System Architecture and Design

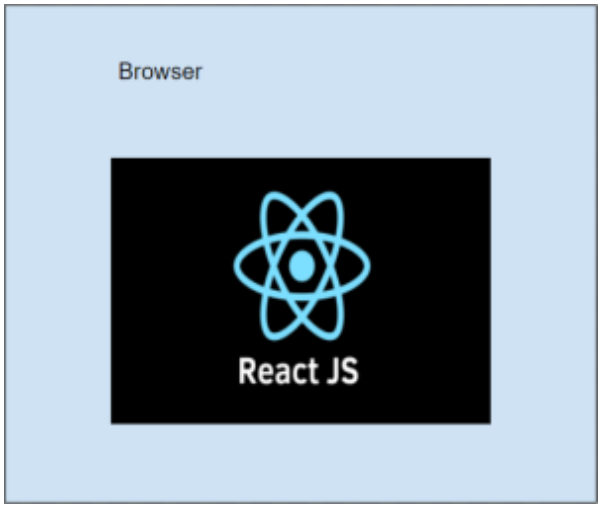
This document outlines the design diagrams created for the AIA Web App.

Table of Contents

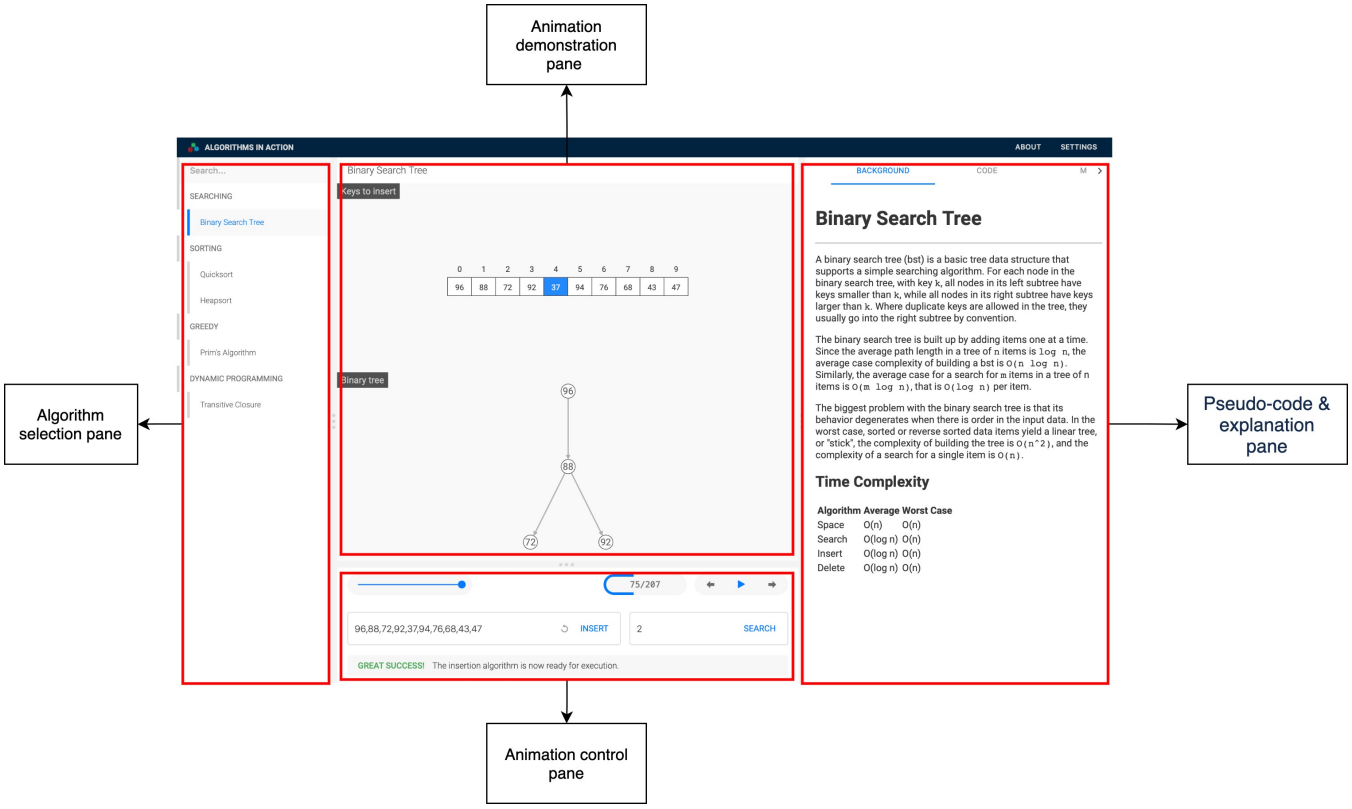
As the AIA web app was previously developed from scratch and the current project focuses on improvisation of the app, we have not created any additional design diagrams such as ER diagram, Sequence diagram, Class diagram etc. Therefore, the teams have focused on providing a high level understanding of the general architecture of the app as well as the flow of activities in it.

