



Presented by Group 23

SORTING ALGORITHMS GUI



MEMBERS



LE DUC ANH TUAN



DAO VAN TUNG



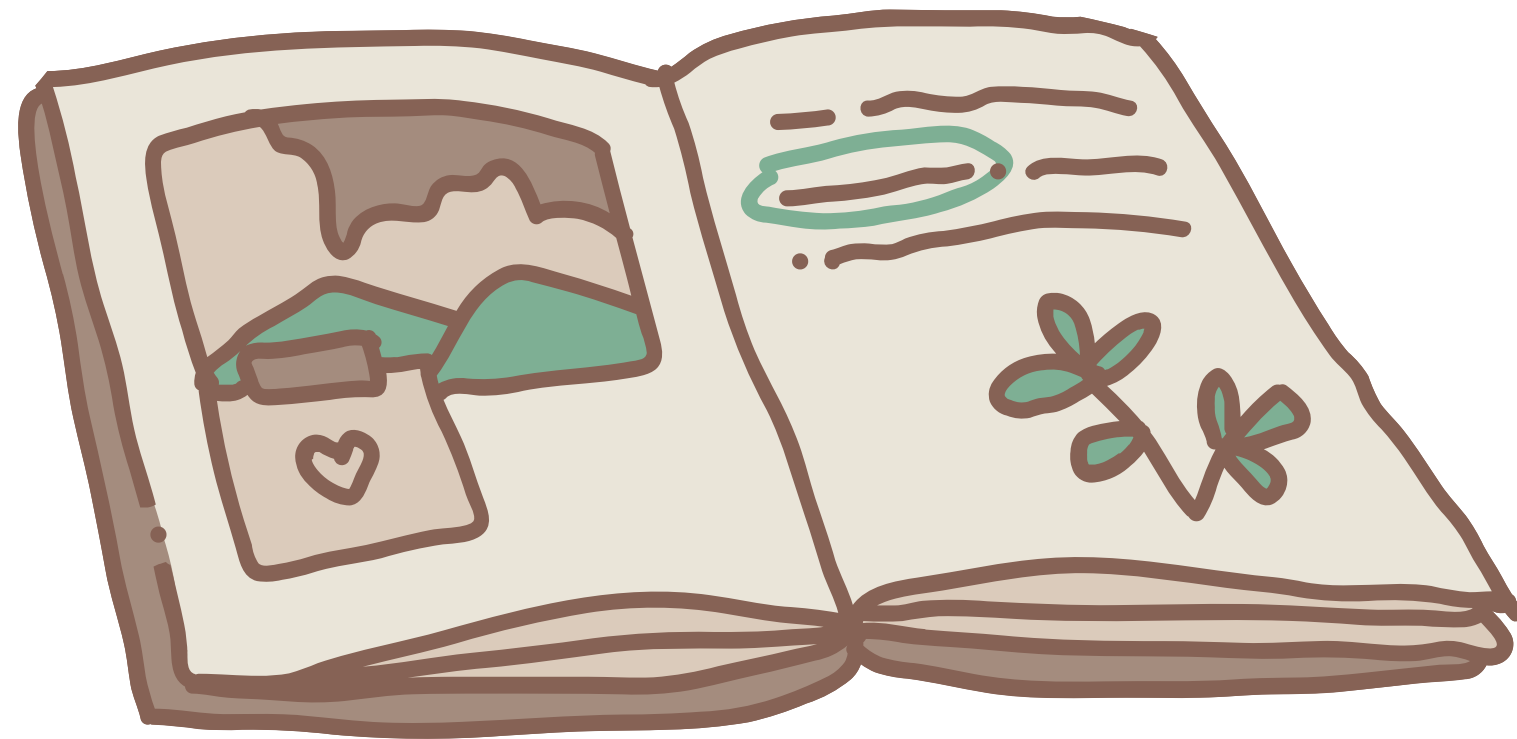
BUI THANH TUNG



NGUYEN ANH TUAN



