UNIVERSITY OF CALGARY

CPSC 319
Data Structures, Algorithms, and Their Applications

Winter 2024

Question 9

- Write a Java method, howManySteps, that takes an integer m and returns the number of times one must repeatedly divide this number by 2 before getting a value less than 2.

- Test case:
  - m = -5 -> 0
  - m = 0 -> 0
  - m = 2 -> 1
  - m = 5 -> 2
  - m = 19 -> 4
  - m = 1073741825 -> 30

Question 10

- Write a Java method, summationOfDigits, that takes an integer m and returns the sum of its digits.

- Test case:
  m = -5 -> 5
  m = 0 -> 0
  m = -11 -> 2
  m = 57 -> 12
  m = 111 -> 3
  m = 1073741825 -> 38

Question 11

- Write a Java method, isPalindrome, that takes an integer m and returns true if m is palindrome and false otherwise (don't convert the integer to string).
- A palindrome number is a sequence of digits that reads the same forward as backward, like 121 and 6.

- Test case:
  m = -1 -> false
  m = 6 -> true
  m = 0 -> true
  m = -11 -> false
  m = 121 -> true
  m = 35653 -> true

Question 12

- Write a Java method, reverseArray, that takes an array of int values (1D), a, and reverses the order of elements in a. Your method should not return anything, and it should change the array itself.

- Test case:
  a = {1, 3, -1} -> a = {-1, 3, 1}
  a = {11, -7, 9, 5, -3} -> a = {-3, 5, 9, -7, 11}
  a = {1} -> a = {1}
  a = {1, 2, 3, 4, 5, 6} -> a = {6, 5, 4, 3, 2, 1}