

# CSC680 Senior Oral Presentation

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# Project Proposal

Create an interactive Pokédex containing the original 151 Pokémon.

Must haves:

- List of 151 Pokémon
- Detail screen showing stats and information of each Pokémon
- Compare two Pokémon to see which has the advantage

Nice to haves:

- Search bar to easily select Pokémon in the list
- More visually appealing TableView

# Project Approach

# Data First

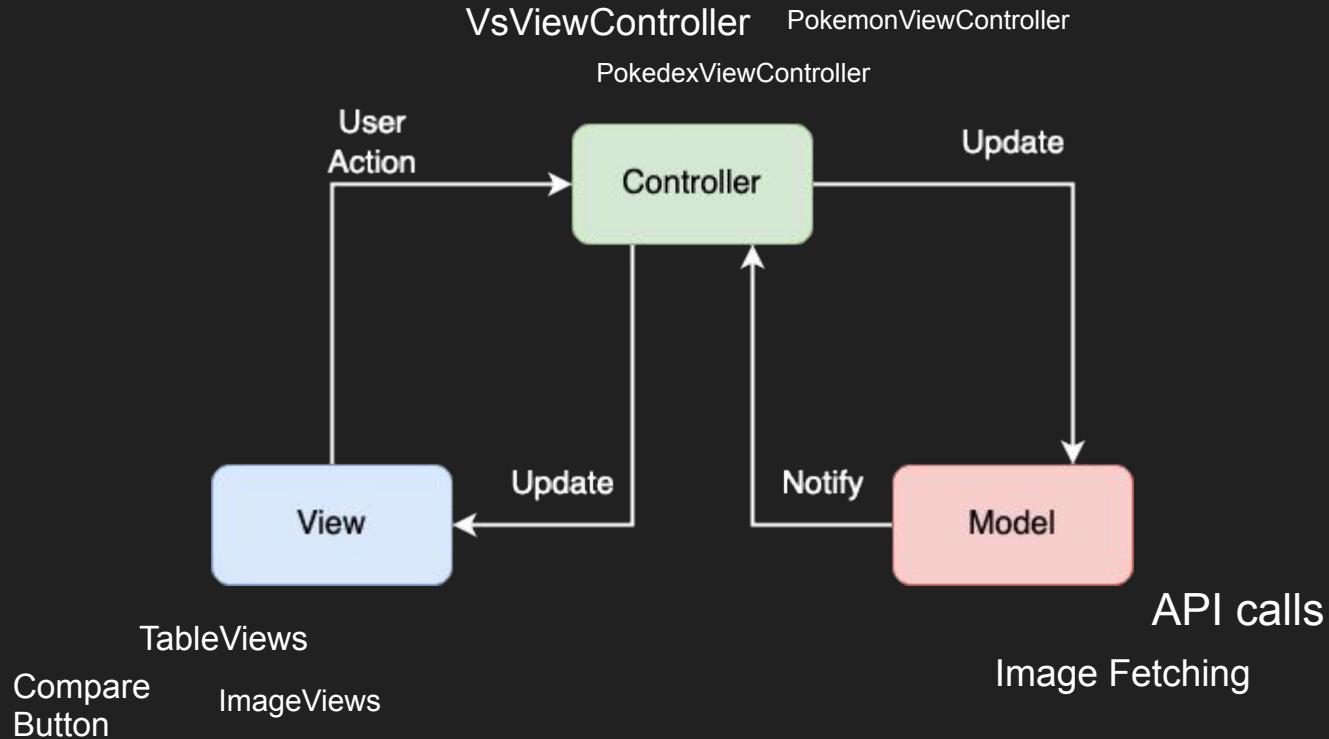
- Set up data models
- Create Networking functions to fetch data
- Make sure JSON decoding works

## Why data first?

- Makes debugging the API calls and data models easier
- Prepare real data to be used when creating the UI

