Assignment 9 Design

UML Diagrams

Int Node

```
┌─────────────────────────┐
│        Int Node         │
├─────────────────────────┤
│ ─ data : Int            │
│ ─ nextNode : * Int Node │
│                         │
├─────────────────────────┤
│ + IntNode()             │
│ + ~ IntNode()           │
│ + IntNode (data : int)  │
│ friend class stack      │
└─────────────────────────┘
```
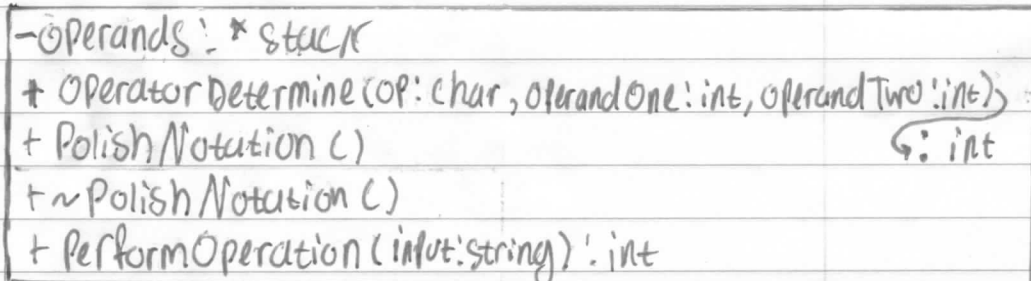
Stack

```
┌───────────────────────────┐
│          Stack            │
├───────────────────────────┤
│ ─ tail : * IntNode        │
│ ─ sizeOfStack : int       │
│                           │
├───────────────────────────┤
│ + Stack()                 │
│ + ~ Stack()               │
│ + Push (value : int): void│
│ + Pop(): int              │
└───────────────────────────┘
```
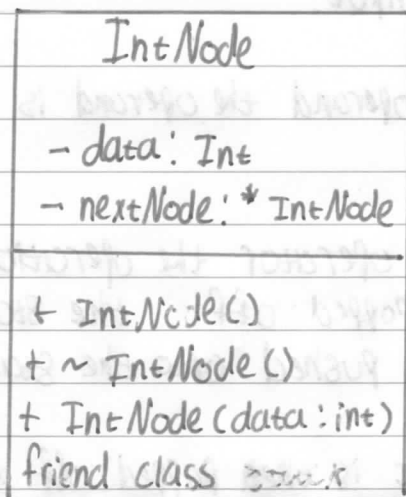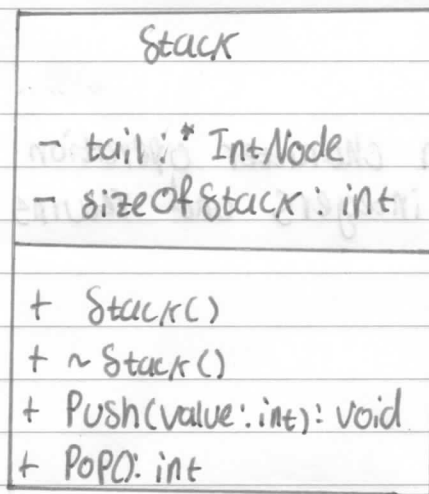
Polish notation

Polish Notation

```
┌──────────────────────────────────────────────────────────────┐
│ ─ operands : * stack                                           │
│ + Operator Determine (op : char, operandOne : int, operand Two : int) │
│ + Polish Notation ()                                  ─ : int  │
│ + ~ Polish Notation ()                                         │
│ + PerformOperation (input : string) : int                      │
└──────────────────────────────────────────────────────────────┘
```

Explanation of Core Functions

- Perform Operation
  → Takes in a pre-checked string input.

  Starts from the end of the input and scans to the beginning of the input.

  If it detects an operand the operand is pushed to the stack.

  If it detects an operator the operation is performed on two values, popped off the stack and the result is then pushed onto the stack.

  The final result is then popped off the stack.

- Operator Determine
  → Performs a given character operation value (*, +, -, /) on two input integers and returns the result of the operation.

Testing

Test the following cases on my program

- empty input

- Input containing no operators or operands, such as text

- Input containing different varietys of valid input, such as

$$* - 5\ 6\ 7$$
$$+ \ 7\ 6$$
$$+ \ 6\ 7$$
$$* \ 7\ 3$$
$$* \ 3\ 7$$
$$/ \ 3\ 7$$
$$/ \ 7\ 3$$
$$- \ 8*67$$

And more complex operations such as,

$$- \ * \ / \ 15 - 7 + 1 \ 1 \ 3 + 2 + 11$$

-Input with incorrect number of operators.

-Input with incorrect number of operands.