High Level Architecture

The application is formed solely by React.js. The application is loaded in the browser and no server or databases are used. This allows for easy maintenance, lower cost, and portability, as well as a quicker rendering for the user.



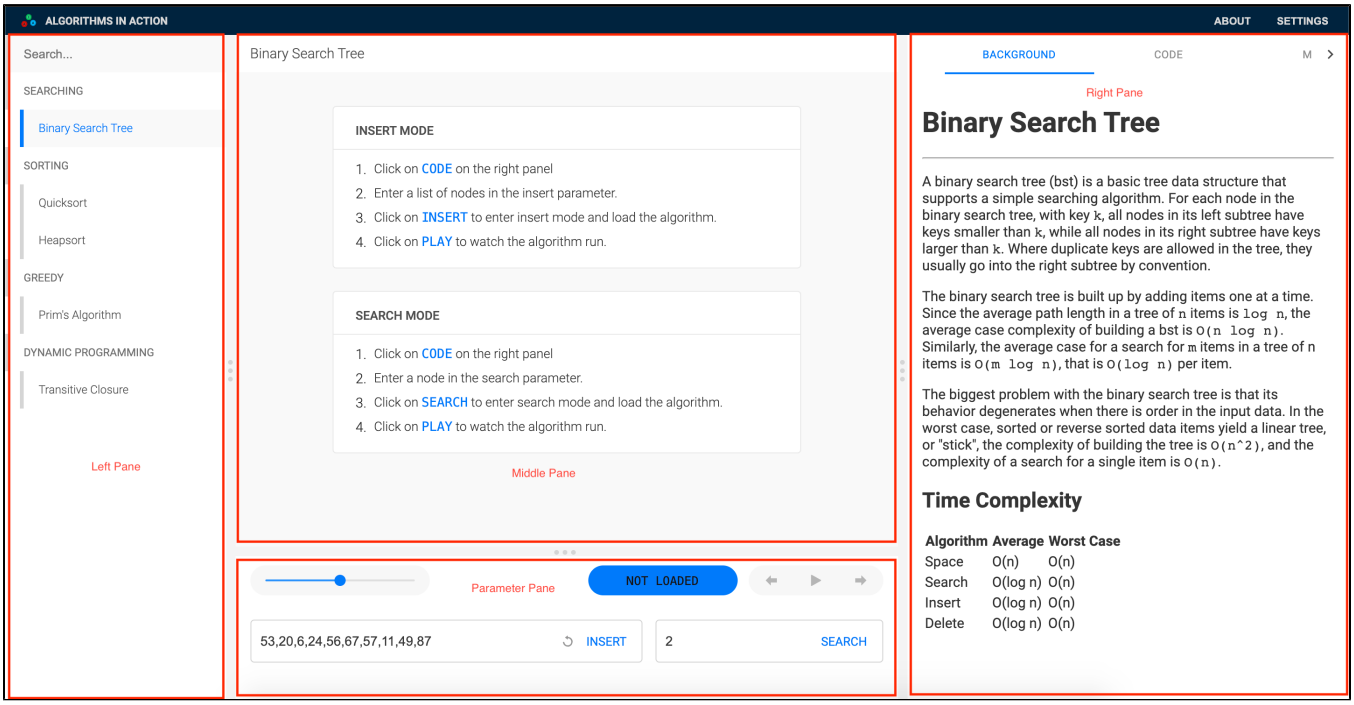
Below is a graphic displaying the various components of the front-end interface which have been explained in detail in the Component Design document -



Component Design

Overview of the System

The system consists of 4 components, namely - Top Pane, Left Pane, Middle Pane and Right Pane. Each of the component has been highlighted below as well as explained in detail.



