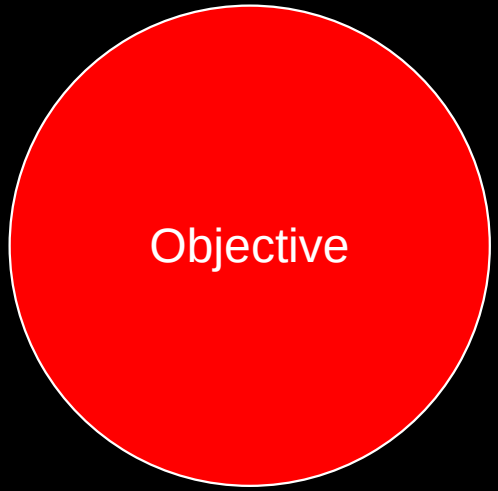
Data Structure and Algorithms

Lecture 1 & 2 : Introduction

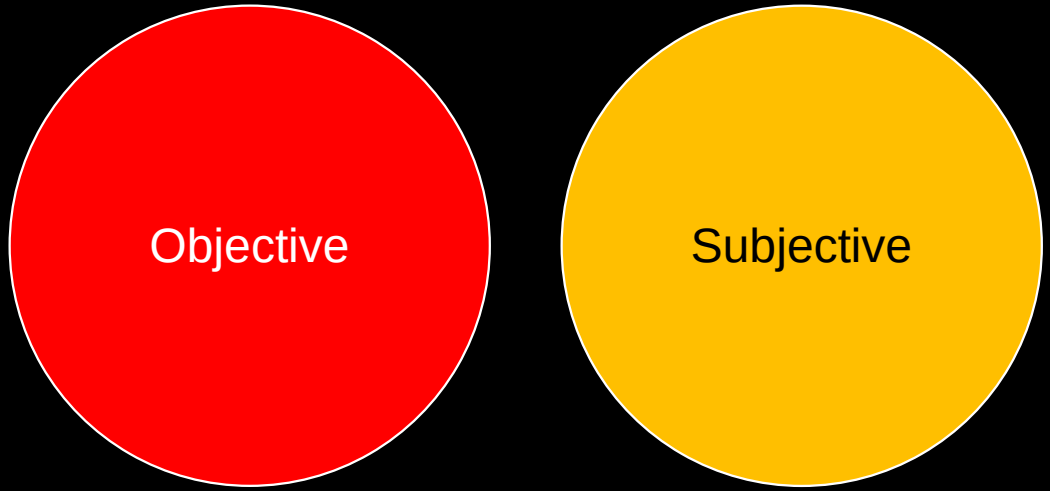
Things to cover

- Array
- Stack and Queue
- Linked List
- Tree
- Graph
- Search & Sort
- Hashing

What is Data ?



What is Data ?



Data Structure ?

