Data Structure Visualizer

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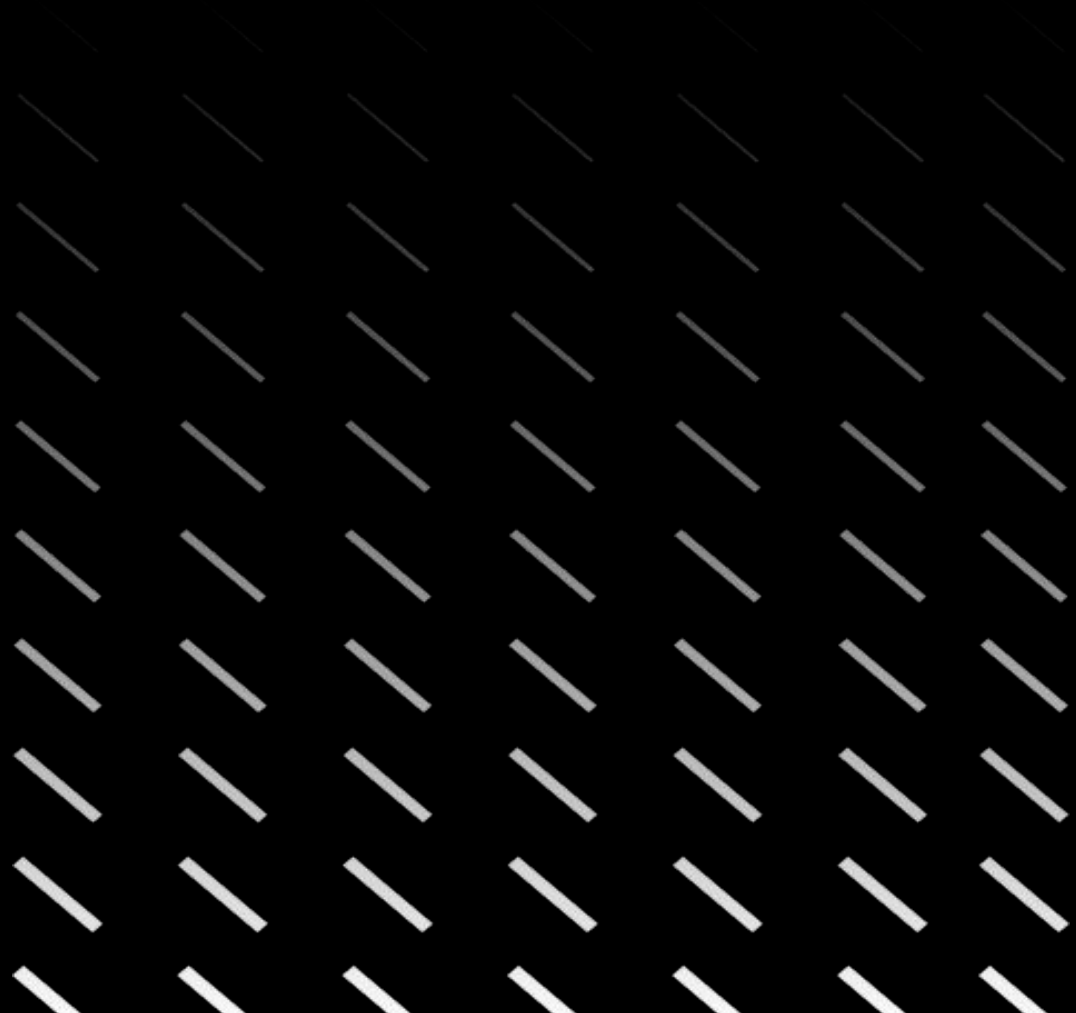
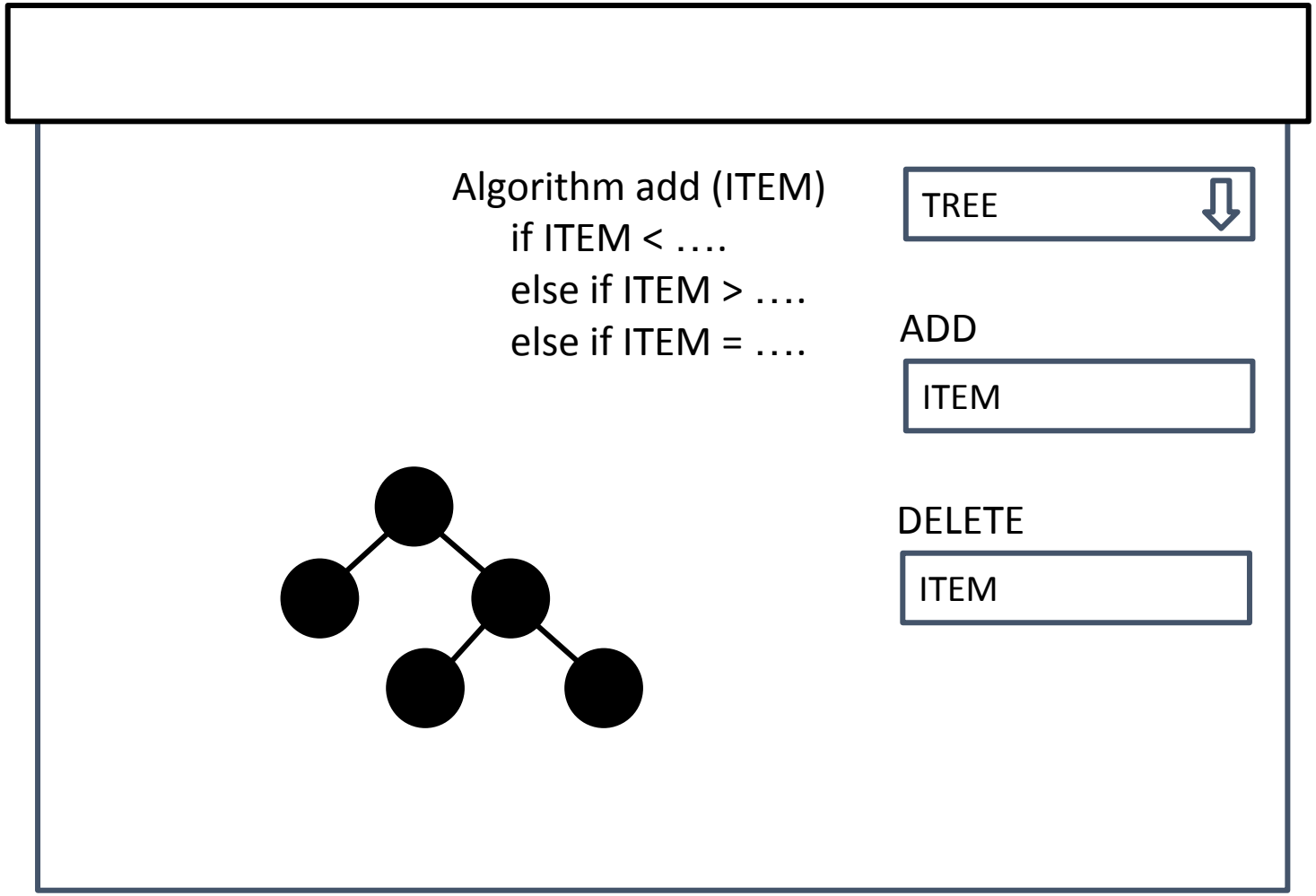
Agenda



