

# Introduction

Our goal for today is to get familiar with the python standard module Turtle and practice working with objects. And also we will practice in reading and understanding documentation.

Turtle has very nice documentation on official python website:

<https://docs.python.org/3/library/turtle.html>

I recommend you to spend at least 15 minutes on reading this chapter.

Solve all tasks using an object oriented approach.

<https://docs.python.org/3/library/turtle.html#use-object-oriented-turtle-graphics>

In comparison to reeborg, the turtle has plenty of methods! It has not only `forward()` method, the analogue of `move()`, but also `backward()` for example. And moreover it has `right()` in addition to `left()`!

Authors of the turtle were much more generous than the authors of reeborg!

Install:

```
pip install PythonTurtle
```

For mac you have to install (change 3.10 to your python version):

```
brew install python-tk@3.10
```

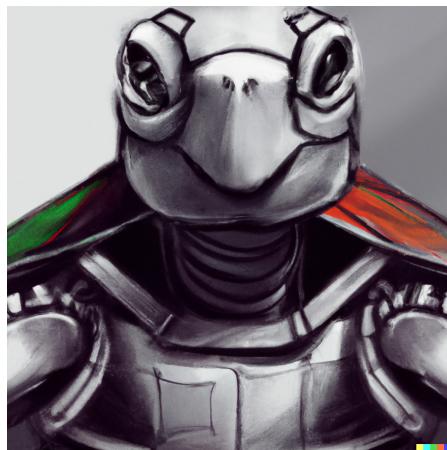
# Problem set:

## Problem 1.

Draw a square. (It may have any size or even shape).

**Learning objections:** install dependencies and import module, create an object, explore methods forward(), right()/left(), and .screen.mainloop()

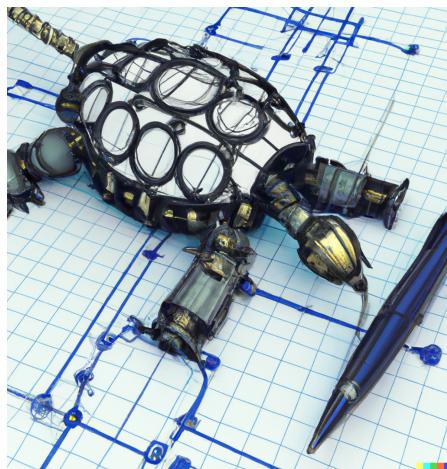
How to change shape.



## Problem 2.

Draw a dotted line. (Any length, any thickness, any color, any direction)

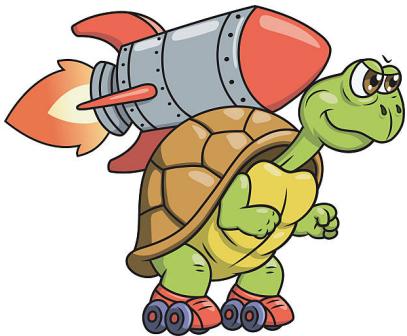
**Learning objections:** there is a hydraulic pen connected to the turtle's butt, it's possible to turn it on and off with penup and pendown methods.



## Problem 3. From the Triangle to the Decagon.

Draw a sequence of n-angles figures. Each figure has the same length of the side. Use different colors for each figure.

**Learning objections:** how to change the color of the drawing (check docs). Can you speed up a turtle?



## Problem 4. Random walk.

There is such thing as random walk [https://en.wikipedia.org/wiki/Random\\_walk](https://en.wikipedia.org/wiki/Random_walk)

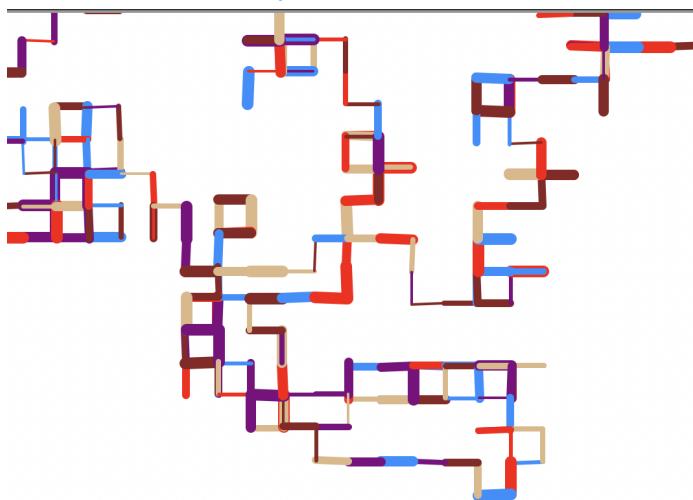
The model of random walk has a tons of applications in physics, math, and many other fields.

Let's build this simulation. Rules:

1. Each step has the same length.
2. Each step has a different random color.

Please, choose your favorite colors out of this table:

<https://cs111.wellesley.edu/labs/lab02/colors>



## Problem 5. The Spirograph

Let's draw a simple spirograph with different colors. Google it, try to make different spirograms. What about the logo from the beginning of turtle module documentation?

**Learning objections:** How to draw a circle? How to set the heading? How to choose random color?

