Stacks & Queues

Chapter No.	10
Status	Completed

- Stacks
  - Last-in-first-out (LIFO)
  - Items can only be added and removed from the top of the stack
  - Common Stack Operations
    - is_empty
      - Checks whether the stack is empty
    - size
      - Returns the number of items in the stack
    - push
      - Adds an item to the top of the stack
    - pop
      - Removes and returns the item at the top of the stack
    - peek
      - Returns the item at the top of the stack
  - Use of Stacks in Programming
    - Stacks can be used in backtracking
    - Example - Maze
      - Imagine a program that has to find its way through a maze
      - Every time the program comes to an intersection, each possible path that can be taken can be pushed into a stack
      - The path at the top of the stack is traversed
      - If the path leads to a dead end, this path, which is at the top of the stack, can be popped off and the next path can be

traversed

- This process repeats until the program exits the maze

▼ Queues

- First-in-first-out (FIFO)
- Items are added to the tail of the queue
- Items are removed from the head of the queue

▼ Common Queue Operations

▼ is_empty

- Checks whether the queue is empty

▼ size

- Returns the number of items in the queue

▼ enqueue

- Adds an item to the tail of the queue

▼ dequeue

- Removes and returns the item at the head of the queue

▼ qhead

- Returns the item at the head of the queue

▼ qtail

- Returns the item at the tail of the queue