# App Architecture

## MVC



# Networking / API Calls

<https://pokeapi.co/api/v2/pokemon?limit=151>

- List of Pokemon 1-151

<https://pokeapi.co/api/v2/pokemon/{name}>

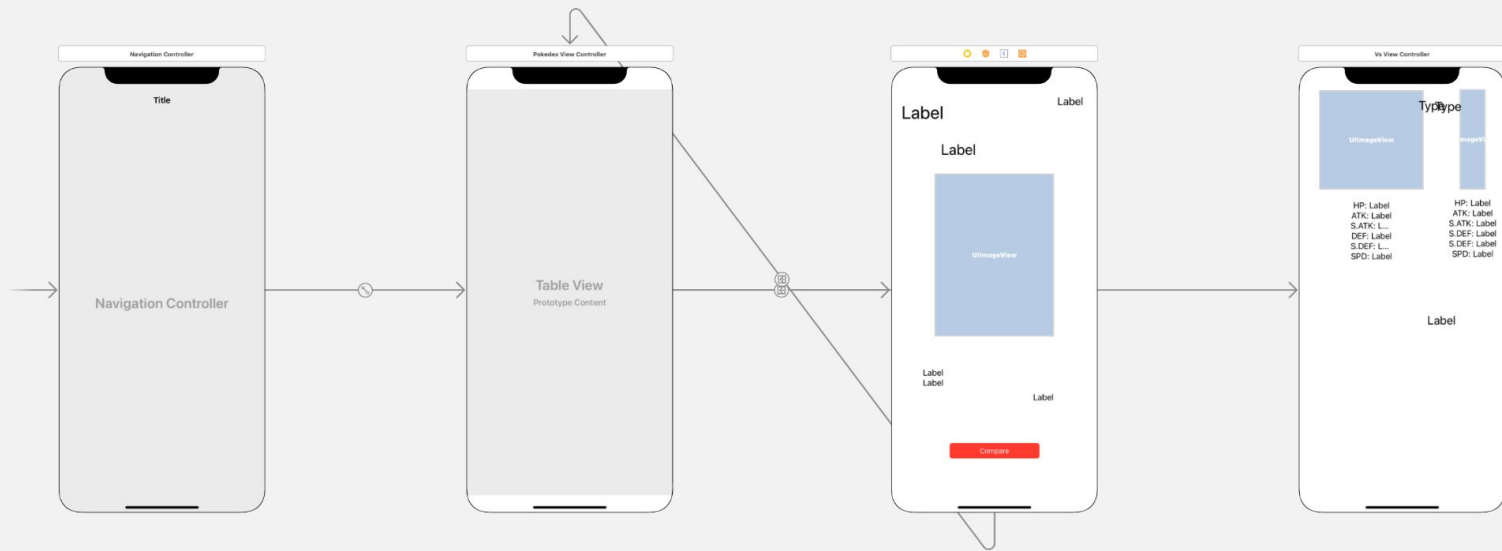
- Specific information (stats) of given Pokemon

<https://pokeapi.co/api/v2/pokemon-species/{name}>

- Flavor text for given Pokemon

+ Image fetching

# App Flow



# Challenges and Issues



# Type advantages and disadvantages

```

"normal": [
  "normal": 1.0,
  "fire": 1.0,
  "water": 1.0,
  "electric": 1.0,
  "grass": 1.0,
  "ice": 1.0,
  "fighting": 1.0,
  "poison": 1.0,
  "ground": 1.0,
  "flying": 1.0,
  "psychic": 1.0,
  "bug": 1.0,
  "rock": 0.5,
  "ghost": 0,
  "dragon": 1.0,
  "dark": 1.0,
  "steel": 0.5
],
"fire": [
  "normal": 1.0,
  "fire": 0.5,
  "water": 0.5,
  "electric": 1.0,
  "grass": 2,
  "ice": 2,
  "fighting": 1.0,
  "poison": 1.0,
  "ground": 1.0,
  "flying": 1.0,
  "psychic": 1.0,
  "bug": 2,
  "rock": 0.5,
  "ghost": 1.0,
  "dragon": 0.5,
  "dark": 1.0,
  "steel": 2
]