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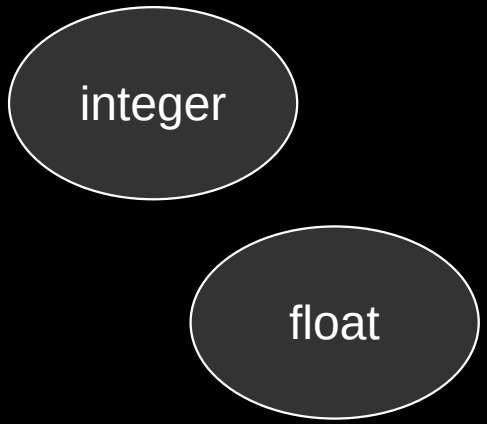
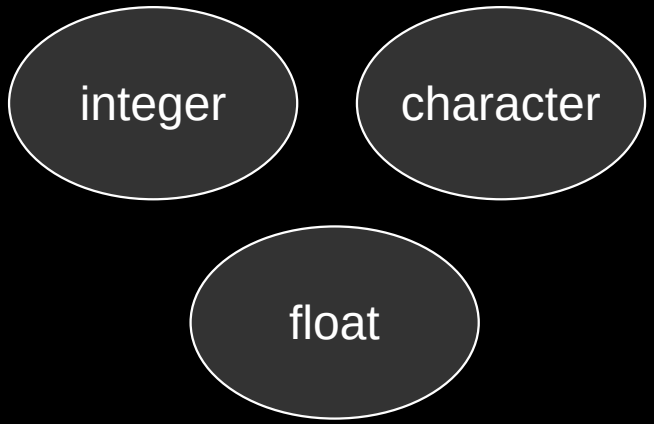
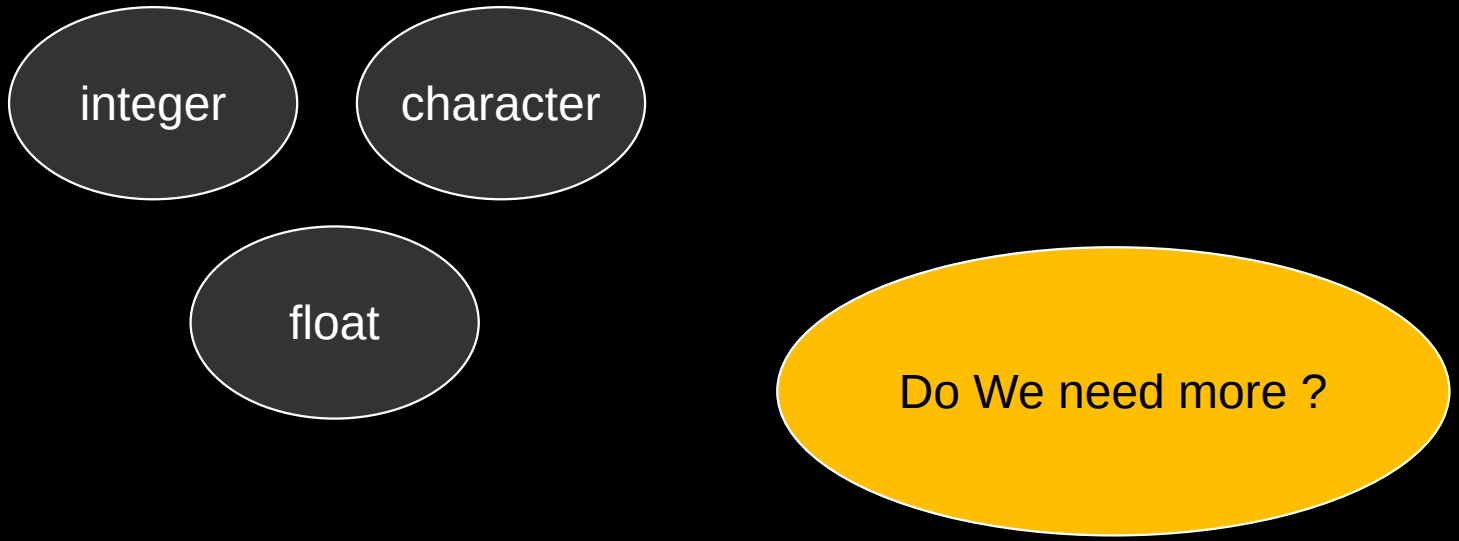


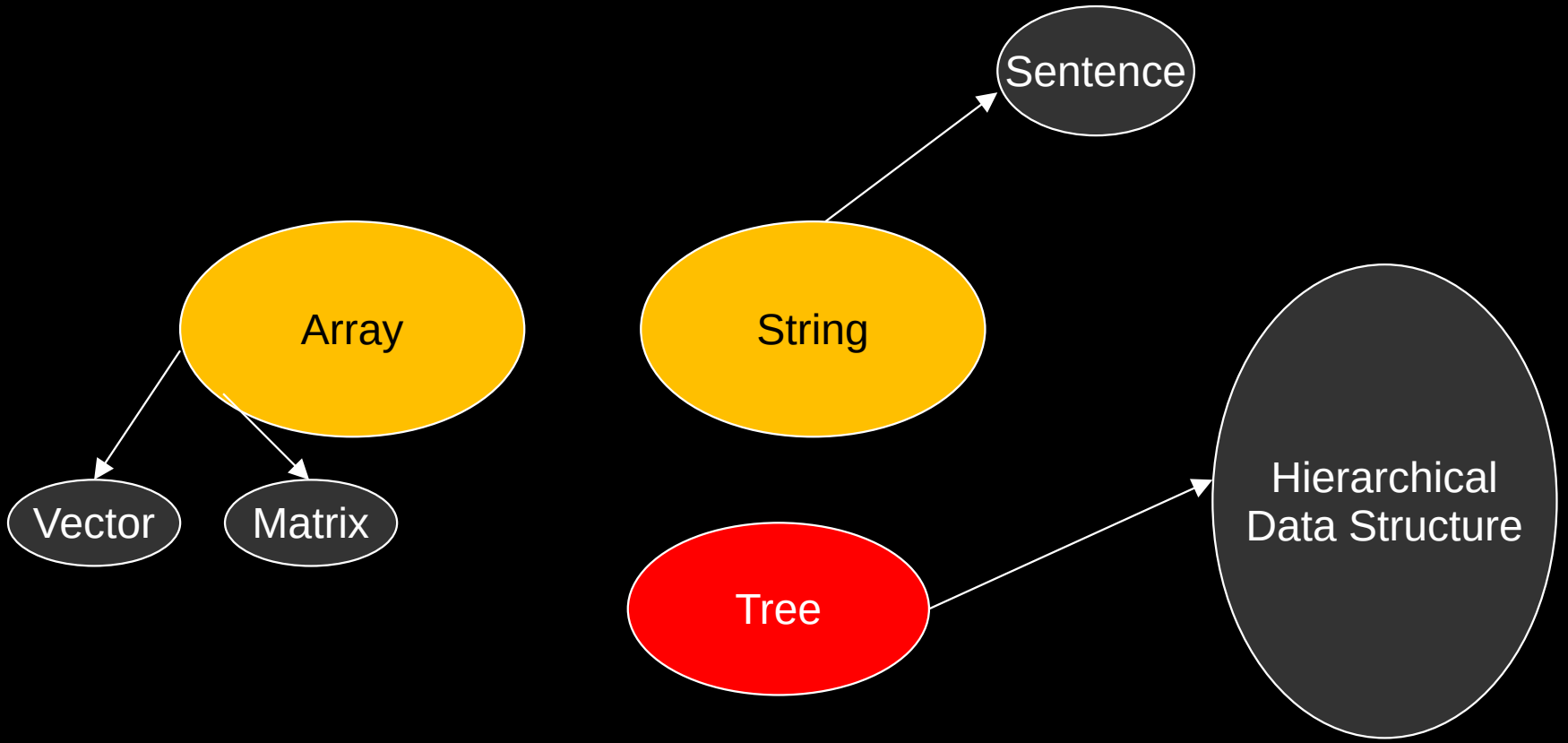
Data Structure ?



