

Sorting & Searching

Code Repository

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bit.ly/javascaler

Lecture

passing arrays to functions

linear search

binary search

sorting

bubble sort

selection sort

insertion sort

Java is **Pass by**
Value!

but there are reference variables as well....

Understanding Reference variable

1. Reference variable is used to point object/values.
2. Classes, interfaces, arrays, enumerations, and, annotations are reference types in Java. Reference variables hold the objects/values of reference types in Java.
3. Reference variable can also store **null** value. By default, if no object is passed to a reference variable then it will store a null value.
4. You can access object members using a reference variable using **dot** syntax

Searching

Searching in Arrays



Linear Search

Searching algorithm to find the index of element in a given array.

Binary Search



Efficient searching algorithm to find the index of element in a given **sorted** array.



Time to Think!



8 Mins

Square Root

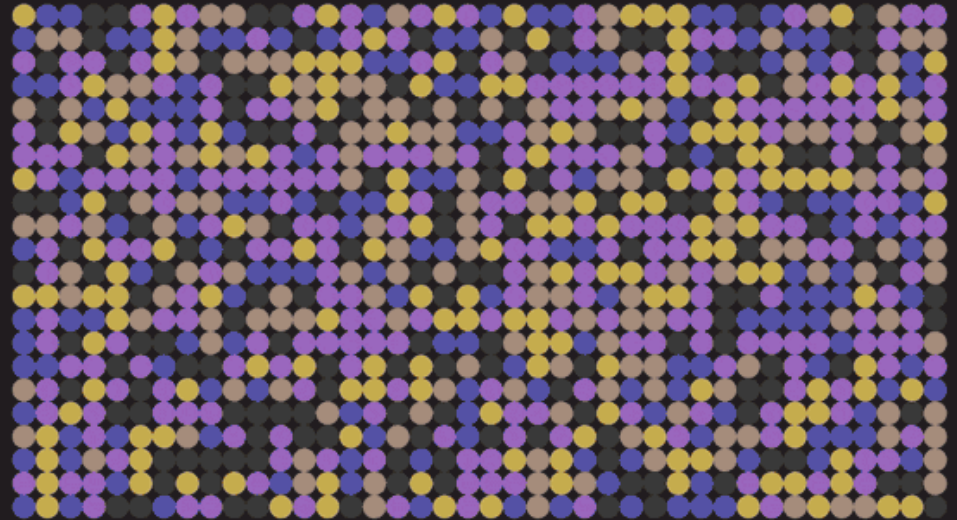
Write a method to find square root of a number efficiently using binary search.

Next Class

Sorting in Arrays

Basic Algorithms

- Bubble Sort
- Selection Sort
- Insertion Sort



What is Sorting?

```
//Unsorted Array
```

```
a = {10,12,5,4,1,3,2};
```

```
//Sorted Array in Increasing Order
```

```
a = {1,2,3,4,5,10,12}
```

```
//Sorted Array in Decreasing Order
```

```
a = {12,10,5,4,3,2,1}
```


Bubble Sort



Key Idea

Take *larger element* to the end by repeatedly swapping the adjacent elements.

Selection Sort



Key Idea

Repeatedly find the minimum element from unsorted part and putting it at the beginning.

Insertion Sort



Key Idea

Insertion sort is similar to playing cards in our hands.



Insert the *card* in its correct position in a sorted part.