

DSA through Java

Array data structure



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Agenda

- ① Types of variables in Java
- ② About Arrays
- ③ When to use Arrays?
- ④ Conventional approach to solve a problem
- ⑤ Conclusion
- ⑥ Array data structure

Types of variables in Java

- ① Value type variables (ordinary variables of primitive types)
- ② Nullable type variables (Reference variables of non primitive type or array reference variables of any type)

int x;

float y;

Student s1;

int []a;

Student []s;

About Arrays

- Array is a linear collection of similar elements.
- Array elements are indexed
- Array in java is always created dynamically.
- [] is called subscript operator
- All arrays have length property which contains the length of the array.

```
int []a = new int[5];
```



- Accessing Array elements is fast.
- It takes constant time to access any item of the array if index is known.

When to use array?

whenever group of related data is need
to be stored

when data is in a group of groups.

To solve a programming problem,
you have to store marks of 100
students. How can you implement it?

```
int []a = new int [100];
```

Suppose you have created an array as:

`int []a = new int[100];`

And assume that you have stored some
out of 100 data in this array.

Now answer following questions :

1. How many elements are stored in the array?
2. If suppose 10 elements are stored and then I want to store one more element at index 2. Can we do it as
`a[2] = data;`

3. How to guard against overflow or underflow?

4. How to delete an element?

Conclusion

- Normal array is not good enough to efficiently handle such situations.
- We need to keep extra information like, index of last filled block
(assume elements are filled from left to right) to track the number of elements present in the array

We need to create an array data structure in Java

Define a class Array with appropriate number of variables and functions.

