Python Turtle

- https://realpython.com/beginners-guide-python-turtle/
- https://docs.python.org/3/library/turtle.html

What is Resolution?

- Your laptop has a resolution, this is described in terms of how many pixels can be displayed at once.

- A Youtube or TicToc video will have a resolution, described the same way, for instance 720p or 1080p which is also expressed as:
  - 720p = 1280x720
  - 1080p = 1280x1080

- The first number is usually the width, the second is the height.

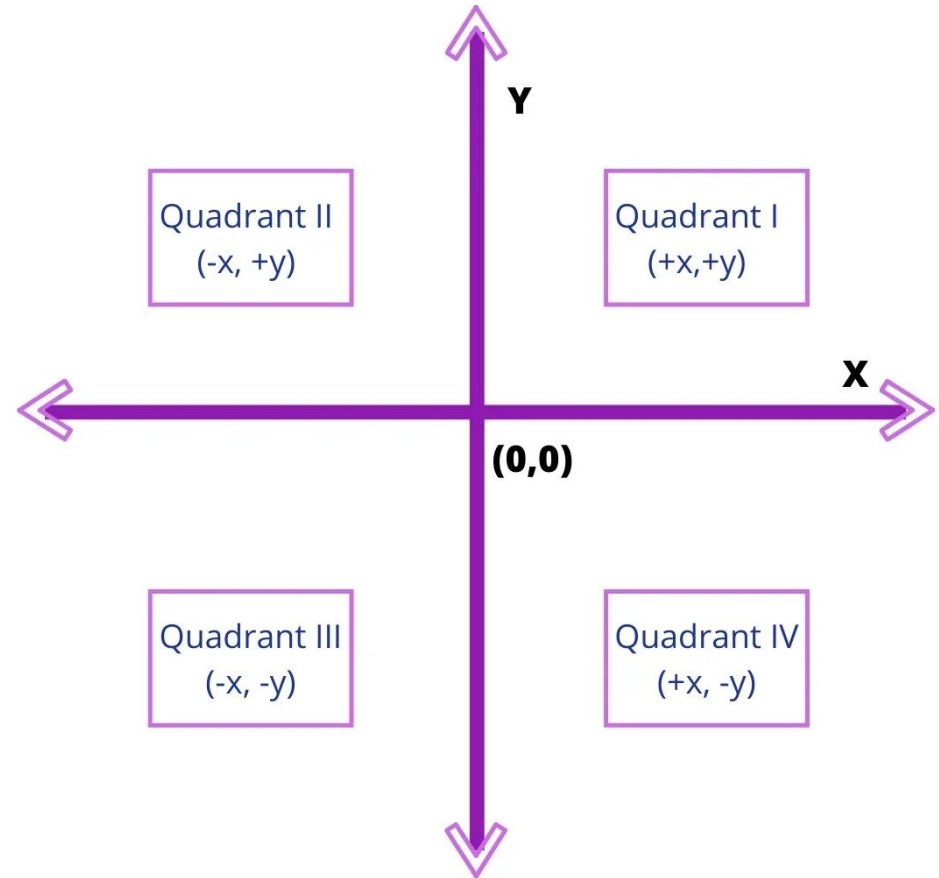- So a 720p video is 1280 pixels wide and 720 pixels high

X, Y Coordinates

- In Computer Graphics the position of a pixel is expressed as its X, Y coordinates.
- The Y is the position across the screen or windows width, while the X is the position across its height.

Python Window Coordinates

- The goto(x, y) command for turtle positions the turtle in the window.

- The coordinates are a bit weird, when X=0, and Y=0, the turtle is in the middle of the window!

- Top left of a 360x360 window is:
  - X=-160, Y=160

- Bottom right of a 360x360 window is:
  - X=-160, Y=-160

Y

Quadrant II
(-x, +y)

Quadrant I
(+x,+y)

X

(0,0)

Quadrant III
(-x, -y)

Quadrant IV
(+x, -y)

Samples

- square.py – draws a square (obviously :-)

- Initials.py – try to draw your initials with the turtle

- race.py – race those turtles

- pong.py – a version of the rather ancient game called pong, advanced users might be able to figure out how to make it single player

Exercises

- Change square.py
  - Change the colour
  - Draw a different shape
  - See how many shapes you can draw all at once!
- Change race.py
  - Change the **Finished** text to display the name of the winning turtle, for example change 'Finished' so it says 'Blue Finished First', of course if blue finished first!
    - You will need to think a little about this and perhaps use an if statement with conditions!
  - Rig the race, so that your favourite coloured turtle always wins!
- Improve the pong game
  - You have to move the paddle to make the ball bounce of it, otherwise it goes right through
  - Make it single player (no left paddle)