final review/overview

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## all topics

* simple variable types
* arithmetic and logical operators
* repr() (print representation)
* logical expressions
* indexing and slicing (strings, lists, arrays, data frames …)
* string methods (.lower(), .upper(), .replace(), .isalpha()
* lists, list operators (+=), list methods
* **mutability**
* **conditionals and flow control**
	+ if, for, while (break)
	+ nested loops
* functions
* modules
* tuples, tuple methods
* files
	+ opening and closing, .closed
	+ .read(), .readlines(), next, StopIteration
	+ .strip(), .split(), type conversion
* sets (**non-ordered, unique**): .add, .remove, …
* dictionaries
	+ indexing (not by number unless keys are numeric)
	+ .keys(), .values(), .items(), for
	+ inversion
* random numbers (random or numpy.random)
	+ random.seed()
	+ .choice, .uniform, .randrange
	+ Monte Carlo methods/simulations
	+ use np.mean or np.sum on a bool array to count fraction or total
* numpy
	+ arrays
		- defining with dtype
		- .shape
		- zeros(), ones(), eye(), identity, reshape(), flatten(), arange(), linspace(), copy(), fill()
		- operators, indexing, slicing, selections by logical
		- vectorized and non-vectorized operators (np.sin vs math.sin)
		- operations over axes: sum, mean, min, max, newaxis
		- np.logical.[and,not,or]
* numerics
	+ underflow (too close to zero)
	+ overflow (integer and float)
	+ loss of precision (small number + large number)
	+ nan
* matplotlib
	+ .plot (uses index as x-variable if no x provided: draws lines by default)
	+ fig, ax = plt.subplots()
	+ .scatter (draws points by default)
	+ .hist (histogram)
	+ .bar (barplot)
	+ set\_xlabel, set\_xticklabels, suptitle (recognize)
	+ label, legend
	+ imshow (image)
* error handling
	+ raise
	+ try/except (pass)
	+ ValueError (inappropriate value), NameError (undefined symbol), IndexError (incorrect indexing), TypeError (inappropriate type)
* pandas
	+ DataFrame and Series
	+ indexing: .loc and .iloc; indexing columns d[["key1","key2"]]; extracting columns as d.key1
	+ read\_csv(), .to\_csv()
	+ operations across rows/columns
	+ .groupby, .aggregate (collapse by group: MC only)