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Section: COMP 248 Section R – Fall 2024

Assignment 1 – Algorithms for Questions 1 and 2

Algorithm 1: Solar Roof Energy Calculator

1. Start

2. Initialize scanner to capture user input.

3. Print welcome message:
   "Welcome to Algorithm 1: Solar Roof Energy Calculator."

4. Prompt the user to input the number of solar panels:

   o Store this input in numPanels.

5. Prompt the user to input the wattage rating of each solar panel:

   o Store this input in panelWattage.

6. Prompt the user to input the average number of sunlight hours per day:

   o Store this input in sunLightHours.

7. Prompt the user to input the efficiency of the solar panels as a percentage:

   o Store this input in efficiency.

8. Calculate daily energy production using the formula:
   dailyEnergy = (numPanels * panelWattage * sunLightHours * efficiency) / 100000

9. Calculate annual energy production using the formula:
   annualEnergy = 365 * dailyEnergy

10. Output the daily energy production:
    "Daily Energy Production Amount is: [dailyEnergy] kWh"

11. Output the annual energy production:
    "Annual Energy Production Amount is: [annualEnergy] kWh"

12. Print exit message:
    "Thank you for using the Solar Panel Roof Energy Calculator. Come back soon!"

13. Close the scanner.

14. End

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Algorithm 2: String Inspector Program

1. Start

2. Initialize scanner to capture user input.

3. Print welcome message:
    "Welcome to Algorithm 2: String Inspector Program."

4. Prompt the user to input a sentence (greater than 5 characters):

    o   Store this input in mainSentence.

5. Prompt the user to input a search word:

    o   Store this input in searchWord.

6. Prompt the user to input a separator string:

    o   Store this input in separatorString.

7. Perform operations on the sentence and output results:

    o   Check if mainSentence contains searchWord with, contains() method:
        Output the result. Returns either True or False

    o   Check if mainSentence starts with the letter 'i' with, startWith("I") method:
        Output the result. Returns either True or False

    o   Replace all occurrences of the letter 'a' with 'e' in mainSentence with,
        replaceAll("a", "e") method:
        Output the result.

    o   Join mainSentence, separatorString, and searchWord:
        Output the result.

    o   Find the index of the first occurrence of the letter 'a' in mainSentence:
        Output the result. (Value will be an integer.)

    o   Output the character at the 3rd position (index 2) of mainSentence.

8. Print exit message:
    "Thank you for using the String Inspector Program. Come back soon!"

9. Close the scanner.

10. End