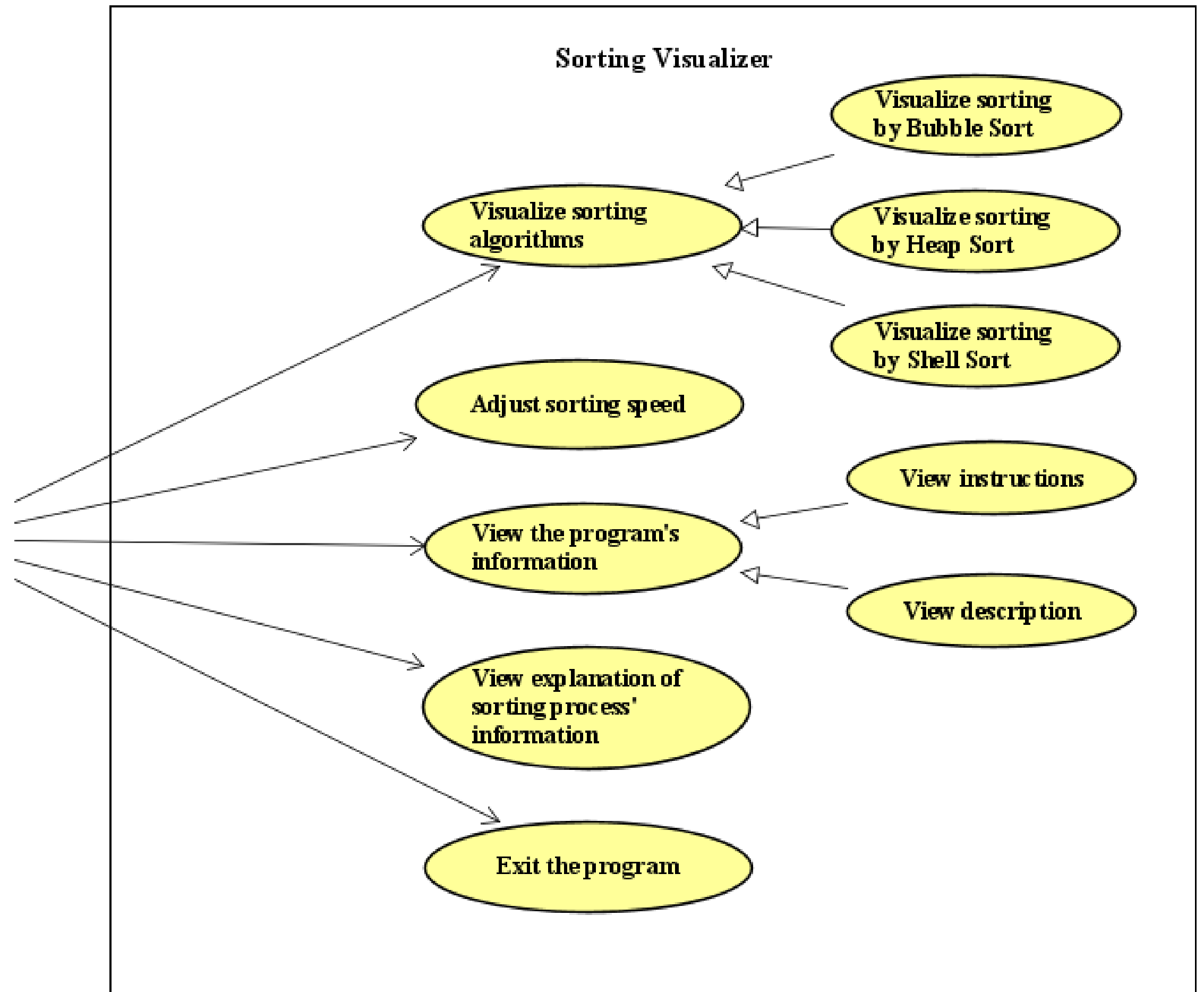
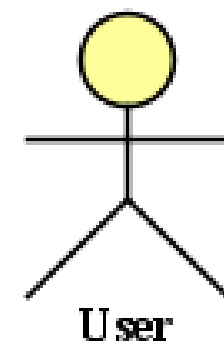
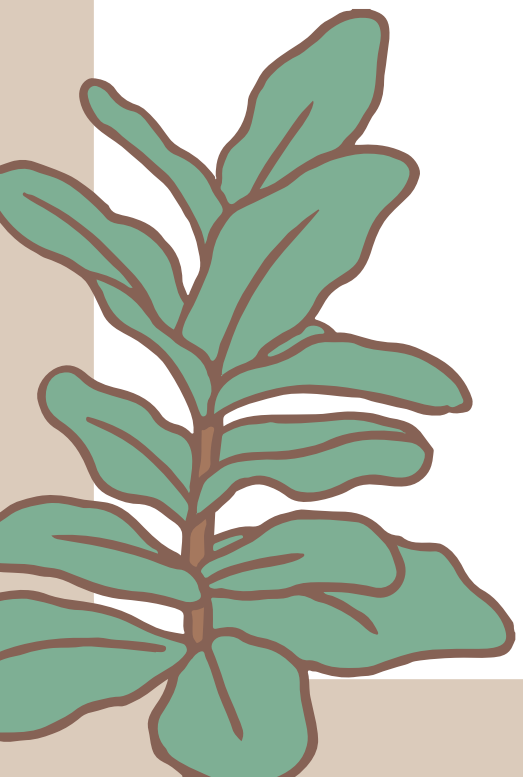
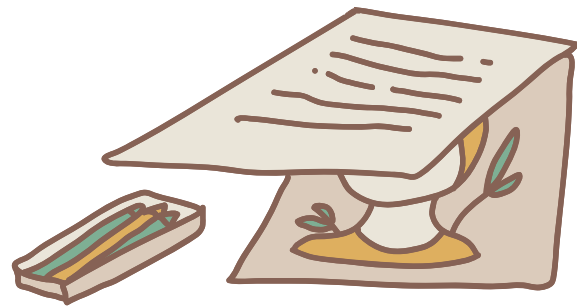
Problem statement