1. The Top Pane

The AIA web app consists of a top pane which displays the About page and Settings tab for the app. The Settings tab provides 3 options - font size, color theme for the algorithms and system theme.

The code base for this component is located at *src/components/top*

2. The Left Pane

In the AIA system, we have a left pane showing the various algorithms available on the platform. Users are able to select their desired algorithm. Once selected, the middle, parameter, right panes will update accordingly.

The corresponding code base can be found in *src/components/left-panel*

3. The Middle Pane

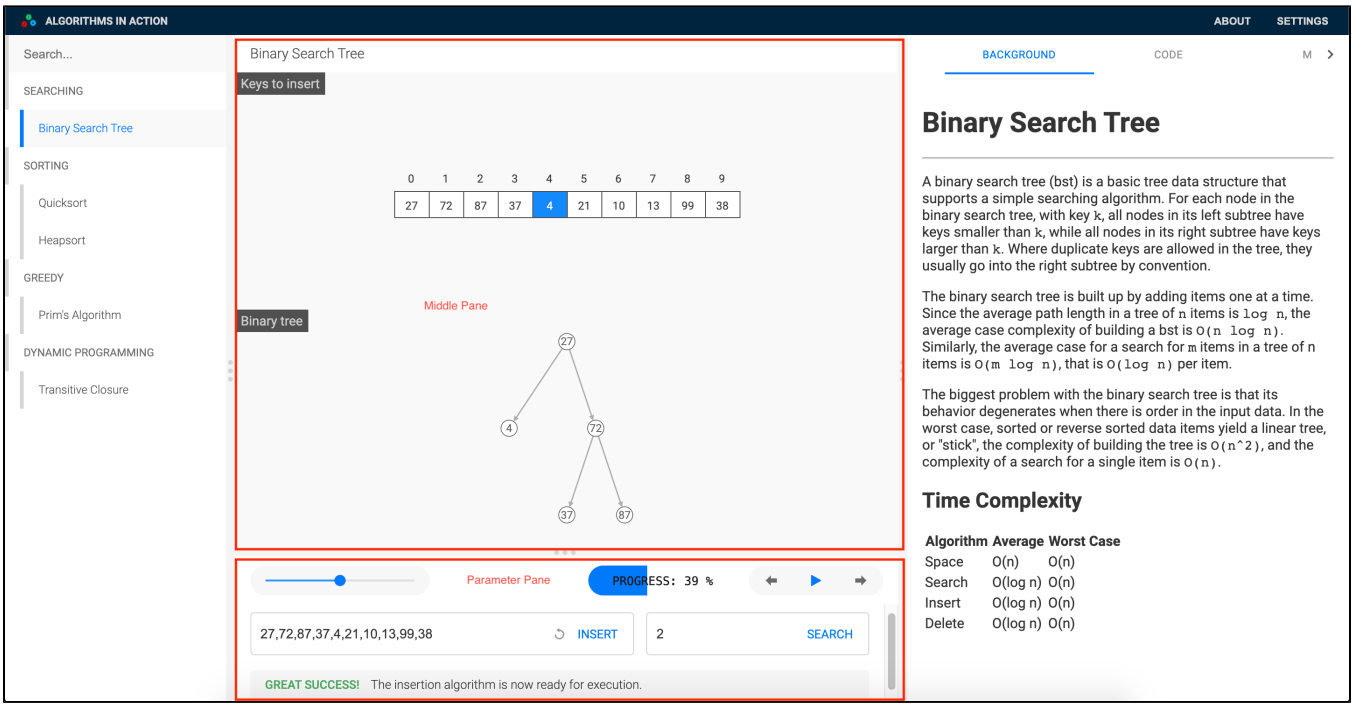
The middle pane initially shows the instructions to get started with the algorithm selected. Once, the user has configured and loaded their input, it will be visually represented in the middle pane. When the algorithm is played, all the updates will be reflected in the middle pane.

The code base for this component is present in *src/components/mid-panel*

3.1 The Parameter Pane

Users can update their desired inputs for the selected algorithm and configure different settings in this area of the system. We are able to play/pause the demonstration of the algorithm, configure the speed and skip forward/backward to previous steps in the demonstration.