```

Defender \ Attacker	Normal	Fire	Water	Grass	Electric	Ice	Fighting	Poison	Ground	Flying	Psychic	Bug	Rock	Ghost	Dragon	Dark	Steel	Fairy
Normal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fire	1/2	1/2	2	2	2	2	1	1	1	1	1	2	1/2	0	1/2	1	2	1/2
Water	2	1/2	1/2	1	1	1	1	1	2	1	1	2	2	1/2	1/2	1	1	1
Grass	1/2	2	1/2	1	1	1	1	1	2	1/2	1	1/2	2	1	1/2	1	1/2	1
Electric	1	1	2	1/2	1/2	1	1	1	0	2	1	1	1	1	1/2	1	1	1
Ice	1/2	1/2	2	1	1	1	1	1	2	2	1	1	1	1	2	1	1/2	1
Fighting	2	1	1	1	1	1	1	1	1/2	1/2	1/2	1/2	2	0	1	2	2	1/2
Poison	1	1	1	2	1	1	1	1	1/2	1/2	1	1	1/2	1/2	1	1	0	2
Ground	2	1	1	1/2	2	1	1	1	2	0	1	1/2	2	1	1	1	2	1
Flying	1	1	1	2	1/2	1	1	1	1	1	1	2	1/2	1	1	1	1/2	1
Psychic	1	1	1	1	1	1	2	2	1	1	1	1/2	1	1	1	0	1/2	1
Bug	1/2	1	2	1	1	1	1/2	1/2	1/2	2	1	1	1	1/2	2	1/2	1/2	1/2
Rock	2	1	1	1	2	1/2	1	1	1/2	2	1	2	1	1	1	1	1/2	1
Ghost	0	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1/2	1	1
Dragon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1/2	0
Dark	1	1	1	1	1	1	1/2	1	1	1	2	1	1	2	1	1/2	1	1/2
Steel	1/2	1/2	1	1/2	2	1	1	1	1	1	1	2	1	1	1	1/2	1/2	2
Fairy	1/2	1	1	1	1	2	1/2	1	1	1	1	1	1	2	2	1/2	1/2	1

# Type advantages and disadvantages

< Squirtle vs ...

Squirtle vs Charmander



HP: 44  
ATK: 48  
S.ATK: 50  
DEF: 65  
S.DEF: 64  
SPD: 43

Water

Fire

Squirtle has the type  
advantage over  
Charmander

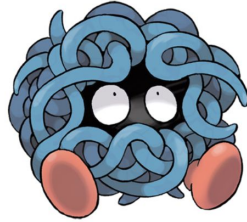


HP: 39  
ATK: 52  
S.ATK: 60  
S.DEF: 43  
S.DEF: 50  
SPD: 65

# Type advantages and disadvantages

< Tangela vs ...

Tangela vs Gyarados



HP: 65  
ATK: 55  
S.ATK: 100  
DEF: 115  
S.DEF: 40  
SPD: 60

Grass

Water /  
Flying

No one has a  
type advantage



HP: 95  
ATK: 125  
S.ATK: 60  
S.DEF: 79  
S.DEF: 100  
SPD: 81

# Type advantages and disadvantages

< Onix vs ...



