

SORTING VISUALIZER

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Merge Sort



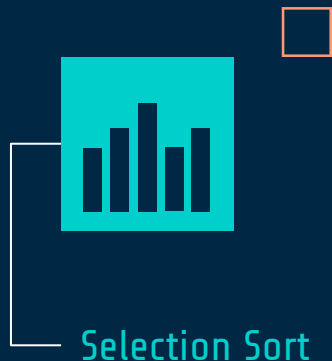
Nguyen Van Thanh
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Shell Sort



Nguyen Vu Thien
Trang 20194459
Selection Sort



PROBLEM STATEMENT



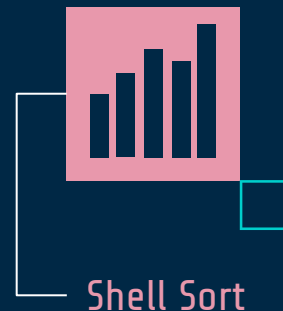
PROBLEM

Explaining and visualizing different sorting algorithms



Design

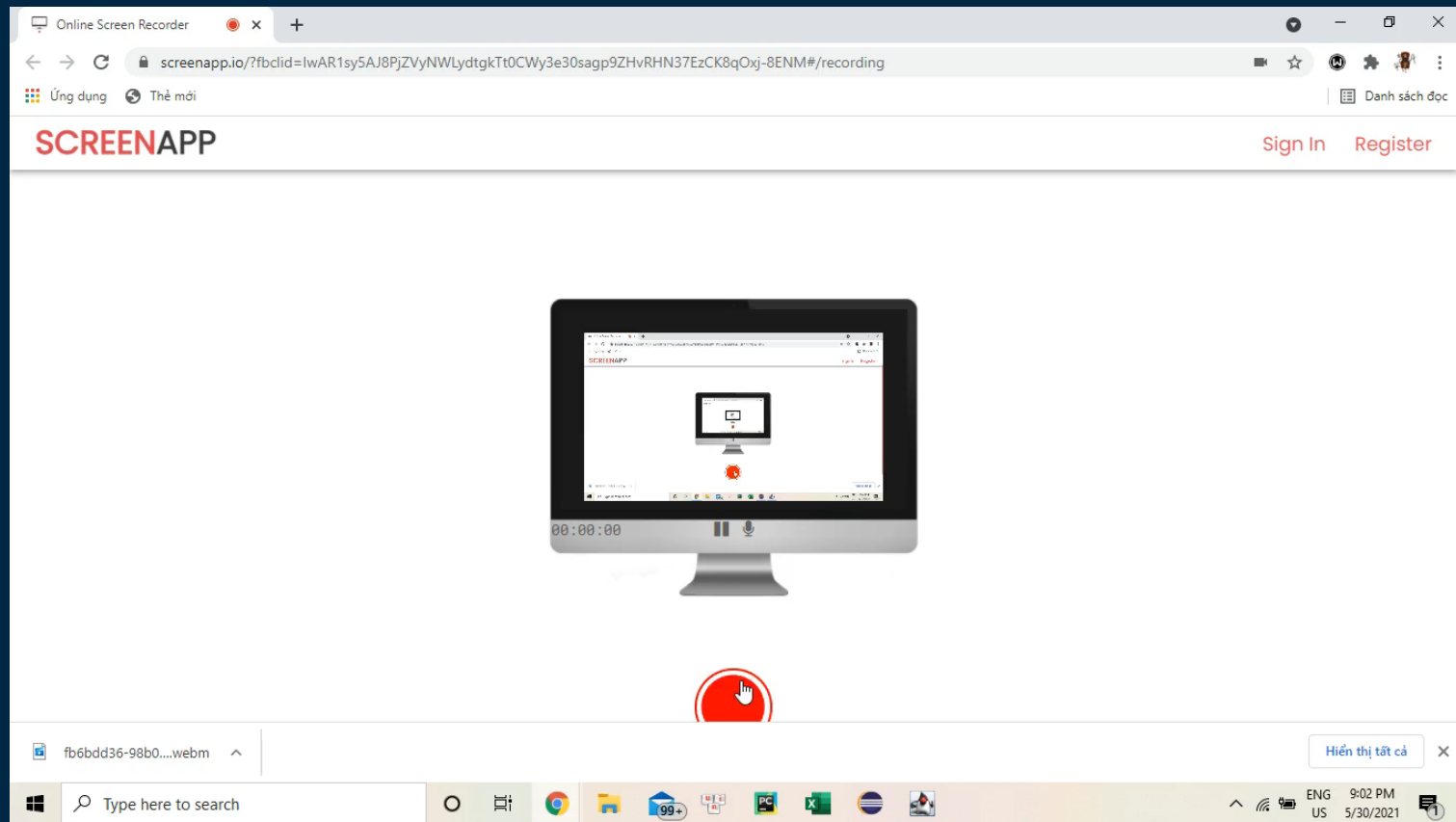
Design an UI for the problem with different features