- Introduction
- Problem Statement
- Project Overview
- Approach
- Project Demonstration

Introduction

- Java GUI
- Data Structures and Visualization
- Education Purpose

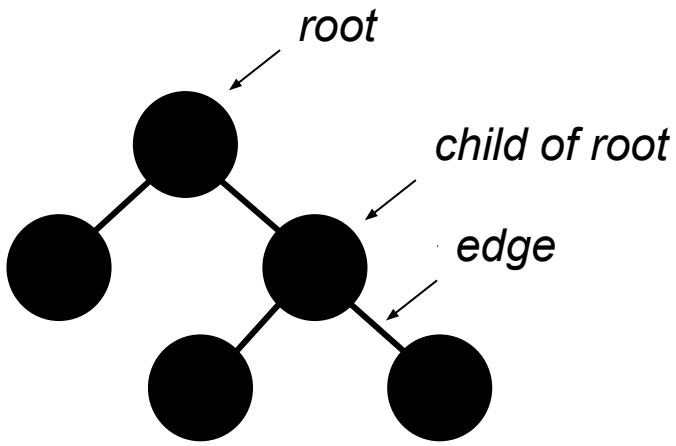


Problem Statement

Pure Text

A tree data structure is a hierarchical structure that is used to represent and organize data in a way that is easy to navigate and search. It is a collection of nodes that are connected by edges and has a hierarchical relationship between the nodes. The topmost node of the tree is called the root, and the nodes below it are called the child nodes. Each node can have multiple child nodes, and these child nodes can also have their own child nodes, forming a recursive structure. (GeeksforGeeks, 2024)

Visualization

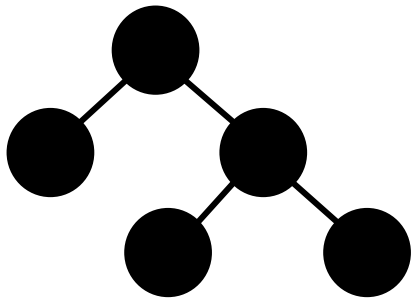


Project Overview

Data Structure + Visualizer = Data Structure Visualizer

Example: Tree

Example



Fix the problem

Approach (1/2)

Data Structure + Visualizer

```
Algorithm  enqueue (Script, Q, Item) {
        Script.add("add new item");
        Script.add("move new item to point 0,0");
        rear = ( front + size ) % Z;
        Q[rear] = Item;
        size += 1;
        Script.add("move new item to rear");
}
```

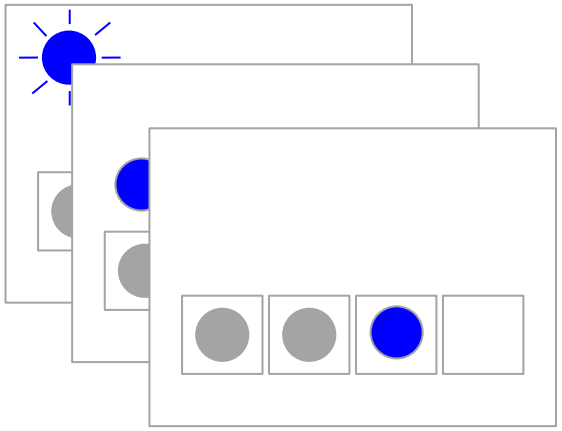
```
Algorithm  enqueue (Script, Q, Item) {
        Script.add("add new item");
        Script.add("move new item to point 0,0");
        rear = ( front + size ) % Z;
        Q[rear] = Item;
        size += 1;
        Script.add("move new item to rear");
}
```

Approach (2/2)