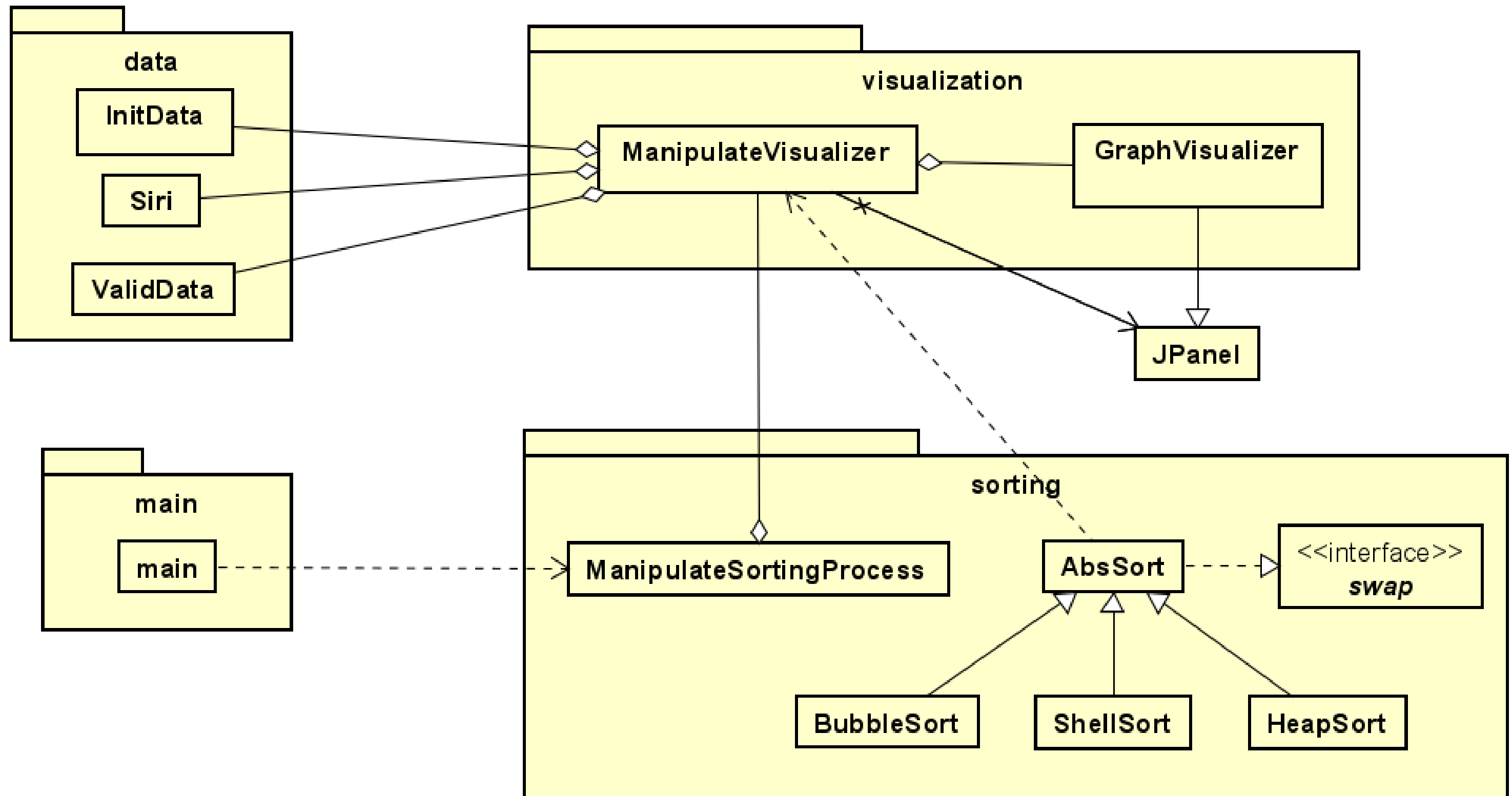
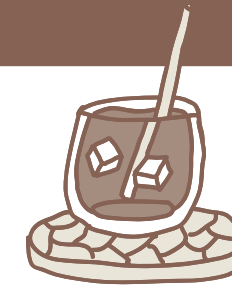
Array is the most basic structure of computer science. Most operations as well as other data structures are built and performed on an array.

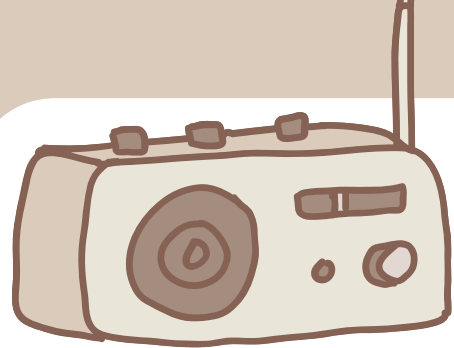
In this project, we make an application GUI to explain three sorting algorithms on an array: bubble sort, heap sort, shell sort.

