be enough to be admitted to Georgia Tech. The user will enter the test scores: Critical Reading, Mathematics, and Writing (in this order). If the scores are in the following ranges (inclusively) and the total score is also on its range (inclusively) the student must be admitted: **Critical Reading** (680-800), **Mathematics** (690-800), **Writing** (650-800), and **Total**: (2060-2400). Note that there could be the case that each score is in its range but the total is not, that student will not be admitted. Let the student know if he or she has been admitted or not to Georgia Tech. If admitted **return** the string "Congratulations, you have been admitted to Georgia Tech. Go Jackets!" otherwise **return** the string "I'm sorry to inform you we cannot offer you admission to Georgia Tech". You may assume the user will only enter positive integers, but let the user know if he/she entered invalid scores above the 800 point maximum. (scores > 800 are invalid scores).

Function Name: **guessAge**

Parameters:

age – a string or integer representing the age to be guessed.

Return Value:

None

Test Cases:

>>> guessAge(20)
Guess the Age: **10**
Try again. Guess the Age: **20**
Great Job! It took you 1 tries to guess the age
Thank you for playing!
>>> guessAge(45)
Guess the Age: **30**
Try again. Guess the Age: **Quit**
Don't give up just because things are hard!
Thank you for playing!
>>> guessAge(15)
Guess the Age: **10**
Try again. Guess the Age: **12**
Try again. Guess the Age: **13**
Try again. Guess the Age: **18**
Try again. Guess the Age: **20**
Try again. Guess the Age: **16**
You have exceeded the number of tries.
Thank you for playing!

Description:

Write a function that will have an age as a parameter and will ask the user to guess that age. The user will have a maximum of 6 chances to guess (after the 6th try if it's wrong let the user know he has exceeded the number of tries). The user may quit the game whenever he wants by writing (QUIT, quit or Quit) instead of an age and you must tell him an encouraging message like: (Don't give up just because things are hard!). If the user guess the age correctly, tell him he did a great job and how many tries it took him to guess it. No matter what happens, at the end of the game thank the user for playing.
Hint: The built in functions like .lower() might be helpful.

Function Name: **encryptMessage**

Parameters:

secretMsg – a string representing the message to be encrypted

Return Value:

A string representing the encrypted message

Test Cases:

encryptMessage("my123password")
my@#$password
encryptMessage("Dan()123Barrun")
d^an**@#$b^arrun
encryptMessage("PASS99cats"))
p^a^s^s^**cats

Description:

Write a function that takes a message that the user wants to encrypt and return the encrypted string. You must use a loop in your function (either a for-loop or a while-loop). Hint: you can use built in functions like *isupper()*, or others that might help you. The user trusts an encryption algorithm that has the following rules:
Character: In the alphabet and uppercase [A-Z]
Replace with: Lowercase character and add a ^ character afterwards
Character: In the alphabet and lowercase [a-z]
Replace with: Do not change
Character: 1
Replace with: @
Character: 2
Replace with: #
Character: 3
Replace with: $
Character: Any other character
Replace with: *

Function Name: **numberPyramid**

Parameters:

num – An integer that specifies the number of rows of the pyramid. You may assume the number is an integer between 2-9.

Return Value:

None

Description:

Write a function that takes in the number of rows of the pyramid as a parameter. The function will then draw a number pyramid on screen using the print function. See below in the test cases for clarification. DO NOT HARD CODE THE PRINTOUTS. You must use a for-loop. Hint: string manipulation and formatting may be helpful.

Test Cases:

You have *num* number of rows, but note that there are two 1s, four 2s, six 3s, eight 4s, etc.

numberPyramid(6)

```
666666666666
55555   55555
4444     4444
333       333
22         22
1           1
```

numberPyramid(4)

```
44444444
333   333
22     22
1       1
```

Function Name: **reverseMultiTable**

Parameters:

n – An integer that specifies the number of the times table. You may assume the number is an integer between 2-9.