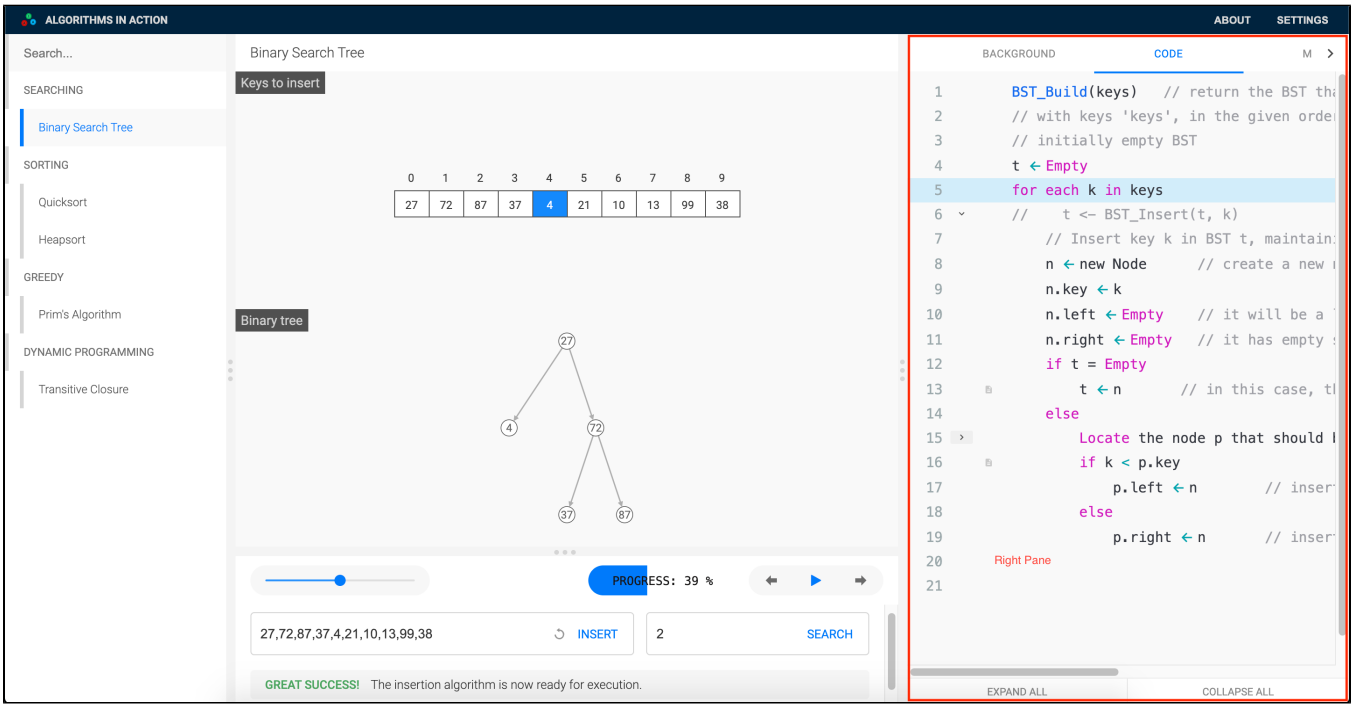
This component is part of middle pane and can be found at the same location.



4. The Right Pane

The right pane has multiple tabs explaining the algorithm. It includes a conceptual overview of the algorithm and pseudo-code. The user can choose to expand or collapse code blocks using the arrows next to the line numbers or use the buttons at the bottom of the right pane to expand/collapse all.