Use case diagram

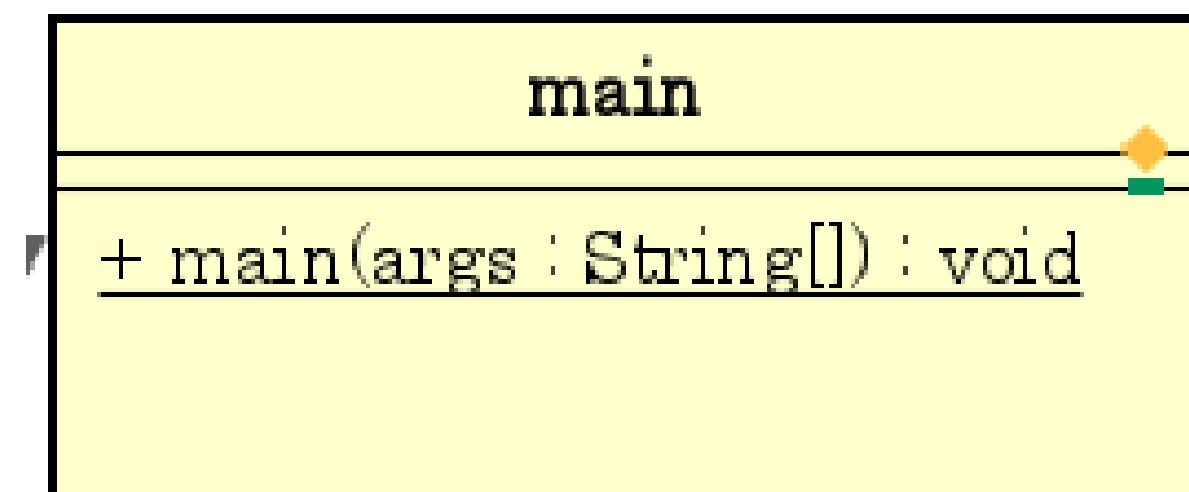


General class diagram

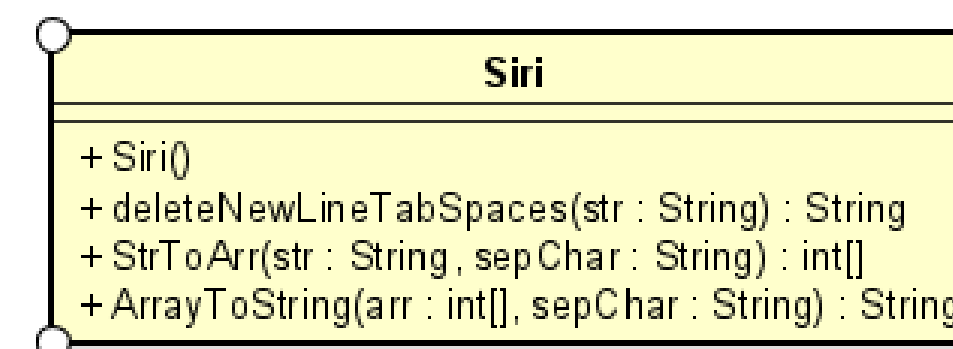
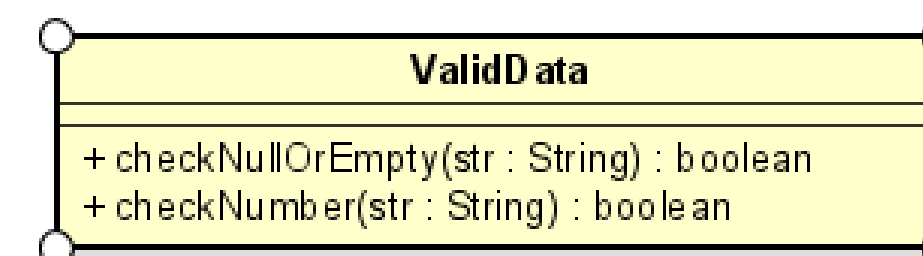
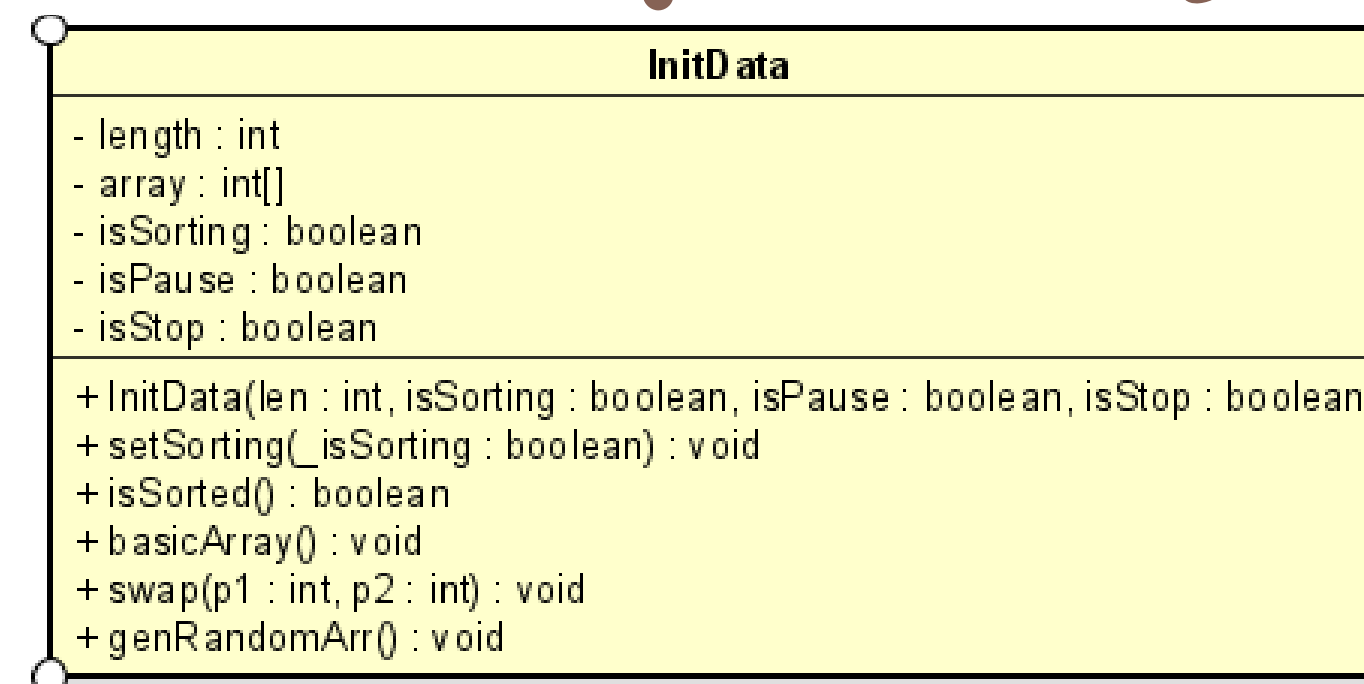




