**Initio Programming: Variables, Numbers, Booleans and Strings**



**AIM:** This exercise sheet provides additional programming exercises using variables, numbers and strings. It assumes familiarity with WS1-14.

**Exercise 1**: Write a program that will take two readings from the ultrasonic sensor one second apart. If they are not equal it prints a message containing the readings and stating that they are not the same. This message should be printed on one line.

**Exercise 2**:  Write a program will take a reading from the left and the right infrared sensors. If the readings are the same it will reverse for 10 seconds, otherwise it will turn away from whichever sensor detects something.

**Exercise 3**: Write a program which asks the user to write either forward or backward and then asks them to enter a number under 10. The robot should then wait 10 seconds (to allow the robot to be disconnected) and then move either forwards or backwards for the relevant number of seconds. If any of the inputs are incorrect the robot does nothing.

**Exercise 4**: Write a program which asks the user to write either forward or backward and then asks them to enter a number under 10. The robot should then wait 10 seconds followed by moving either forwards or backwards for the relevant number of seconds. If the user enters an incorrect input, then the robot should explain the problem and prompt for the input again.

**Exercise 5:** Write a program which loops asking the user to input F, B, L, R (for forward, backward, left, right) and gets the robot to move in whichever direction they last indicated. As it moves it should print out the value from the ultrasonic sensor every 5 seconds. After 10 readings it should stop.

**Exercise 6:** Write a program which loops asking the user to input F, B, L, R (for forward, backward, left, right) and gets the robot to move in whichever direction they last indicated for 10 seconds and then stops. It then continues to ask this question (with an additional option of S for stop) and changes direction or stops as indicated by the user.

**Exercise 7:** Write a program which asks the user to enter a time in seconds. The robot should then move forward for that number of seconds. While doing so it should take an ultrasonic sensor reading every second and at the end of the program print out the average value of the ultrasonic sensor while it was moving.



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