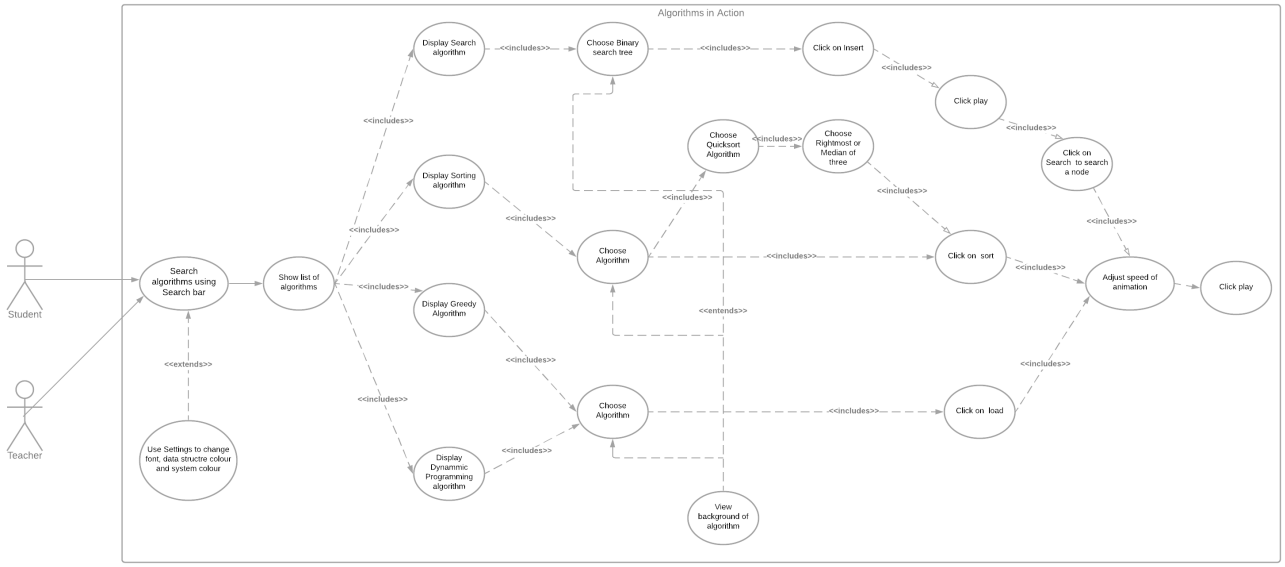
The corresponding code base can be found in *src/components/right-panel*



Use Case Diagram

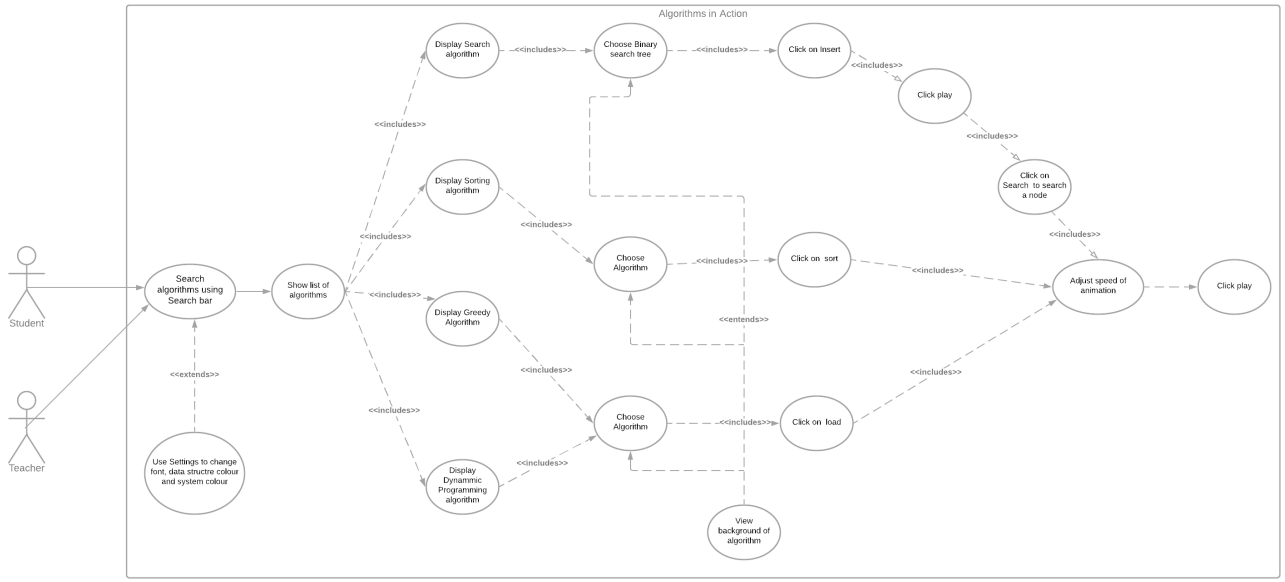
Version 2.0

This version of the diagram has been designed to display the improvements made to the AIA web app during Sprint 1. It reflects the current application.



