

Topics For Second Midterm

CS 110-03, Introduction to Computer Science I

Fall, 2011

- `range` function with two args
- Python lists
 - `len` function
 - Sequence types
 - Mutable vs. immutable types
 - Linear search
 - Selection sort
 - Bubble sort
 - Insertion sort
- Swapping values
- Objects: attributes (variables) + methods (functions)
- Dot notation for accessing attributes/methods
- list `append` method
- `del` operator
- Argument passing: pass-by-value, pass-by-reference
 - Python: immutable objects are, effectively, passed by value: changes made to the parameters are not reflected in the arguments.
 - Python: mutable objects are, effectively passed by reference: changes made to *parts* of the parameters are made in the arguments.
- Histograms and how to code them.
- Recursion, infinite recursion
- Binary search
- Performance of binary, linear search: `time` function from `time` module
- `xrange` vs `range`

- Dictionaries: key, value, item, initialization, order
- `__name__` variable, “`__main__`” string, driver programs, incremental development
- Importing user code
- Performance of dictionary lookup vs reverse lookup vs linear search vs binary search
- Wrapper functions
- Files, open function, readline method, write method, close method
- File pointer, file I/O buffering
- `pickle` module, `dumps` (create a string for output), `loads` (convert a string into an object) functions
- Directed graphs, vertices, directed edges, adjacency matrix, adjacency list.
- Depth-first search
- Matrix: list of lists. Nested for loops.
- Web crawlers
- Very basic html
- URLs, relative, absolute URL
- String slices
- `get` function from `requests` module
- Building a reverse index