Topics list - programming part

Topics for the first partial

1. Introduction
2. Variables, values, operations, `if` statement, `while` loop
3. Lists, `for` loop, checking if number is prime
4. More lists and loops.
5. Functions, recursion
6. Binary search
7.
     - Backtracking technique: queens problem.
     - Merge sort
8. Eratosthenes sieve

Topics for second partial

9. "Higher order functions" - function can take other function as an argument; `lambda` expression to create an unnamed function in-line
10.
     - QuickSort
     - Basic classes; creation of a class, `__init__` method, fields and method, an object of a class.
11. Interaction:
     - Plotting things using `matplotlib.pyplot` library.
     - Opening files and reading/writing data from/to files.
12.
     - Backtracking technique: Sudoku solver.
     - Implementation of a graph algorithms: DFS.
13. Graph algorithms:
     - Kruskal's algorithm for minimum spanning tree
     - Dijkstra's algorithm.
14. Hash map implementation. Built-in python data structures: `dict` for dictionary, `set` for set.