**Virtual Pi2Go Programming: Functions Exercises**

**AIM:** This exercise sheet provides additional programs using functions.

**Exercise 1:** Create a functions when\_switch\_pressed() which waits until the switch is pressed before continuing – and sleeps for 3 seconds after the switch is pressed to give time for the switch to be switched off. Illustrate its use in a program which starts the robot moving once the switch is pressed and stops the robot when the switch is pressed again.

**Exercise 2:** Create a function forward\_for(t) where t is *time in seconds*. Which moves the robot forward for t seconds. Illustrate its use in a program which prompts the user to enter a time in seconds and then moves the robot forward for that number of seconds.

**Exercise 3:** Create a function average\_distance() which returns the average value from the ultrasonic sensor taken over ten readings taken 1 second apart. Illustrate its use in a program that drives the robot forwards, takes ten distance readings, stops and prints out the average distance.

**Exercise 4:** Create a function follow\_line() that moves forward if neither line sensor detects anything and turns left if the left line sensor detects something and right if the right line sensor detects something. Test this out in **line\_following.xml** world by placing the robot so that its line sensors are either side of the black line.

**Exercise 5:** Create a function avoid\_obstacle() that implements obstacle avoidance behaviour and a function follow\_line(). Illustrate their use in a program that prompts the use to select whether the robot should either avoid obstacles or follow a line or exit the program. If the switch is pressed the program should prompt for new behaviour.

**Exercise 6:** Write a function brightest() which returns either ‘left’ or ‘right’ depending upon which side detects the brightest light. Illustrate its use with a program that will turn towards the brightest light point using the turn(side) function from the worksheet.



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