**Name: Session:**

**Programming I**

**Lab Exercise 12/3/2019**

1. **Turtle Challenge**

Using the following function, program a turtle to generate the following image. Do not forget to hide the turtle.

|  |  |
| --- | --- |
| def drawCross():  t.forward(100)  t.backward(200)  t.forward(100)  t.left(90)  t.forward(100)  t.backward(200)  t.home() |  |

1. **The Disoriented Turtle**

Using the random walk function, determine the distance from home the turtle ends up after a 100 step walk. You could either use the distance function you have written, or check out the Python documentation that might have a simpler way. Your program should print to the shell the distance in pixels. Note: The turtle start coordinate is (0, 0) which is located in the center of the screen. The coordinate system is the same as in your math class (positive X to right and positive Y is up). The function takes 3 parameters (Turtle, number of steps, and distance each step). The third parameter is optional. If not provided, the default parameter 20 is used.

def randomWalk(t, steps, distance = 20):

for x in range(steps):

t.left(random.randint(0, 359))

t.forward(distance)

1. **Trials and Tribulations**

Sometimes turtles just have bad days. To compensate for this, run the above experiment 10 times and calculate the average distance the turtle wandered for the 10 trials.

1. **Maximum distance**

Modify the random walk function to find the maximum distance the turtle traveled in the 100 step journey.

1. **Average Maximum Distance**

Use the same technique you used in problem 3 to find the average maximum distance the turtle traveled in 10 trials using the same 100 step walk.

**When you have completed these programs, attach the source code to this sheet and turn in.**