Algorithm Design for Assignment 1 27/09/2024

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For COMP 248 Section H – Fall 2024

Algorithm 1: Solar Roof Energy Calculator

1. Declare Scanner and Variables
2. Display a welcome message: "*Solar Roof Energy Calculator*".
3. Prompt the user to enter the following values:
    - Number of solar panels (numPanels) (integer).
    - Wattage rating of each solar panel (panelWattage) (integer).
    - Average number of sunlight hours per day (sunlightHours) (double).
    - Efficiency of solar panels (efficiency) in percentage (double).
4. Calculate the daily energy production using the formula:

    $$DailyEnergy(kWh) = numPanels \times panelWattage \times sunlightHours \times efficiency / (1000 \times 100)$$

5. Calculate the annual energy production by multiplying daily energy production by 365.
6. Display the results:
    - Daily Energy Production in kilowatt-hours (kWh).
    - Annual Energy Production in kilowatt-hours (kWh).
7. Display a closing message: "Thank you for using the Solar Roof Energy Calculator!".
8. Close Scanner

Algorithm 2: String Inspector

1. Declare Scanner and Variables.

2. Display a welcome message: "********* String Inspector *********".
3. Prompt the user to enter : a given sentence(and assume that it is longer than 5 characters), a given word and a separator.
4. Check if the sentence contains the given word using the contains() method and store the result.
5. Check if the sentence starts with the letter "i" using the startsWith() method and store the result.
6. Replace all occurrences of the letter "a" in the sentence with "e" using the replaceAll() method and store the modified sentence.
7. Join the sentence and the word using the specified separator with String.join() and store the result.
8. Find the index of the first occurrence of the letter "a" in the sentence using indexOf() and store the result.
9. Retrieve the character at the third position (index 2) of the sentence using charAt() and store the result.
10. Display the results:
    - Whether the sentence contains the word.
    - Whether the sentence starts with "i".
    - The sentence with "a" replaced by "e".
    - The joined string.
    - The index of the first occurrence of "a".
    - The character at the third position.

11. Display a closing message: "Thank you for using the String Inspector tool. Have a great day!".
12. Close Scanner