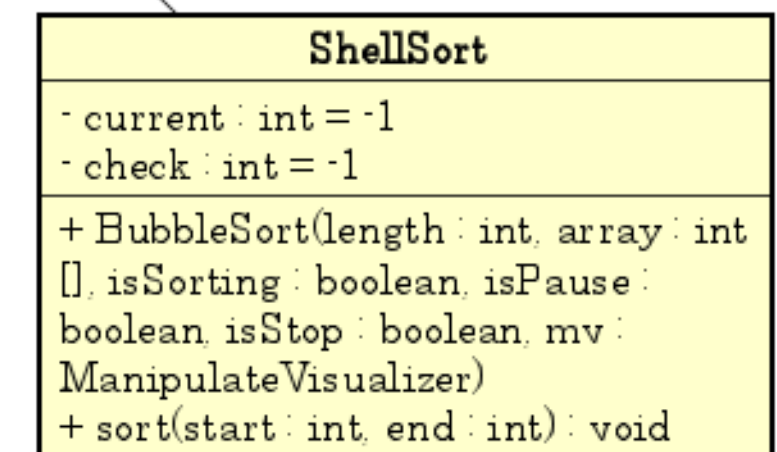
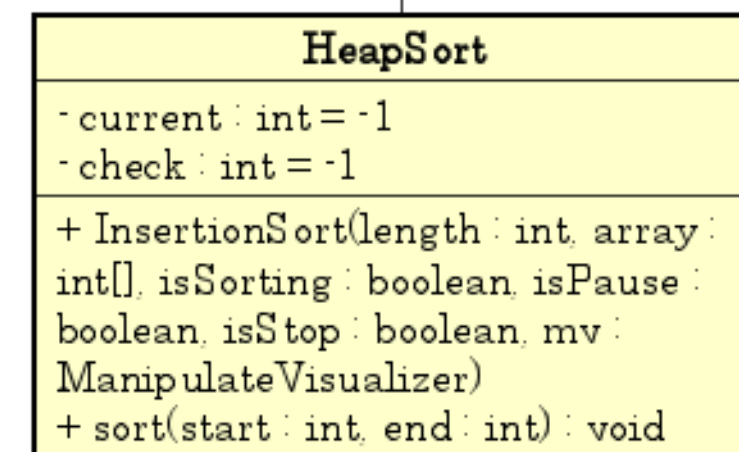
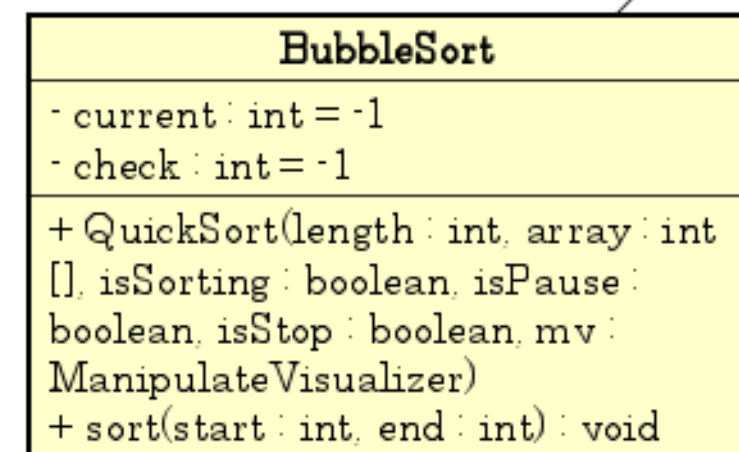
