

CSE 20

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Dictionary

Bad name for a Hashmap b/c it maps A

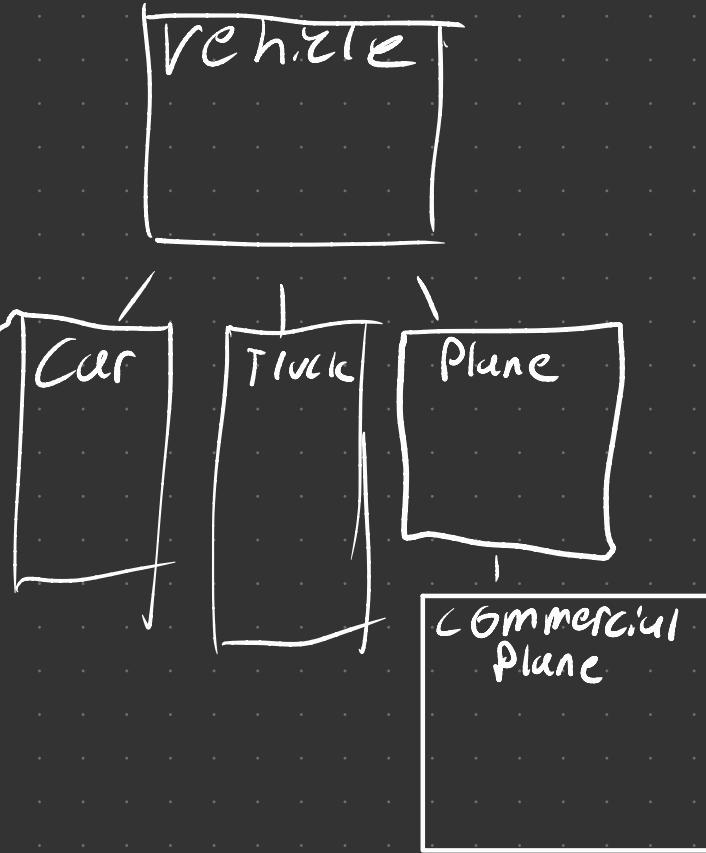
key → value	
"SF"	415
"SJ"	408
"Oakland"	510

"known as a
key, value pair"

"SF" ∈ K
"415" ∈ V
but we don't
look up using
values.

Remark on "Hashing":
In python we have
to pass an immutable
type as a key.

Classes



is a vs has a

class Animal:
Self, eyes
Self, weight

class Bird(Animal):
Self, feathers

Bird is an animal,
but an animal
doesn't have a
feather field

Recursion

Linear Recursion

- Palindrome is linear
- Bonny ears is linear

```
def sum_list(lst) -> int:
```

```
    if len(lst) == 0:
```

ret 0 # remember we are returning an int

else:

```
    ret int lst[0] + sum_list(lst[1:])
```

any for the next fn call is a copy of the list but starting at the 1 index, thereby, removing the 0th index object from the next call

this is similar to the last quiz where we had to move the "list pointer" forward

to check the next index in the str.
I want you to keep in mind that an String is a list of characters.

`["a", "b", ... "z"]`

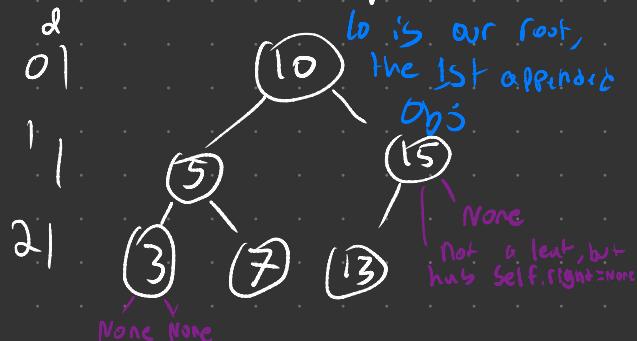
⁰ ¹ ²⁶

Binary Recursion

- Binary search
- Fib is binary we have a sorted list of objects

Binary Search on a binary Search tree (BST)

A BST can be thought of as sorted list of the inverse of its structure and append operation



Note: When an object has None for both its left, right attributes then it's a leaf node.

modules

modules are Python libraries
that you can import so you
can use the modules classes & methods.

ex

import numpy as np

np.random (n, n)