Version 1.0

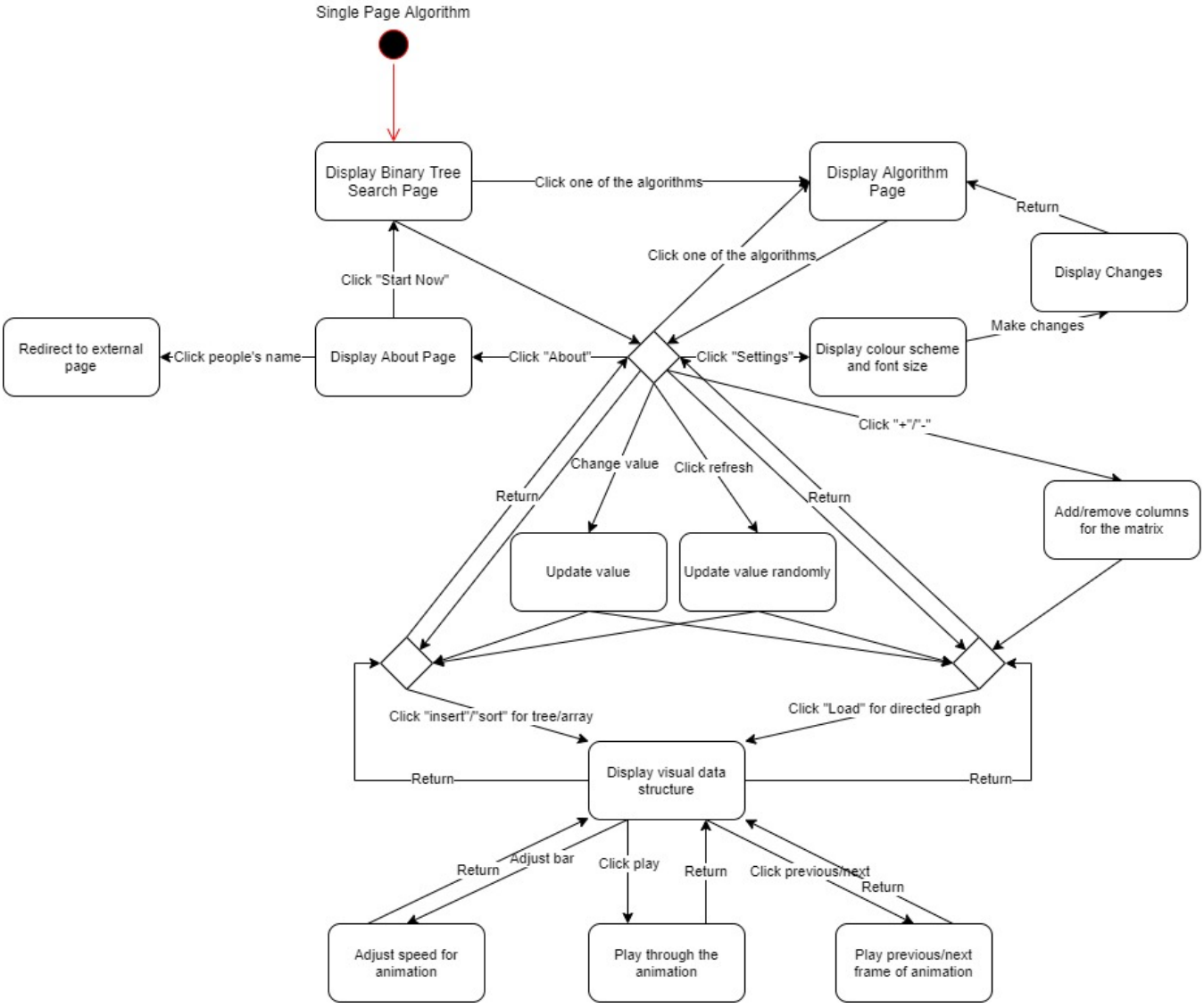
This version of the diagram is the initial diagram that was designed before any improvements were made to the AIA web app. It reflects the previous application.



State Diagram

Transitions

This diagram represents the different states of front-end transitions. The application uses React and hence maintains and updates all changes on a single view of entity.



Activity Diagram

The activity diagram below represents the activity flow of the student user for the AIA web app.