% Trevor Swan - tcs94
% ENGR 130 Module 1 Report
% Section E
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Question 3)
I will assume that the user knows exactly how much energy they use a month, and that they are fully capable of running the script and answering the question asked.

1. Prompt the user for the Number of kWh they use each month, storing their input in a variable ‘x’
2. Create a variable named ‘charge’ and set it equal to the amount the company charges over time kWh ($0.066)
3. Calculate the total amount of money charged for the period by multiplying the ‘charge’ variable with the ‘x’ value, storing the result in a variable ‘c’
4. Display the users energy usage and total cost for the period in a succinct sentence

Question 4)
This is completely computer based, and needs no assumptions

1. Create a vector ‘random_vector’ that contains 10 random integers from 1 to 100
2. Find the sum of the 10 random integers in a loop by adding each consecutive number with the sum of the previous numbers, storing the result in a variable named ‘random_sum’
3. Find the average of the digits by dividing the ‘sum_vector’ by 10, storing the result in a variable named ‘random_average’
4. Using a loop, subtract the ‘random_average’ from each of the integers, squaring each result and adding all of them together. Use a variable named ‘sum_diff_sq’ to find the sum store the result
5. Calculate the standard deviation by dividing the ‘sum_diff_sq’ variable by 9 and then taking the square root of the result. The result should be stored in a variable named ‘std_dev’
6. Display the ‘random_average’ and ‘std_dev’ variables obtained above to the user using descriptive words
7. Use built-in functions (*mean*) to calculate the true average of ‘random_vector’, storing the result in a variable named ‘computer_avg’
8. Use built in functions (*std*) to calculate the true standard deviation of ‘random_vector’, storing the result in a variable named ‘computer_std’
9. Display the values obtained using built-in functions to the user using descriptive words

Question 5)
I will assume that the user is fully capable of running any programming language, and that they know how to input a vector correctly based on the directions given to them in the original prompt.

1. Prompt the user to create a vector of length and values of their choice, storing their response in a vector named ‘vector1’
2. Create a variable ‘length_var’ that contains a scalar equal to the length of ‘vector1’
3. Create a vector of length ‘length_var’ that contains all zeros, naming it ‘vector2’
4. Use a loop that runs ‘length_var’ times, the number of times this runs should be stored in a variable named reverse.
5. To rewrite ‘vector2’, each of ‘vector2’s values, or ‘vector2(reverse)’, will be equal to the ‘length_vector’-(reverse-1) term of vector1. For example, when a vector of 7 length is created and reverse = 1, vector2(1) is equal to vector1(7-(1-1)), or vector1(7).
6. Display the original vector to the user, followed by the new, reversed vector

Question 6)
I will assume that the user is aware of the Beaufort wind scale and knows the strength of the wind in their area based on this measurement. The user is also perfectly capable of reading prompts, answering questions, and understanding error messages. I will also assume that the user will ONLY enter integer values.

1. Prompt the user for the wind level (0-12) in their environment according to the Beaufort wind scale, storing their response in a variable named wind_value.
   Note: A single conditional statement is needed for the following code.
2. Check to see if the value the user entered is less than 0. If this is true, display an error message that alerts the user that they have entered a number below the bounds of the question asked. The code should not continue to run if this happens.
3. Check to see if the value entered by the user is greater than 12. If this is true, display an error message that alerts the user that they have entered a number above the bounds of the question asked. The code should not run if this happens.
4. If, and only if, the previous 2 steps have not been met, you must now identify the type of weather based on wind_value
5. Check to see if the wind_value is equal to 0, if this is true, display the wind_value and say ‘There is no wind.’
6. If the previous statement is not met, check to see if wind_value is less than or equal to 6. If this is true, display the wind_value and say ‘There is a breeze.’
7. If the previous statements are not met, check to see if the wind_value is less than or equal to 9. If this is true, display the wind_value and say ‘This is a gale.’
8. If the previous statements are not met, check to see if the wind_value is less than or equal to 11. If this is true, display the wind_value and say ‘It is a storm.’
9. If the previous statements are not met, then the wind_value MUST be equal to 12. Display the wind_value and say ‘Hello, hurricane!’
10. End the conditional statement