TARGET

Help users have a better insight about how algorithms work

DEMO VIDEO



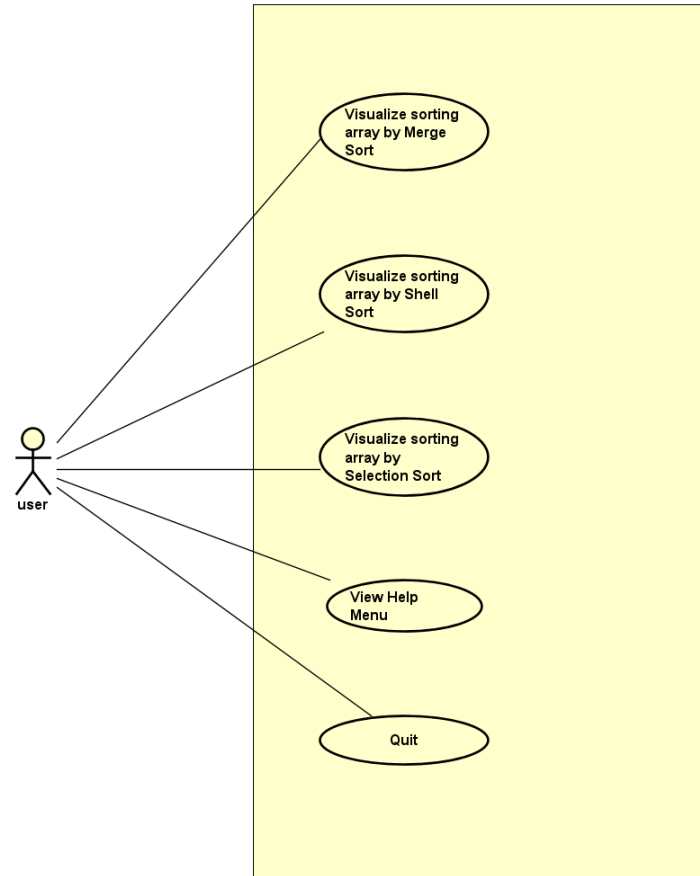
USE CASE DIAGRAM

Users can start visualizing by select a sort type

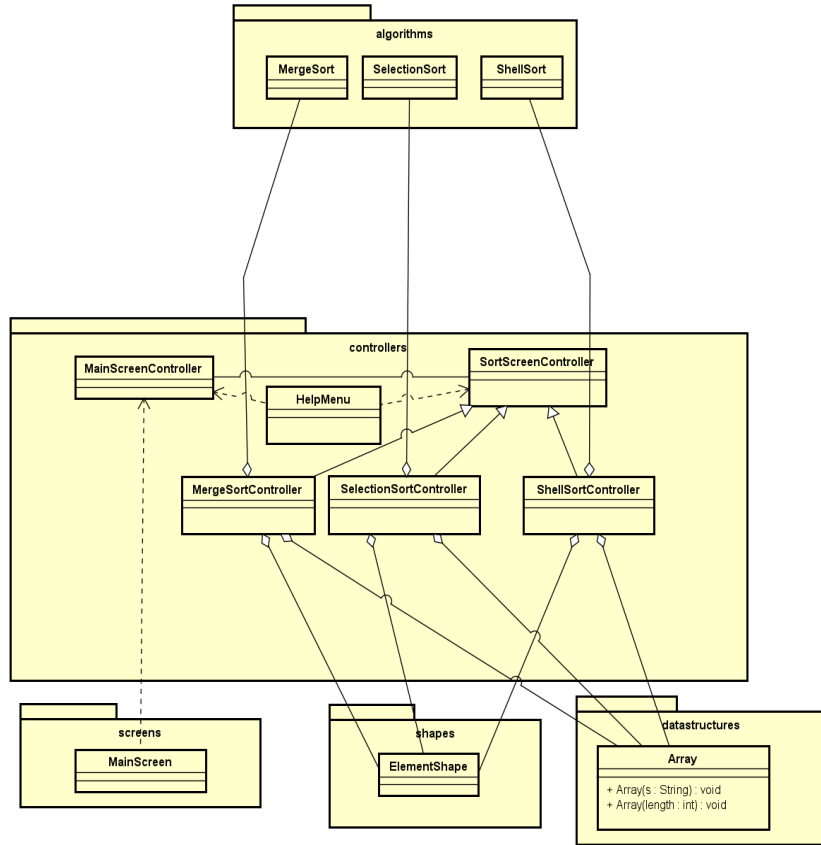
- Take all user command from the GUI
- Notice the user if there is anything wrong with his input
- Run the designated algorithm
- Run/Reset the visualization based on user command.

Users can view the help menu

Users can quit the program



CLASS DIAGRAM



Package datastructures: store the main data structure (customized array).

Package algorithms: store 3 sorting algorithms for visualizing.

Package controllers: store all the screen controllers.

