MATH 335E Programming Algorithms

Lab-4 / CRN: 21193

Instructor: Assoc. Prof. Dr. Burcu Tunga
Lab Assistant: Res. Asst. Celal Umut Yaran

Question 1 (Binary Code)

Write a Java source code that inputs an integer containing only 0s and 1s (i.e., a binary code) and prints its decimal equivalent. For example, the decimal equivalent of the binary code 1100101 is $1 * 2^0 + 0 * 2^1 + 1 * 2^2 + 0 * 2^3 + 0 * 2^4 + 1 * 2^5 + 1 * 2^6 = 101$. In your code, you should use a Java static method named *decimal*, which takes a binary code and returns its decimal equivalent. Your Java code should display an error message if the number contains digits other than 0 and 1.

Example Scenario:
> Enter the binary code: 1100101
> The result is 101

> Enter the binary code: 11201
> Invalid code

Question 2 (Palindrome)

A palindrome is a sequence of characters that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write an application that reads in a five-digit integer and determines whether it's a palindrome. In your code, you should use a Java static method named *palindrome*, which takes a five-digit integer and return $+1$ if the integer is palindrome or return -1 if the integer is not palindrome.
If the number is not five digits long, display an error message.

Example Scenario:
> Enter 5-digit number: 12421
> 12421 is a Palindrome number.

> Enter 5-digit number: 1325
> Invalid number.

Question 3 (Right Triangle)

Write an application that reads three nonzero integers and determines and prints whether they could represent the sides of a right triangle (a type of triangle with one of its angles equal to 90 degrees). Your code should include a Java static method named *right_triangle*, which takes three nonzero integers and return $+1$ if they could represent the sides of a triangle or return -1 if not.

Example Scenario:
> Enter a length for triangle: 3
> Enter a length for triangle: 4
> Enter a length for triangle: 5
> It is a right triangle

> Enter a length for triangle: 3
> Enter a length for triangle: 5
> Enter a length for triangle: 7
> It is not a right triangle