

# CSE 2216 : DSA 1 Lab Assignment

Fall 2024

June 10, 2025

## Problem 1: Evaluate Postfix Expression Using Stack

### Problem Description:

Given a postfix expression, evaluate its value using a stack. The expression consists of integers and the operators  $+$ ,  $-$ ,  $*$ ,  $/$ .

#### Input:

- A string `expr` representing a postfix expression.

#### Output:

- The evaluated result of the postfix expression.

#### Example:

- Input: `expr = "5 1 2 + 4 * + 3 -"`
- Output: 14

## Problem 2: Reverse First k Elements of a Queue

### Problem Description:

Given a queue, reverse the first  $k$  elements while keeping the order of the remaining elements unchanged.

#### Input:

- An integer  $k$ .
- A queue of integers.

**Output:**

- The modified queue after reversing the first  $k$  elements.

**Example:**

- Input:  $k = 3$ , Queue = [1, 2, 3, 4, 5]
- Output: [3, 2, 1, 4, 5]

## Problem 3: Shortest Path in an Unweighted Graph Using BFS

**Problem Description:**

Given an unweighted graph represented as a list of edges, find the shortest path from a given source vertex to all other vertices using Breadth-First Search (BFS).

**Input:**

- An integer  $V$  (number of vertices).
- An integer  $E$  (number of edges).
- A list of edges, where each edge is represented as a pair  $(u, v)$  indicating an undirected edge between vertices  $u$  and  $v$ .
- A starting vertex `start`.

**Output:**

- The shortest distance from the source vertex to every other vertex.

**Example:**

- Input:

```
V = 5, E = 6
edges = {(0, 1), (0, 2), (1, 3), (1, 4), (2, 4), (3, 4)}
start = 0
```

- Output:

```
Distance from 0: [0, 1, 1, 2, 2]
```

# Instructions and Submission Guidelines

## Instructions:

- You need to submit a report (PDF) containing the simulation of the given sample inputs and outputs.

## Submission Guidelines:

- Keep your code file(s) and the PDF file into a folder named <YourID>.
- Zip the folder and submit it.

## Deadline:

- 5th July (Saturday), 11:55 pm.