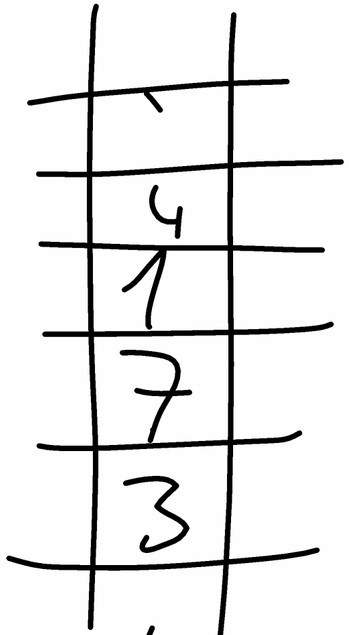
DATA STRUCTURES

Wed 3 APR 2019

Examples:

Array: [3, 7, 1, 4] In C, it's contiguous chunk of memory



Random access

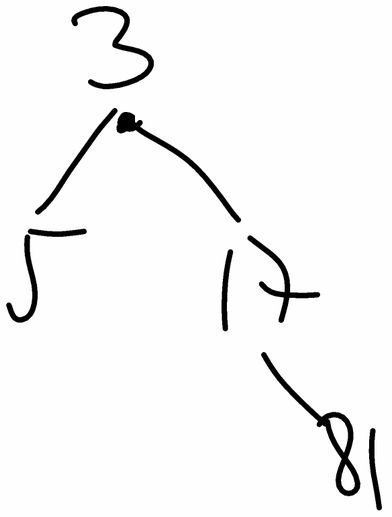
A[7] → 8th elem

A[3] → 4th elem

- This gives rise to expectations on how to access the data of the array
- In C, array has all elements same type!!

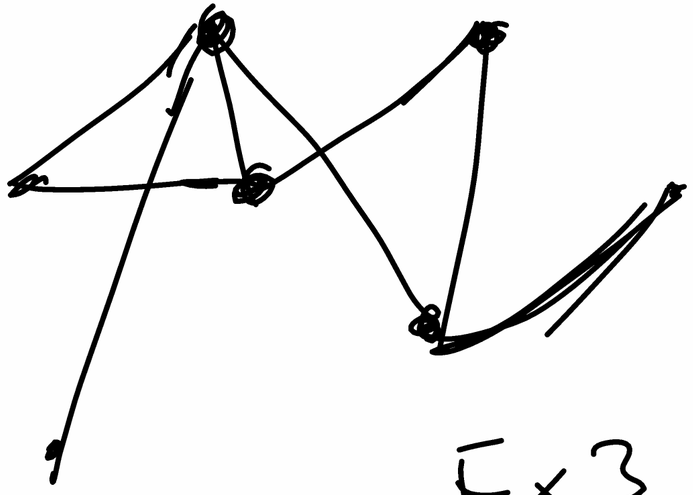
IN DATA STRUCTURES WE "MENTALLY ORGANIZE THE DATA IN PARTICULAR WAYS", i.e., WE "REPRESENT THE DATA IN PARTICULAR".

Ex. Heap-sort: Takes an $A=[81,17,3,5]$ & sorts it, by thinking of it as if it were a TREE



Ex2: GRAPH

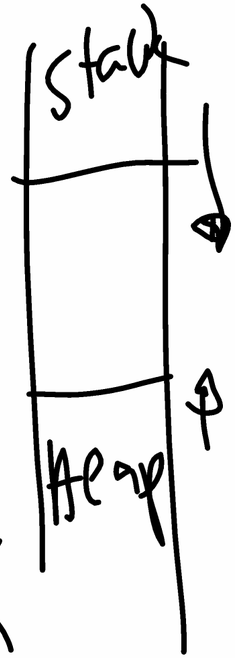
Example: Garmin Finding shortest trip directions to a destination



Ex3: a) Linked-list

b) Queues: FIFO

c) Record (in C struct) FILO ≡ Stack

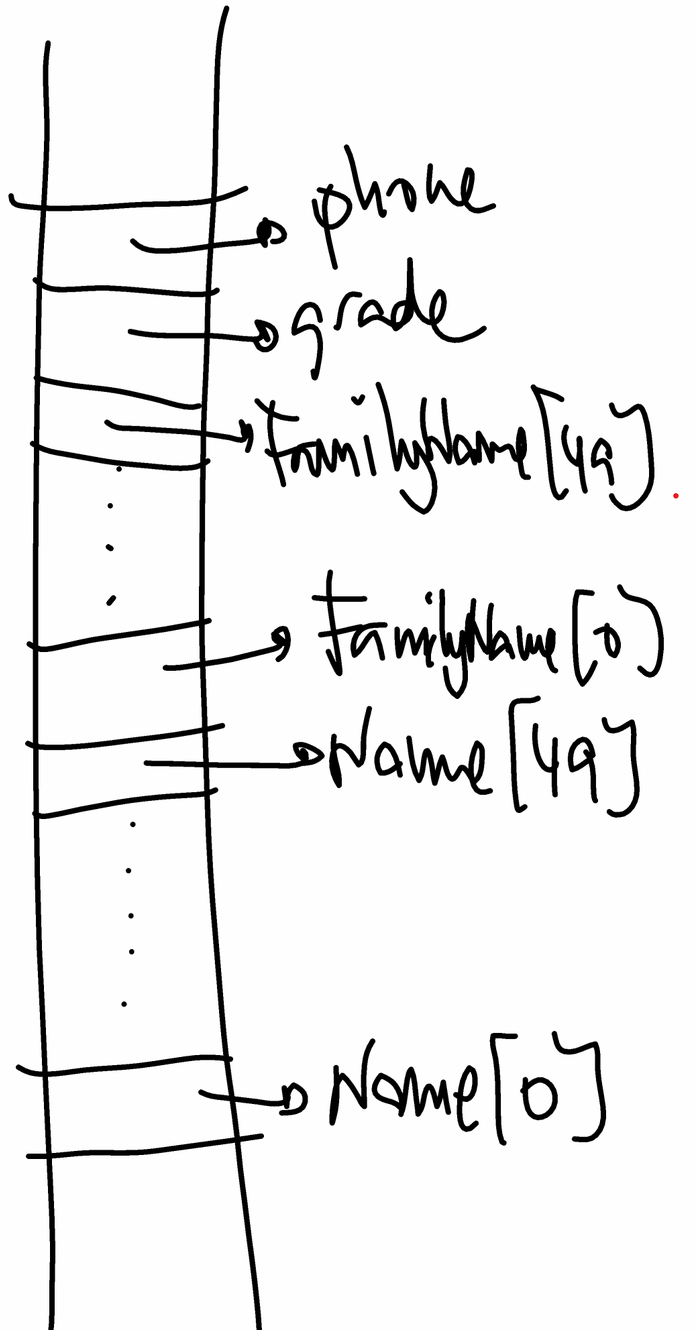


Ex4: Dictionaries (Hash table)

RECORD (in C)

```
struct student {
        char [50] Name;
        char [50] Familyname;
        float grade;
        int phone;
} student;

student teddy;
teddy.Name = "Teddy";
teddy.grade = 30.5;
```



Linked list

Kind of an "array" where elements are NOT aligned in memory