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# Programming Languages Final Project

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# Python Closure

- Computer Class
  - getSpecs = dictionary of data
    - Name, CPU, # of CPU, Motherboard, RAM, Harddrive, PSU
- SuperComp and Gaming Class
  - Inherits from Computer Class
  - Have additional specs
- Program Class

# Python Closure

- Data is kept in dictionary in getSpecs
- Cf is a function within getSpecs that is essentially a setter and a getter
- getSpecs is set to run
- Run is called to get and set data

# Testing Python Closure

- (exec 'import test;
- c1=test.Computer(); //create object
- c1.run("\$name")("I am a computer"); //set
- toReturn = c1.run("name")) //get

•(exec 'import test; c1=test.Computer(); c1.run("name"); c1.run("\$name")("I am a computer");  
toReturn = c1.run("name"))

Anyone remember these guys?



# Java Stream Operations

- Created Pokemon and Strengths classes
  - Pokemon class has Id, Name, type1, type2
    - type1 and type2 are the pokemon type of the pokemon (Fire, water, grass, etc.)
  - Strengths class has Type, Str1, Str2, Str3, Str4
    - Type is strong against Str1, Str2, Str3, and Str4
- Created pokemonparse.java
  - Functions: loadData(), getIds(), getAllOfType(), getStrong(), and getStrongPokemons()
  - loadData() - Loads data by reading files pokemon and strength and storing them in pokedex and strengths
  - The other functions use Java Stream Operations to do List Comprehension

# Testing Java Stream Operations

- In mini\_ply:
  - (exec 'import pokemonparse;
  - pokemonparse.loadData(); //loads the data from the files, creating objects as it goes
  - pokemonparse.getIds(["Pikachu","Beedrill"]) //goes through pokedex and returns the IDs of a list of pokemon names
  - ')
- (exec 'import pokemonparse; pokemonparse.loadData(); pokemonparse.getIds(["Pikachu","Beedrill"])'')

# Python Lambda and List Comprehension

- Used Python Lambda and List Comprehension to implement FindStrongPokemon function in mini-lisp
  - The function takes in 3 parameters: List(pokemon), List(strengths), List(strongtype)
  - Created a ListLoader function to import ListMaker.py and return the resulting list
  - Created ListMaker.py to make a list when given a file name
  - Added code to the env() to implement FindStrongPokemon (see next slide)
- 
- Input format: (FindStrongPokemon (ListMaker 'databaseofpokemon') (ListMaker 'database of strengths') ('pokemontype'))



# Exploring the Lambda Function

- Inside lis.py

'FindStrongPokemon' :

lambda pokedex, strengths, strongType:

```
[[pokemontype, sorted([p[1] for p in pokedex if p[2] == pokemontype or p[3] ==  
pokemontype])]]
```

```
for pokemontype in sorted({s[0] for s in strengths if s[1] == strongType[0] or s[2] ==  
strongType[0] or s[3] == strongType[0] or s[4] == strongType[0]})
```

# Testing Python Lambda and List Comprehension

- `(FindStrongPokemon`
  - `(ListLoader 'pokemon') //loads pokemon into a list, list acts as pokedex parameter`
  - `(ListLoader 'strength') //loads strength into a list, list acts as strengths parameter`
  - `'(Grass) //list acts as strongtype parameter`
  - `)`
- 
- `(FindStrongPokemon (ListLoader 'pokemon')(ListLoader 'strength')'(Grass))`

# Swift

```
let apples = 3
```

```
let oranges = 5
```

```
let appleSummary = "I have \(apples) apples."
```

```
let fruitSummary = "I have \(apples + oranges) pieces of fruit."
```

```
print(fruitSummary)
```



