**Stacks and Queues**

**Document Id 21**

**Concepts**

* **Stack models**
* **Queue Models**
* **Stack and Queue based algorithms**

**Section 1 Stack Concepts**

**Learning Objectives**

* **Linked List Model**
* **LIFO FIFO**
* **Stack model**
* **Reverse Polish notation**

**Guided Learning Tasks**

Implement a basic Stack with a Linked List

Perform simple stack algorithm with Reverse Polish notation

Lab 1 Practical Application of a Stack

Lab 1 Solution

**Section 2 Queue Concepts**

<https://en.wikipedia.org/wiki/FIFO_(computing_and_electronics)>

**Learning Objectives**

* **FIFO**
* **Queue model**

**Guided Learning Task**

Implement a basic Queue with a Linked List

Lab 2 Practical Application of a Queue

Lab 2 Solution

**Section 3 Parsing Concepts**

**Learning Objectives**

* Parsing
* Well Formed Expressions
* Abstract Syntax Tree (AST).
* Semantic validation (syntactically correct but not valid code)

**Guided Learning Tasks**

Implement a simple AST parser

Lab 3 Practical Test for Well Formed Expressions

Lab 3 Solution