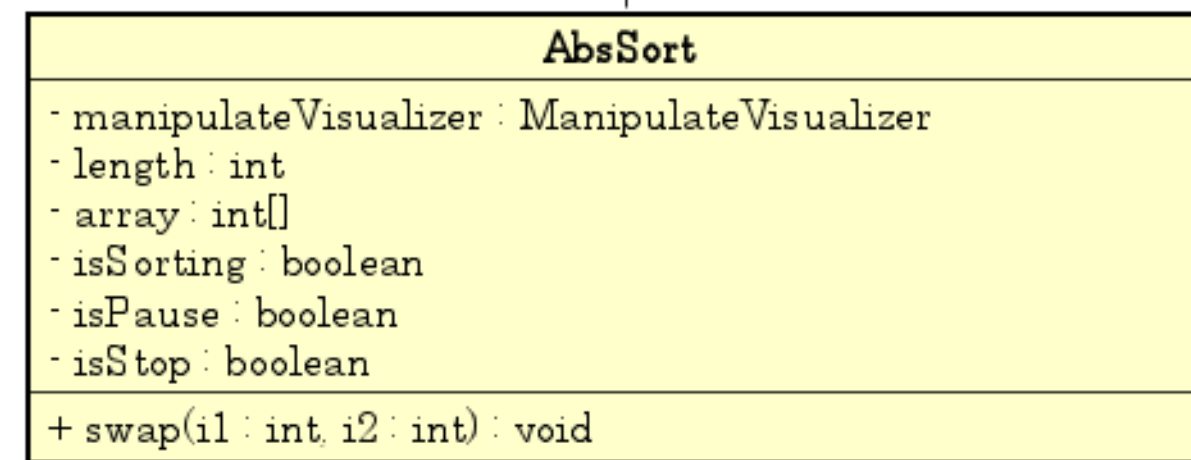
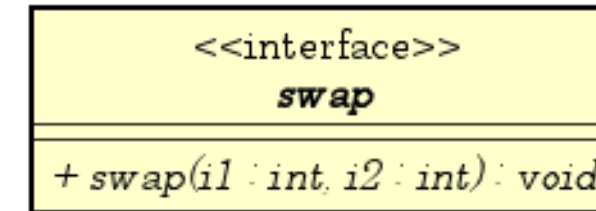
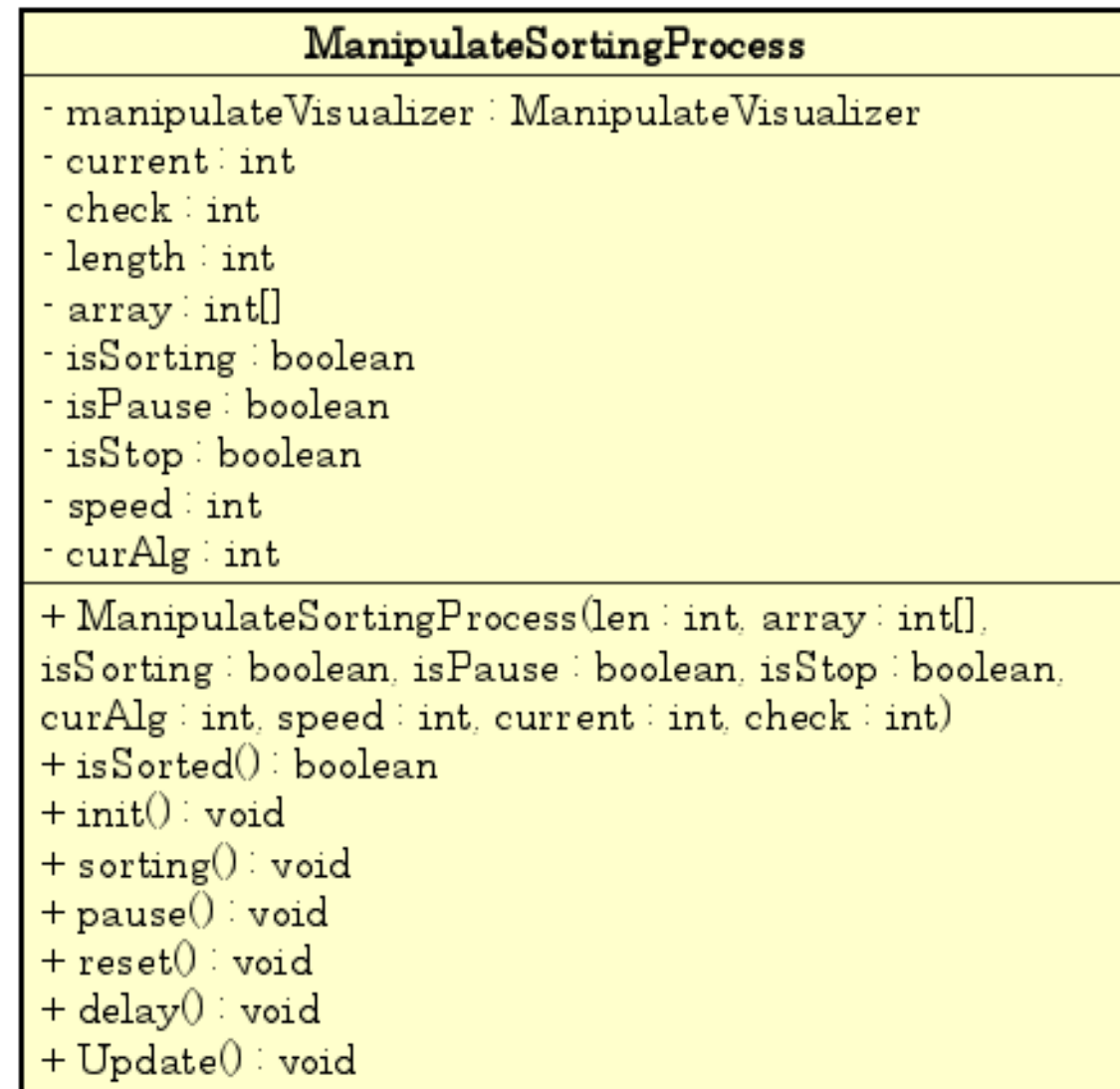
Main package