Package main screen: store the main screen class of the application.

Package shapes: store the class `ElementShape` which is used for visualization in the GUI.

Array & Shape

Array

Two constructors for customizing and randomizing a new array
Clone method for cloning an array
A getter for array's length
Handle user input exception

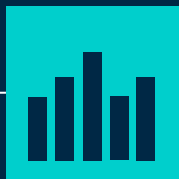


Shape

3 main constructor represents 3 different shape types used for different purpose of visualization.
There are two types of TranslateTransition.



PACKAGE ALGORITHMS



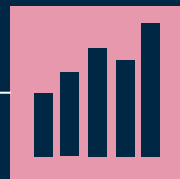
SelectionSort

Sort an original array of integers and an customized array of shapes
Getters for transitions, shapes state at each steps



MergeSort

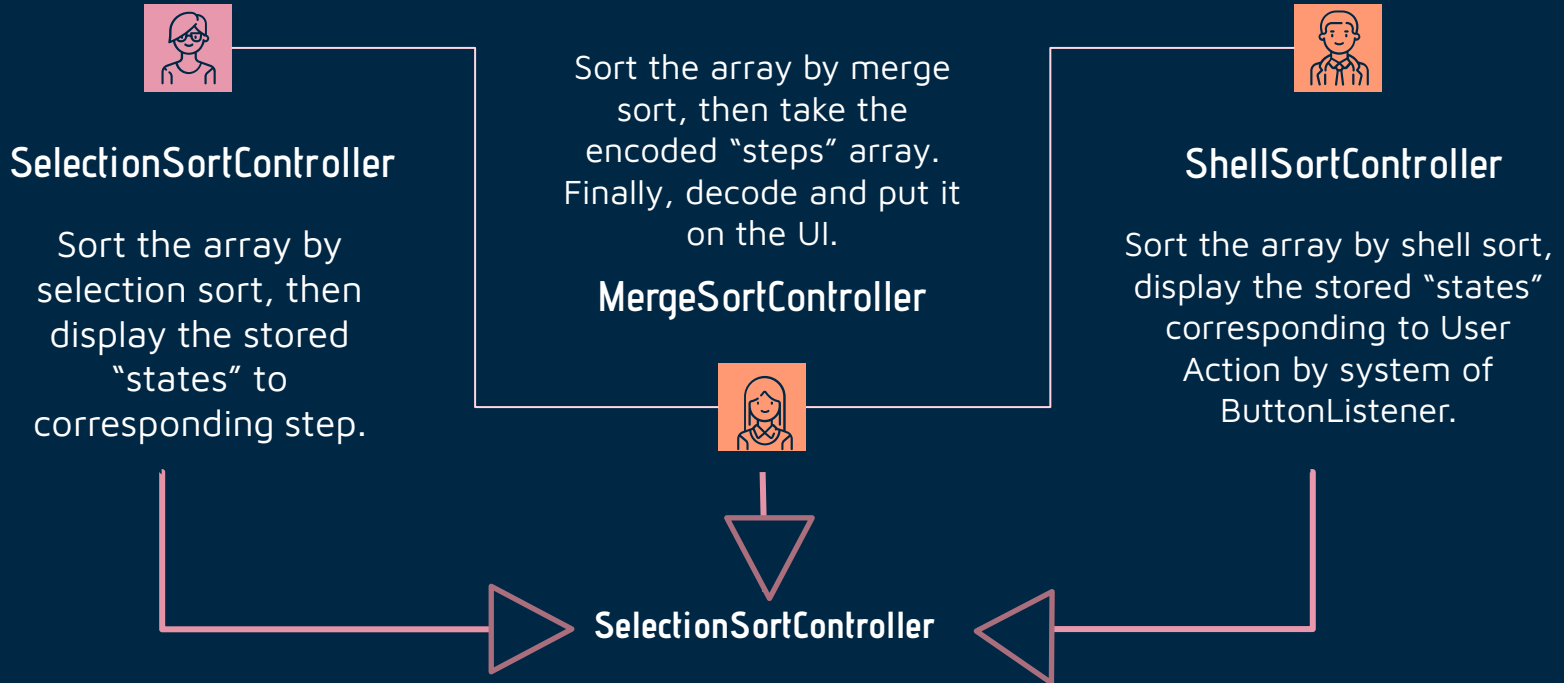
Sort an original array, then encode the sorting process, and corresponding UI effect into an array, called steps



ShellSort

Sort an original array of integers, store necessary data for the process. Provide Getters for transitions, state of array at each steps.

PACKAGE CONTROLLERS



A pixel art illustration of a city skyline at sunset. The sky is a gradient of orange, pink, and purple, with three large, bright suns visible on the horizon. The city is composed of various buildings of different heights and colors, including shades of purple, blue, and green. Some buildings have small windows with yellow lights. The overall style is reminiscent of 8-bit or 16-bit video game graphics.

THANKS FOR YOUR ATTENDING !