Visualizer

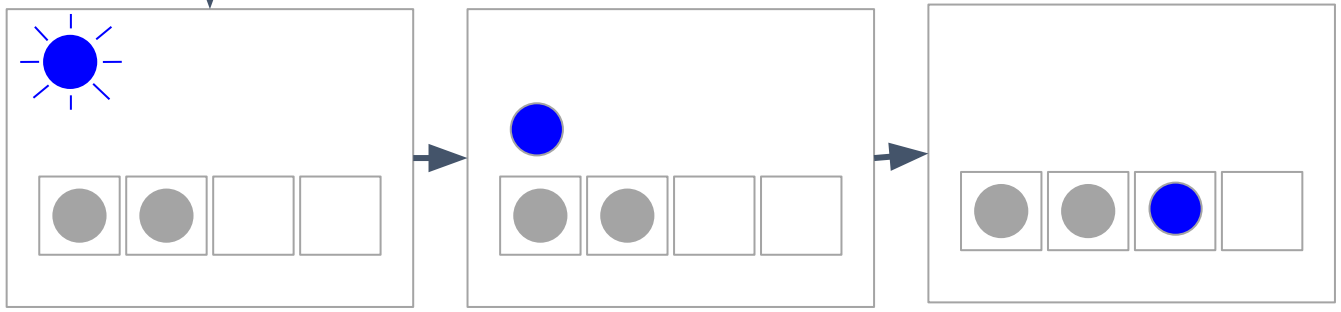
read script

```
Algorithm  enqueue (Script, Q, Item) {
        Script.add("add new item");
        Script.add("move new item to point 0,0");
        rear = ( front + size ) % Z;
        Q[rear] = Item;
        size += 1;
        Script.add("move new item to rear");
}
```

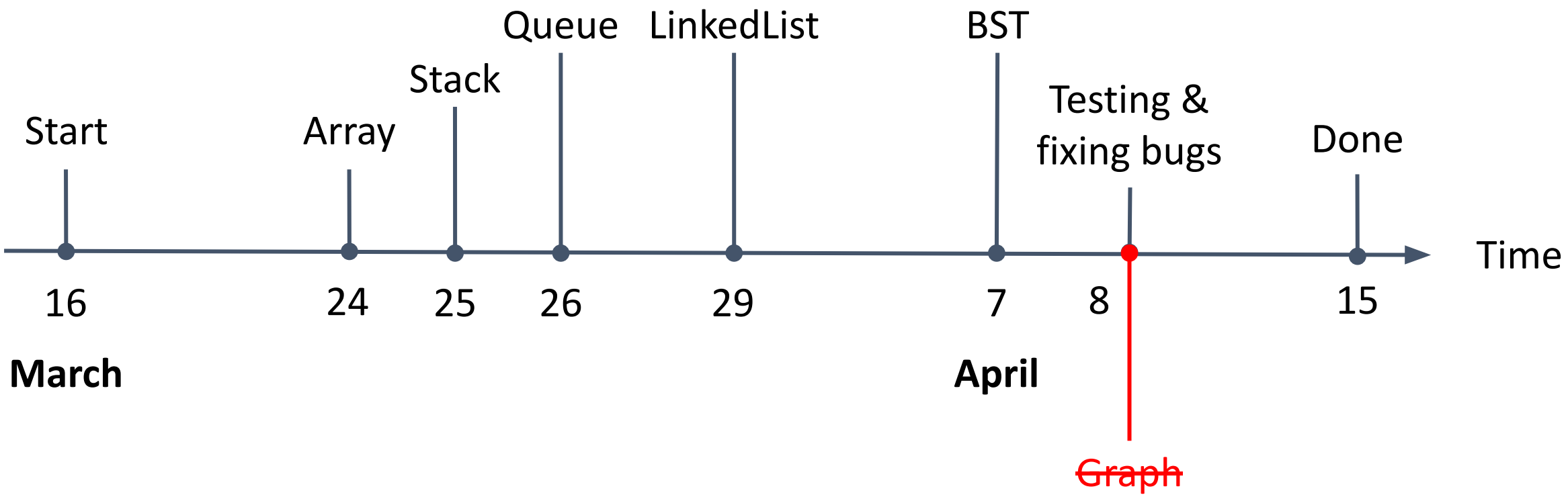


(clips)

run clips



Project Progress



Project Demonstration

- Layout
- Features
  - Responsive UI
  - Real Time Code Hint
  - Real Time Prompt Window
  - Speed Control
- Quick Demo
  - Array
  - Stack
  - Tree