Data package



Sorting package



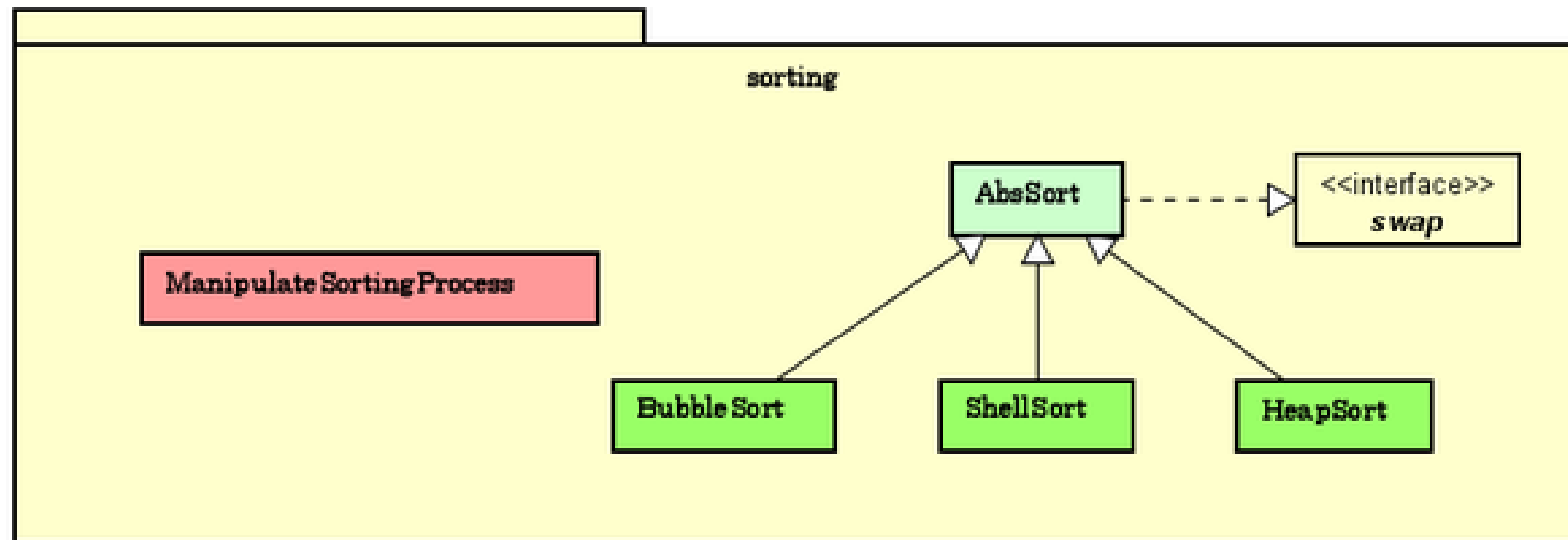
Visualization



ManipulateVisualizer
<div><div>- validator : ValidData</div><div>- helpers : Siri</div><div>- canvas : GraphVisualizer</div><div>- r : Random</div><div>- current : int</div><div>- check : int</div><div>- length : int</div><div>- array : int[]</div><div>- isSorting : boolean</div><div>- isPause : boolean</div><div>- isStop : boolean</div><div>- speed : int = 50</div><div>- compared, arrayAccessed, curInputDataOption, curAlg : int = 0</div><div>- sortingProcessListMsg : String[] = { "Bubble sort", "Heap sort", "Shell sort" }</div><div>- sortingProcessMsg : String = sortingProcessListMsg[curAlg]</div><div>- ABOUT_MESSAGE : String = "Sorting V...</div><div>- HELP_INSTRUCTION_MESSAGE : String = "Here is t...</div><div>- MAX_ARRAY_LENGTH : int = 300</div><div>- displayTextArea : String = "[\n \n]"</div><div>- GRAPH_SIZE : int = 600</div><div>- rectangle_width : int</div><div>- genDataOptions, helpGenDataMsg, algorithmOptions, algorithmListInfo : String[]</div><div>- jframe : JFrame</div><div>- genDataPane, controlsPane : JPanel</div><div>- delayLabel, speedLabel, comparedLabel, arrayAccessedLabel, genDataOptionLabel, arrayLengthLabel, arrayLengthErrorLabel, algorithmOptionLabel, algorithmInfoLabel, sortingProcessLabel : JLabel</div><div>- genDataOptionComboBox, algorithmComboBox : JComboBox</div><div>- inputArrayArea, algorithmInfoArea : JTextArea</div><div>- inputArrayScrollPane : JScrollPane</div><div>- btnGenerateArray, btnHelpGenerateArray, btnStartSort, btnPauseSort, btnStopSort, btnResumeSort, btnHelpComparison, btnHelpAccess, btnHelpInstructions, btnAbout : JButton</div><div>- arrayLengthInput : JTextField</div><div>- speedSlider : JSlider</div><div>- loweredEtched : Border</div></div> <div><div>+ ManipulateVisualizer(length : int, array : int[], isSorting : boolean, isPause : boolean, isStop : boolean, cur : int, check : int)</div><div>+ initialize() : void</div><div>+ updateWhenSortDone() : void</div><div>+ updateProcess(length : int, array : int[], current : int, check : int) : void</div><div>+ updateArrayAccessed(i : int) : void</div><div>+ delay() : void</div></div>

