UNIVERSITY OF CALGARY

CPSC 319
Data Structures, Algorithms, and Their Applications

Winter 2024

Question 5

- Write a Java method, numberOfVowels, that takes a string s and returns the number of vowels (a, e, i, o, u) in s (s consists of only lowercase English alphabet letters).

- Test case:
  - s = "java" -> 2
  - s = "hello" -> 2
  - s = "cpsc" -> 0
  - s = "computer" -> 3

Question 6

- Write a Java method, isPalindrome, that takes a string s and returns true if s is palindrome and false otherwise (s consists of only lowercase English alphabet letters).
- A palindrome string is a sequence of characters that reads the same forward as backward, like "level".

- Test case:
  - s = "level" -> true
  - s = "java" -> false
  - s = "radar" -> true
  - s = "zz" -> true

Question 7

- Write a Java method, checkFormula, that takes three integers, a, b, and c and returns true if they can be used correctly in one of the following arithmetic formulas, "a + b = c", "a - b = c", or "a x b = c", and false otherwise.

- Test case:
  - a = 5, b = 0, c = 0 -> true
  - a = 5, b = 0, c = 5 -> true
  - a = 2, b = 3, c = -2 -> false
  - a = -2, b = 3, c = 1 -> true
  - a = 4, b = -3, c = 0 -> false

Question 8

- Write a Java method, checkArray, that takes an array of int values (1D), a, and returns true if there is a pair of distinct elements of the array whose product is even and false otherwise.

- Test case:
  - a = {1, 3, -1} -> false
  - a = {11, -7, 9, 5, -3} -> false
  - a = {1, 2, 3} -> true
  - a = {-5, -3, -1, 0, 1, 3, 5} -> true
  - a = {4} -> false