

Outline for November 10, 2025

Reading: none

Due: Homework 3, due November 12, 2025

1. Sets [*sets.py*]
2. Round-off errors [*roundoff.py*]
3. Conditionals [*condexp.py*]
4. List comprehension [*listcomp.py*]
5. Iterators [*gener.py*]
6. “f” strings
7. Command-line options and arguments [*opts.py*]
8. Searching
 - (a) Linear search [*linsearch-u.py*, *linsearch-s.py*]
 - (b) Binary search [*binsearch-1.py*, *binsearch-2.py*]
9. Sorting
 - (a) Bubble sort [*bubblesort.py*]
 - (b) Merge sort [*mergesort.py*]
 - (c) Select sort [*selectsort.py*]
 - (d) Quicksort [*quicksort.py*]
 - (e) Putting them all together [*sorts.py*]
10. Turtle graphics
 - (a) What turtle is; `import turtle`
11. Drawing a figure: a box with a hat [*tbox.py*]
 - (a) Set up the window to draw in: `Screen()`
 - (b) Create the turtle: `Turtle()`
 - (c) Cursor for drawing
 - (d) Move cursor: `forward()`, `backward()`, `left()`, `right()`
 - (e) Wait for the window to close: `mainloop()`
12. Titles, background, and such [*tfancybox.py*]
 - (a) Window
 - i. Color of the window background: `background()`
 - ii. Title of the window: `title()`
 - (b) Turtle, more properly called “pen”
 - i. Shape of the turtle: `shape()`
 - ii. Speed of the drawing: `speed()`
 - iii. Color of the drawn line: `color()`
 - iv. Thickness of the line (pixels): `pensize()`
 - v. Hide the turtle: `hideturtle()`
13. Plotting points and graphing
 - (a) Drawing lines: `penup()`, `pendown()`
 - (b) Move turtle: `setpos()`

- (c) Write text: `write()`
 - (d) Draw a dot at the current position: `dot()` [*tchaosdots.py*]
 - (e) Draw a line from the current position to another: `goto()` [*tchaosline.py*]
14. Curves in turtle
- (a) Drawing parts of a circle [*tcircle.py*]
 - (b) Drawing a curve [*tcurve.py*]
15. Turtle race [*turtlerace.py*]
- (a) Create turtles
 - (b) Create goals
 - (c) Create die
 - (d) Program structure:
 - i. Check to see if either turtle has reached its goal; if so, that turtle wins
 - ii. If not, ask the player whose turn it is to roll the die (ie, press ENTER)
 - iii. Select random number from die list
 - iv. Advance turtle appropriately (multiply by `LENGTH_OF_STEP`)
 - v. Loop until someone wins

A very good tutorial (and the turtle race) is <https://realpython.com/beginners-guide-python-turtle>