GraphVisualizer
<div><div>- rectangle_width : int</div><div>- length : int</div><div>- array : int[]</div><div>- current : int</div><div>- check : int</div></div> <div><div>+ getCurrent() : int</div><div>+ setCurrent(current : int) : void</div><div>+ getCheck() : int</div><div>+ setCheck(check : int) : void</div><div>+ getArray() : int[]</div><div>+ setArray(array : int[]) : void</div><div>+ getRectangle_width() : int</div><div>+ setRectangle_width(rectangle_width : int) : void</div><div>+ getLength() : int</div><div>+ setLength(length : int) : void</div><div>+ GraphVisualizer(recWid : int, length : int, ar : int[], cur : int, check : int)</div><div>+ paintComponent(g : Graphics) : void</div></div>

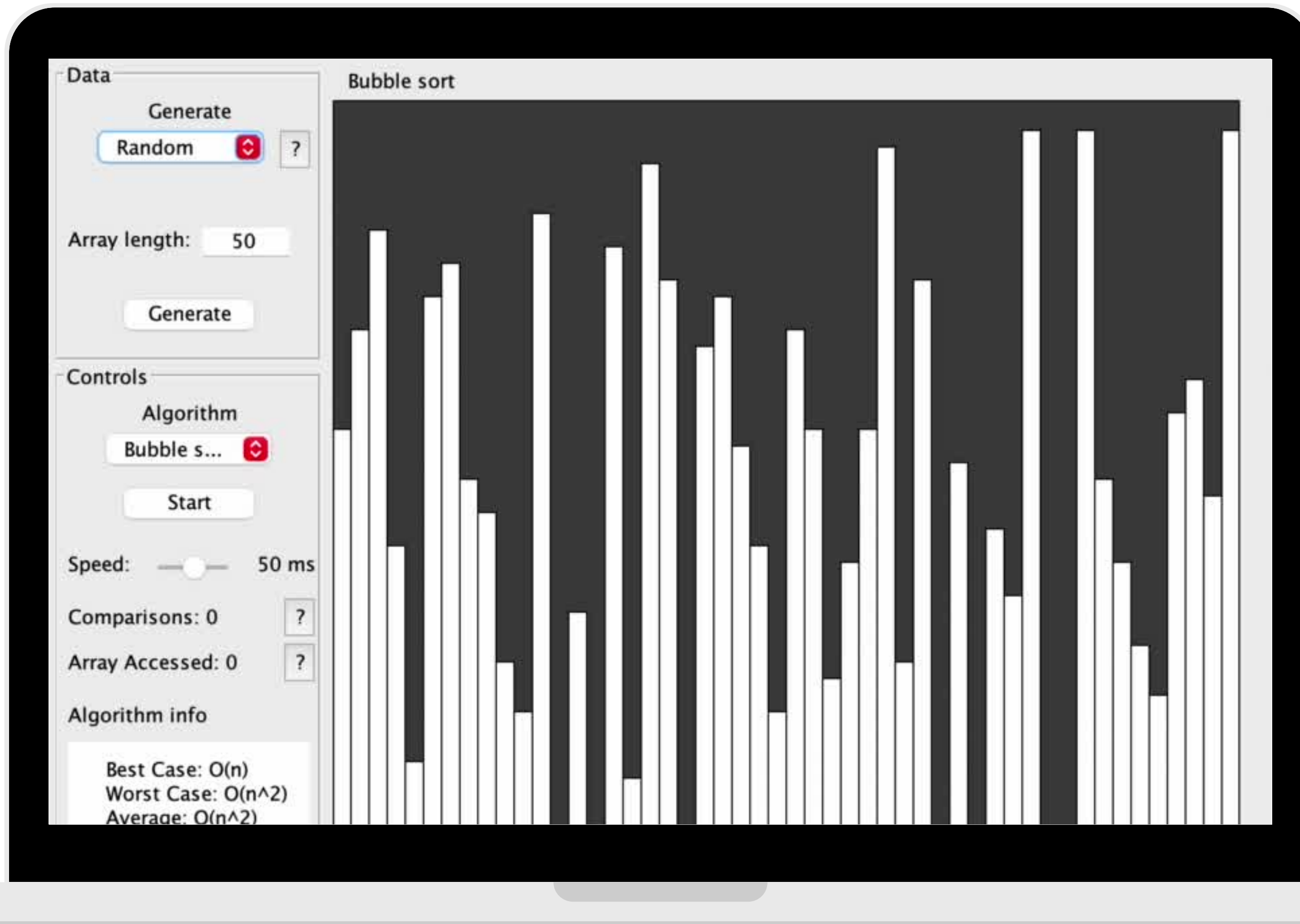
Polymorphism + Inheritance



Inheritance: AbsSort class inherit from swap interface

Polymorphism: 3 class sort extend class Abs for override from method sort abs

Demo Video



Thank You!

Do you have any question?

