RMIT University

School of Engineering

Advanced Mechatronics System Design – MANU2451

LabVIEW Test 2017

Student Name:

Student Number:

You have 60 minutes to finish this test and return this page at the end of the test period. If this page is not returned, you will not receive any mark for this assessment. After you finished testing your code, put all your files in a zip-folder, and then submit the zipped folder through Blackboard → Assignments → Programming Assessment.

If you have any questions, please raise your hand. This is an open book assessment and you can use all available materials including Google. **However, this is an individual assignment and no form of communication with any other person (except your lecturer) is allowed during this test.**

Task 1: Please save and submit as "YourStudentNumber_Task1" (4 Points)

On a Cartesian coordinate system, two different points have the coordinates (x1, y1) and (x2, y2) respectively. You will write a code which calculates the distance between the two points.

Write a program which allows you to:

    a. Key in 4 numbers: x1, y1, x2 and y2. – 1 point

    b. Calculate the distance between the two points. – 2 points

    c. Display the distance on the front panel. – 0.5 points

    d. The program has to run continuously until you press stop. – 0.5 points

Task 2: Please save and submit as "YourStudentNumber_Task2" (6 Points)

In this task, you will create a counter which either increments or decrements depending on whether a push-button is being pressed.

    a. First, create counter using Shift Register which counts only upwards / increments (i.e. 0, 1, 2, 3…) at each iteration. – 2 Points.

    b. Each iteration needs to be 1s long. – 0.5 Points.

    c. Use a few icons to program the following: If push button is pressed, then pass through the number "1" (positive one); if push button is not pressed, then pass through the number "-1" (minus one). – 2 Points

    d. Combine part a. and c. to accomplish the main goal of this task. 1.5 Points.

Task 3: Please save and submit as "YourStudentNumber_Task3" (5 Points)

In this task, you will create a program to find the average of 100 random numbers.

    a. Create a "Structure" which stops after 100 iterations. – 0.5 points.

    b. Each iteration needs to be 0.1s long. – 0.5 points.

    c. Within the above structure, bring in a "random number", and then create a code to cumulatively sum up all the 100 numbers. Hint: You may need to use a shift register to do this. – 2 points.

    d. When the iteration stops (i.e. after 100 iterations), pass the value of cumulative sum to outside of the structure, and divide this value by 100 to get the average. Show this value using an indicator. – 2 points.

<u>Task 4: Please save and submit as "YourStudentNumber_Task4" (5 Points)</u>

Note for 2018 students: You won't be tested on this because we did not cover case structure in class.

In this task, you will create a selection of menu items, along with the expected cooking time. If the cooking time is more than 10 minutes, then the code will state "Too long", otherwise the code will state "OK".

a. Create an enum-constant with the following items: - 1 Point
   - Pizza
   - Fries
   - Noodle

b. Replace the enum-constant with an enum-control. – 0.5 Point

c. Connect the enum-constant with a Case structure. The default Case structure only has two cases. Add the third case. – 0.5 Points.

d. Give the following cooking time for each case, and show this number in an indicator. – 1.5 Point.
   - Pizza – 12 Minutes
   - Fries – 5 Minutes
   - Noodle – 8 Minutes

e. If the cooking time is more than 10 minutes, then the code will state "Too long", otherwise the code will state "OK". Hint: You should use String constant and String indicator for this task. – 1.5 Point.