Data Structure ?



YES. But WHY ? Example

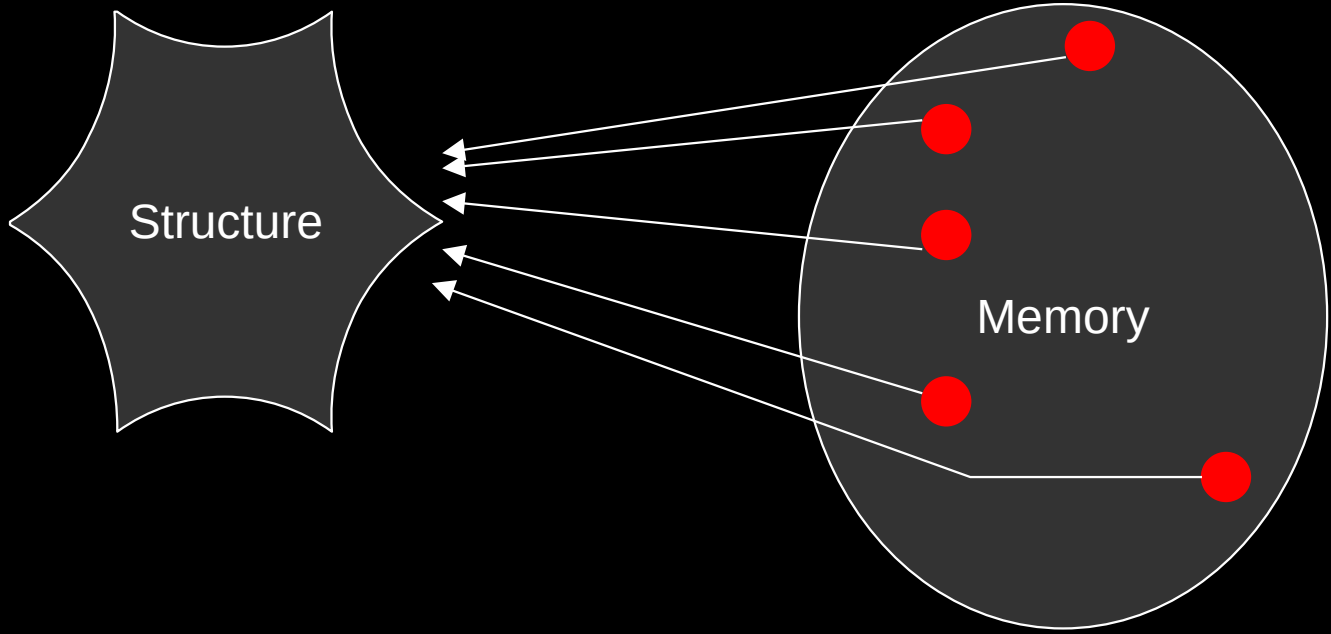


Search & Sort

TIME Complexity

Computational Complexity

Data Structure vs. Data Type



Array

int a[3]; => an integer array of length 3

a[0] = 4;
a[1] = 5;
a[2] = 5;

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```
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a[1] = 5;
a[2] = 5;
```

```
for (int i=0;i<3;i++){
      scanf(“%d”, &arr[i]);
}
```

```
int arr[5] = {1, 5, 3, 3, 2};
```

```
int arr[] = {1, 5, 3, 3, 2};
```

```
int arr[10] = {0};
```

Array (sparse)

Int a[15] = {1, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0};

Array (sparse)

```
int a[15] = {1, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0};
```

```
int a[15] = {[0] = 1, [5] = 2};
```