**Virtual Pi2Go Programming: WS16 Sample Answers and Trouble Shooting**

**WS16**

**Exercise 1:**

import simclient.simrobot as pi2go

import time

def flash\_LEDs():

 pi2go.setAllLEDs(500, 500, 500)

 time.sleep(1)

 pi2go.setAllLEDs(0, 0, 0)

 time.sleep(1)

 pi2go.setAllLEDs(500, 500, 500)

 time.sleep(1)

 pi2go.setAllLEDs(0, 0, 0)

pi2go.init()

while (not pi2go.irCentre()):

 pi2go.forward(10)

pi2go.stop()

flash\_LEDs()

while (pi2go.irCentre()):

 pi2go.spinLeft(10)

 time.sleep(5)

pi2go.stop()

flash\_LEDs()

while (not pi2go.irCentre()):

 pi2go.forward(10)

pi2go.stop()

flash\_LEDs()

A cleverer answer to Exercise 1 uses a second function as follows:

import simclient.simrobot as pi2go

import time

def flash\_LEDs():

 pi2go.setAllLEDs(500, 500, 500)

 time.sleep(1)

 pi2go.setAllLEDs(0, 0, 0)

 time.sleep(1)

 pi2go.setAllLEDs(500, 500, 500)

 time.sleep(1)

 pi2go.setAllLEDs(0, 0, 0)

def while\_no\_obstacle():

 while (not pi2go.irCentre()):

 pi2go.forward(10)

 pi2go.stop();

pi2go.init()

while\_no\_obstacle()

flash\_LEDs()

while (pi2go.irCentre()):

 pi2go.spinLeft(10)

 time.sleep(5)

pi2go.stop()

flash\_LEDs()

while\_no\_obstacle()

flash\_LEDs()

**Question 1&2:** The turn(side) function turns left or right depending upon its argument. The following program turns the robot right for 10 seconds.

**Exercise 2:**

def turn\_obstacle(side):

 if (side == 'right'):

 pi2go.spinLeft(10)

 while(pi2go.irRight()):

 continue

 else:

 pi2go.spinRight(10)

 while(pi2go.irLeft()):

 continue

 pi2go.stop()

pi2go.init()

turn\_obstacle('left')

**Question 3:** returns the value of the obstacle sensor on the left, right or centre depending upon its argument.

**Exercise 3:**

import simclient.simrobot as pi2go

import time

def obstacle(side):

 if (side == 'left'):

 return pi2go.irLeft()

 elif (side == 'right'):

 return pi2go.irRight()

 else:

 return pi2go.irCentre()

pi2go.init()

print(obstacle('left'))

print(obstacle('centre'))

print(obstacle('left'))

**Exercise 4:**

def opposite(side):

 if (side == 'left'):

 return 'right'

 else:

 return 'left'

**Exercise 5:**

import simclient.simrobot as pi2go

import time

def obstacle(side):

 if (side == 'left'):

 return pi2go.irLeft()

 elif (side == 'right'):

 return pi2go.irRight()

 else:

 return pi2go.irCentre()

def turn(side):

 if (side == 'left'):

 pi2go.spinLeft(10)

 else:

 pi2go.spinRight(10)

def turn\_until(side):

 turn(side)

 while(obstacle(opposite(side))):

 continue

 pi2go.stop();

def opposite(side):

 if (side == 'left'):

 return 'right'

 else:

 return 'left'

pi2go.init()

turn\_until('left')

**Ex16**

**Exercise 1:**

import simclient.simrobot as pi2go

import time

def when\_switch\_pressed():

 while (not pi2go.getSwitch() == 1):

 continue

 time.sleep(3)

pi2go.init()

when\_switch\_pressed()

pi2go.forward(10)

when\_switch\_pressed()

pi2go.stop()

**Exercise 2:**

import simclient.simrobot as pi2go

import time

def forward\_for(t):

 pi2go.forward(10)

 time.sleep(t)

 pi2go.stop()

pi2go.init()

t1 = input("Enter a time in seconds")

forward\_for(int(t1))

**Exercise 3:**

import simclient.simrobot as pi2go

import time

def average\_distance():

 count = 0

 total = 0

 while (count < 10):

 total = total + pi2go.getDistance()

 time.sleep(1)

 count = count + 1

 return total/10

pi2go.init()

pi2go.forward(10)

average = average\_distance()

pi2go.stop()

print(str(average))

**Exercise 4:**

def follow\_line():

 while True:

 while (pi2go.irLeftLine()):

 pi2go.spinLeft(10)

 while (pi2go.irRightLine()):

 pi2go.spinRight(10)

 while (not pi2go.irLeftLine() and not pi2go.irRightLine()):

 pi2go.forward(10)

**Exercise 5:**

import simclient.simrobot as pi2go

import time

def avoid\_obstacle():

 while (not pi2go.getSwitch()):

 while (pi2go.irCentre() and not pi2go.getSwitch()):

 pi2go.spinLeft(10)

 while (not pi2go.irCentre() and not pi2go.getSwitch()):

 pi2go.forward(10)

def follow\_line():

 while (not pi2go.getSwitch()):

 while (pi2go.irLeftLine() and not pi2go.getSwitch()):

 pi2go.spinLeft(10)

 while (pi2go.irRightLine() and not pi2go.getSwitch()):

 pi2go.spinRight(10)

 while (not pi2go.irLeftLine() and not pi2go.irRightLine() and not pi2go.getSwitch()):

 pi2go.forward(10)

pi2go.init()

while True:

 todo = input("Obstacle or Line or Stop? O/L/S")

 if (todo == "O"):

 avoid\_obstacle()

 elif (todo == "L"):

 follow\_line()

 else:

 break

 pi2go.stop()

**Exercise 6:**

import simclient.simrobot as pi2go

import time

def brightest():

 if (pi2go.getLightFL() > pi2go.getLightFR()):

 return 'left'

 elif (pi2go.getLightFL() < pi2go.getLightFR()):

 return 'right'

 else:

 return 'neither'

def turn(side):

 if (side == 'left'):

 pi2go.spinLeft(10)

 elif (side == 'right'):

 pi2go.spinRight(10)

 else:

 pi2go.stop()

pi2go.init()

while (not brightest() == 'neither'):

 turn(brightest())

pi2go.stop()



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