Lab # 5

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CPSC 1150 - 003

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Lab Title: Triangle Lab

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Department: CPSC

Program Bank Account

File Name: Lab5.java

Purpose: prompts the user for an integer number, n then prints out all the prime palindrome numbers that are less than or equal to n.

Input: n

Output: the prime and palindrome numbers that are less than or equal to n.

Technical Information:

(You should fill the following information based on compiler and computer you are using).

Compiler: IntelliJ IDEA Community Edition 2023.1.1

Computer: (R) Core(TM) i7-10870H CPU @ 2.20GHz 2.21 GHz, 16 GB of RAM

Operating System: Windows 10 Home Single Language

Language: Java

Program Logic (Pseudocode)

**is\_prime(int n)**

Algorithm: Checks if the number is a prime number or not and returns true or false depending if the number is a prime number or not

(definition)

0.1 n = value of i that is passed through after each iteration

START

1. FOR (i = 2 to n)

IF (n % i == 0)

RETURN FALSE

1. RETURN TRUE

END

**is\_palindrome(int n)**

Algorithm: Checks if the number is a palindrome or not and returns true or false depending if the number is a palindrome or not.

(definition)

0.1 n = value of i that is passed through after each iteration

START

1. start 🡨 n
2. sum 🡨 0
3. d 🡨 checksDigit(n)
4. WHILE (d<0)

r 🡨 n % 10

sum 🡨 sum + (r \* 10^(d-1))

n 🡨 n/10

d 🡨 d – 1

1. RETURN (start == sum)

END

**checksDigit(int n)**

Algorithm: Checks how many digits there are in the number and returns how many digits there are in the number

(definition)

0.1 n = value of i that is passed through after each iteration

START

1. count 🡨 0
2. WHILE (n>0)

n 🡨 n/10

count 🡨 count + 1

1. RETURN count

END

**main()**

START

1. OUTPUT “What is the value of n? “
2. n 🡨 INPUT
3. FOR (i = 2 to n)

IF (is\_prime is TRUE and is\_palindrome is TRUE)

OUTPUT i + “ “

1. OUTPUT “are all palindrome prime numbers less than or equal to

Generate your test cases based on the specifications in your lab assignment. Follow following format for each test case: (Refer to external document of your first lab)

*purpose*

*input*

*output*

*expected value*

*passed or failed*

Test Cases:

Test Case 1: There are prime palindromes less than the users input

n = 102

Output: 2 3 5 7 11 101 are all palindrome prime numbers less than or equal to 102

Expected: 2 3 5 7 11 101 are all palindrome prime numbers less than or equal to 102

Passed

Test Case 2: There are no prime palindromes less than the users input

n = 1

Output: are all palindrome prime numbers less than or equal to 1

Expected: are all palindrome prime numbers less than or equal to 1

Passed