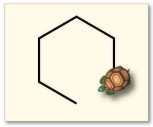
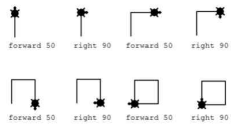
The turtle class

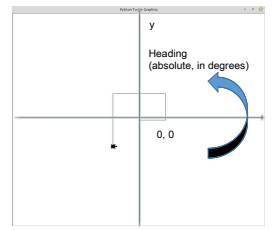
A bit of nostalgia

Turtle





The turtle world



Python module

- Documentation:
  - https://docs.python.org/3/library/turtle.html
- Getting started:

```
import turtle                   # import the turtle module
turtle.bye()                    # close existing screens, if any

my_turtle = turtle.Turtle()     # make a variable called robot
my_turtle.shape('turtle')       # set the shape of the robot to 'turtle'
#turtle.bye()                   # Closes the turtle screen
```

Some turtle methods

Method	Parameters	Description
Turtle	None	Creates and returns a new turtle object
forward	distance	Moves the turtle forward
backward	distance	Moves the turtle backward
right	angle	Turns the turtle clockwise
left	angle	Turns the turtle counter clockwise
up	None	Picks up the turtles tail
down	None	Puts down the turtles tail
color	color name	Changes the color of the turtle's tail
fillcolor	color name	Changes the color of the turtle will use to fill a polygon
heading	None	Returns the current heading
position	None	Returns the current position
goto	x,y	Move the turtle to position x,y
begin_fill	None	Remember the starting point for a filled polygon
end_fill	None	Close the polygon and fill with the current fill color
dot	None	Leave a dot at the current position
stamp	None	Leaves an impression of a turtle shape at the current location
shape	shape name	Should be 'arrow', 'classic', 'turtle', 'circle' or 'square'

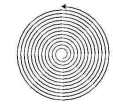
Source: https://runestone.academy/runestone/books/published/thinkcspy/PythonTurtle/SummaryofTurtleMethods.html#turtle-methods

Exercise 1: regular polygon

1. Have the turtle draw a square:
   - Move forward n steps, turn right 90 degrees. Repeat 4 times.
2. Have the turtle draw a square using a for loop.
3. Have the turtle draw an n-sided regular polygon using a for loop and a variable n

Exercise 2: Spiral

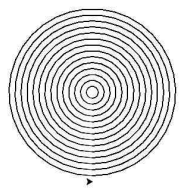
- Draw the following shape:



- Note the circle function: turtle.circle(radius, extent=None, steps=None)
- A spiral is just a bunch of partial circles, each starting from a different position and having an increasing radius.

Exercise 3: Concentric circles

- Steps:
  - Draw a complete (small) circle with radius r
  - Move down (-y) by n steps
  - Draw a circle with radius r + n
  - Repeat



Example: plotting weather graphs

- See code:
  - https://github.com/dvanderelst-python-class/python-class/blob/spring2021/class_code/weather_turtle.py
- This example uses the openweathermap api:
  - https://openweathermap.org/api

Some fun examples

- https://stackoverflow.com/questions/39853005/drawing-a-fractal-tree-in-python-not-sure-how-to-proceed
- https://github.com/DCoelhoM/Snake-Python
- https://compucademy.net/classic-snake-game-with-python-turtle-graphics/
- https://stackoverflow.com/questions/39585354/show-how-a-projectile-turtle-travels-over-time