References

Data Structure

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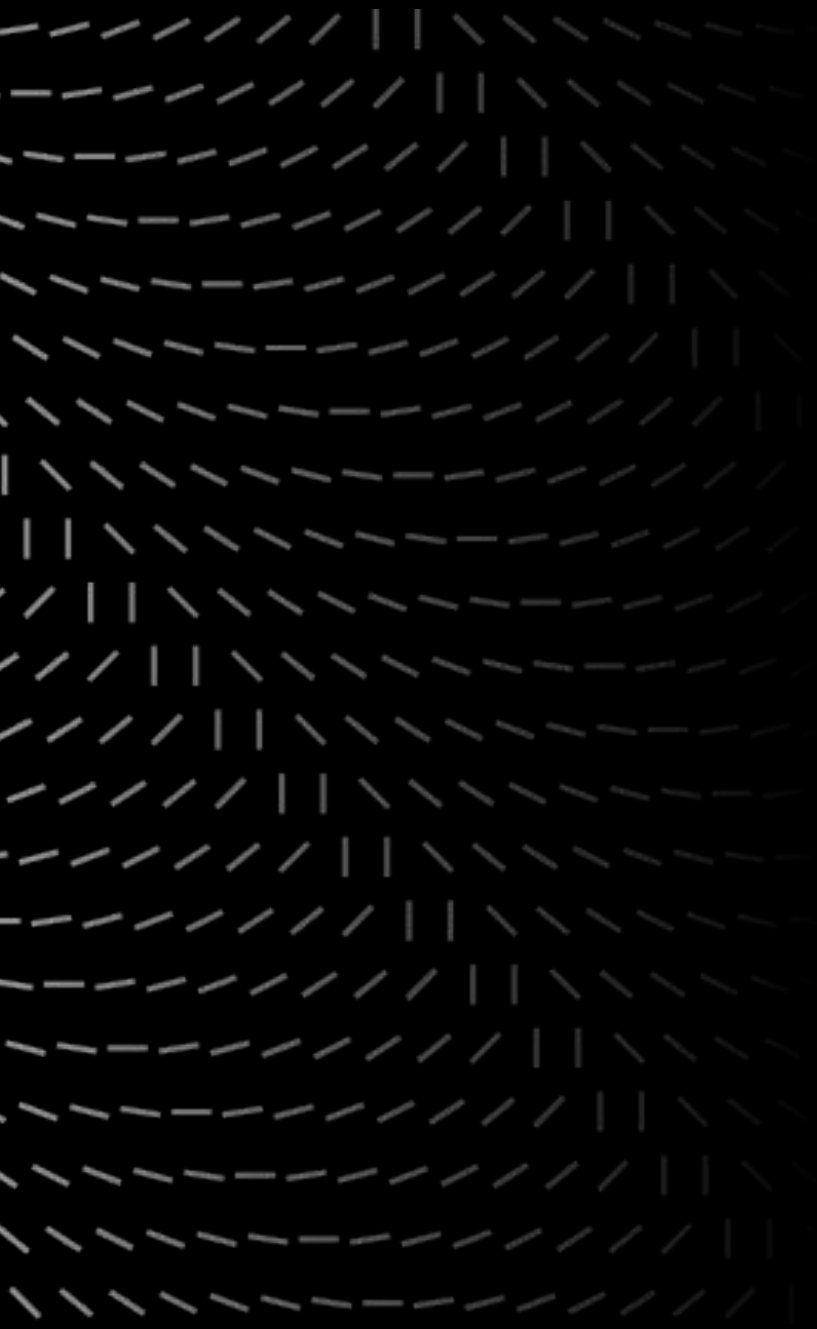
PowerPoint

- Canva @canvacreativestudio



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