

## Prac 7 Design

### Sorting:

| Sort   |
|--|
| vector<int> initialVec<br>vector<int> sortedVec  |
| Virtual vector<int> sort – will sort a vector and return the sorted vector, will be defined in derived classes<br>void setIVec – sets the initial vector, will take in an integer to denote position<br>int getIVec – returns the initial vector, will take in an integer to denote position<br>void setSVec - sets the sorted vector, will take in an integer to denote position<br>int getSVec - returns the sorted vector, will take in an integer to denote position |

- This is the base class
- This class will not be able to be created as it will have a virtual function in it
- Has the set and get functions to set and get the initial vector and sorted vector
- Has the virtual function sort which will be defined in the derived classes

| BubbleSort   |
|--|
|  |
| vector<int> sort – will sort a vector using bubble sort and return the sorted vector |

- Inherits from the class Sort
- Will define the function sort so that it does bubble sort on the given vector

| QuickSort   |
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|   |
| vector<int> sort – will sort a vector using quick sort and return the sorted vector |

- Inherits from the class Sort
- Will define the function sort so that it does quick sort on the given vector

## Prac 7 Design

### Search:

| Search  |
|---|
| vector<int> initialVec<br>bool searchRes  |
| Virtual bool search – will search a vector and return whether the vector contains 0, will be defined in derived classes<br>void setIVec - sets the initial vector, will take in an integer to denote position<br>int getIVec - returns the initial vector, will take in an integer to denote position<br>void setSearchRes – set whether 0 is or isn't contained in the given vector<br>bool getSearchRes – returns whether 0 is or isn't contained in the given vector |

- This is the base class
- This class will not be able to be created as it will have a virtual function in it
- Has the set and get functions to set and get the initial vector and search result
- Has the virtual function search which will be defined in the derived classes

| RecursiveBinarySearch   |
|---|
|   |
| bool search – will search a vector and return whether the vector contains 0 |

- Inherits from the class Search
- Will define the function search so that it does recursive binary search on the given vector

| ThreePartSearch   |
|---|
|   |
| bool search – will search a vector and return whether the vector contains 0 |

- Inherits from the class Search
- Will define the function search so that it does three part search on the given vector

## Prac 7 Design

### Main:

- Will take in a string as input
- Will then extract the numbers from this string and store them in a vector
- It will then run quick sort on the vector and store this result
- On the resulting vector it will then run three part search
- It will then print out whether the initial vector contained zero and the sorted vector

### Testing:

Input 1:

1 3 5 4 -5 100 7777 2014 0

Output 1:

true -5 0 1 3 4 5 100 2014 7777

Input 2:

1 3 5 4 -5 100 7777 2014

Output 2:

false -5 1 3 4 5 100 2014 7777

Input 3:

4 -2

Output 3:

false -2 4

Input 4:

1 5 0 -100 -100 3 70 0

Output 4:

true -100 -100 0 0 1 3 5 70

Input 5:

0

Output 5:

true 0

Input 6:

1

Output 6:

false 1

### Inheritance trees