Return Value:

None

Description:

Write a function that takes in the number of the times table (up to 9). And print a reverse multiplication table. DO NOT HARD CODE THE PRINTOUTS. Using a nested loop it's not the only way to do it but definitively the easiest. Check the test cases for the EXACT format on how to print the table. You must follow this format all the columns and rows must be indented equally. Hint: use string formatting and learn how to print without adding a new line.

Test Cases:

```
python>>> reverseMultiTable(5)
 25 20 15 10  5
 20 16 12  8  4
 15 12  9  6  3
 10  8  6  4  2
  5  4  3  2  1
Ok
```

```
python>>> reverseMultiTable(7)
 49 42 35 28 21 14  7
 42 36 30 24 18 12  6
 35 30 25 20 15 10  5
 28 24 20 16 12  8  4
 21 18 15 12  9  6  3
 14 12 10  8  6  4  2
  7  6  5  4  3  2  1
Ok
```

Function Name: **enoughFor**

Parameters:

None

Return Value:

None

Formula :

Final exam grade= (100× *desired grade*- (100 -*w*)×*current grade*) /*w*

A = [90,100] B= [80,90) C= [70,80) D= [60,70)

Description:

Write a function that will calculate the minimum grade a user needs to get in his or her final Exam in order to get the grade wanted. You will ask the user, what Letter Grade he/she will like to obtain (only valid inputs should be A, a, B, b, C, c, D, or d. other than this you must let the user know there was a mistake and end the function.) You will then ask the user what's the current percentage grade she or he has on the class (you may assume the user will always enter a number between (0-100] and finally you will ask how much is the final worth (0,100] (same as for the percentage, you may assume a valid user input). After this calculate with the formula the minimum score on the final, and tell the user if it's impossible to get that desired grade (hint: if final grade > 100%).

Test Cases:

python>>>enoughFor()

"What letter-grade would you like to get?(A-D)" **A**

"What's your current grade on the class in % (0-100)" **87**

"How much is the final worth?" **20**

I'm sorry it's impossible for you to get this grade

python>>> enoughFor()

"What letter-grade would you like to get?(A-D)" **C**

"What's your current grade on the class in % (0-100)" **80**

"How much is the final worth?" **20**

You need 30.0 in the final to get a C in the class

Grading Rubric

1. **applyToTech**
   Correct Heading (name of function + params) 1pts
   Handle Invalid scores (any >800) 3pts
   Based on scores access correct case (admitted or not).....4pts
   Returns a value of type *String.....*
   .....2pts
   TOTAL.....**10 PTS**

2. **guessAge**
   Ask the user to guess the age (input box) 1pts
   Uses a while loop..... 2pts
   Handles when tries have been exceeded..... 3pts
   Handles when user quits (if case sensitive -1pts) 2pts
   Handles correctly when user guesses the age (include in print statement the number of tries it took him).....5pts
   Prints(no return) what expected (always thanks at end).2pts
   TOTAL.....**15 PTS**

3. **encryptMessage**
   Iterates through the parameter string..... 2pts
   Handles every case in the encryption rules table (-2pts for

every rule missing or not handled correctly).....10pts
Returns the correct message of type String..... 3pts
TOTAL.....**15 PTS**

4. **numberPyramid**
   Correct header and params..... 2pts
   Uses a for loop..... 3pts
   Prints the exact format of pyramid (check test cases).....15pts
   TOTAL.....**20 PTS**

5. **reverseMultiTable**
   Correct header and params 2pts
   Correctly calculates numbers (e.g. using a nested loop) 8pts
   Prints the exact format of the table (check test cases).....15pts
   TOTAL.....**25 PTS**

6. **enoughFor**
   Ask the user for the data needed (three inputs) 2pts
   Handles a not valid letter-grade from user(exit function).3pts
   Handles the scenario to get that grade (final>100) 3pts
   Print string with correct data and in the same format 7pts
   TOTAL.....**1**

5 PTS

Homework created by Daniel Barrundia.