HP: 35  
ATK: 45  
S.ATK: 30  
DEF: 160  
S.DEF: 45  
SPD: 70

Onix vs Charizard

Rock /  
Ground      Fire /  
Flying

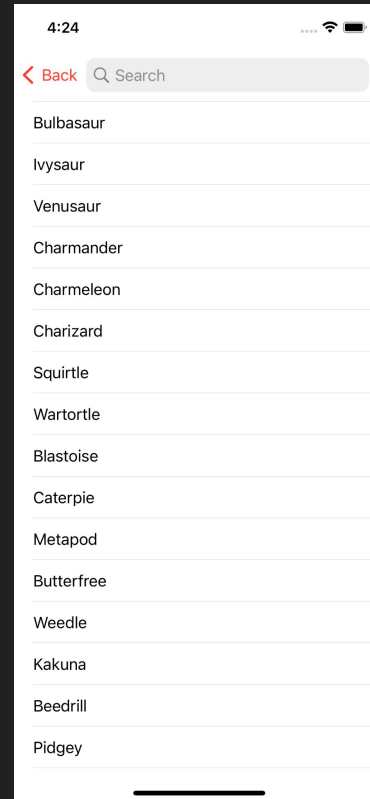
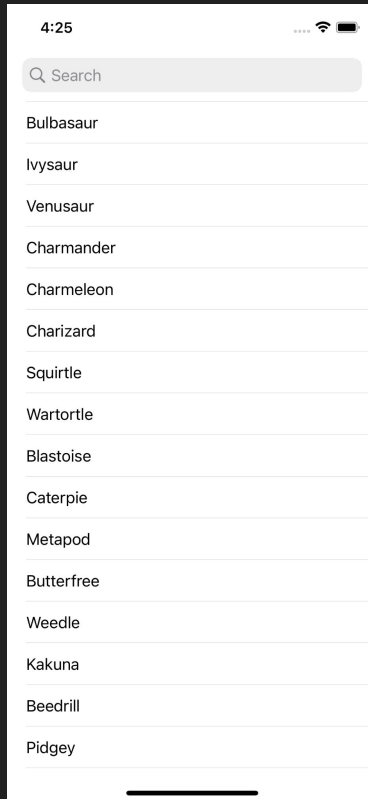
Onix has the type  
advantage over  
Charizard

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HP: 78  
ATK: 84  
S.ATK: 109  
S.DEF: 78  
S.DEF: 85  
SPD: 100

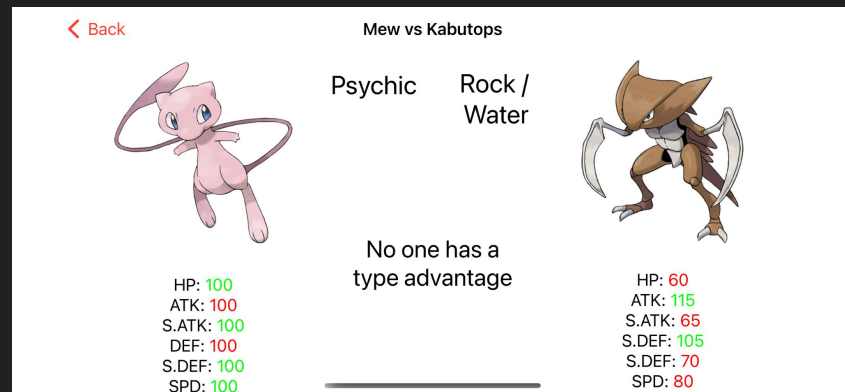
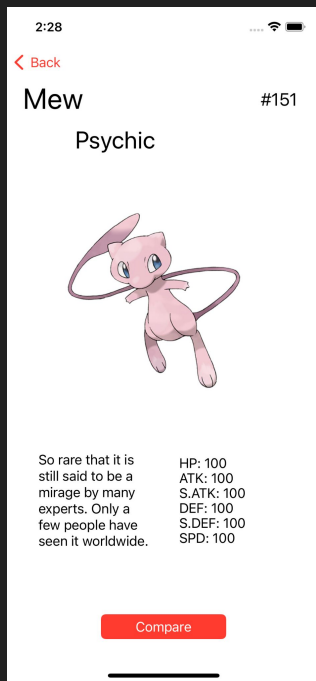
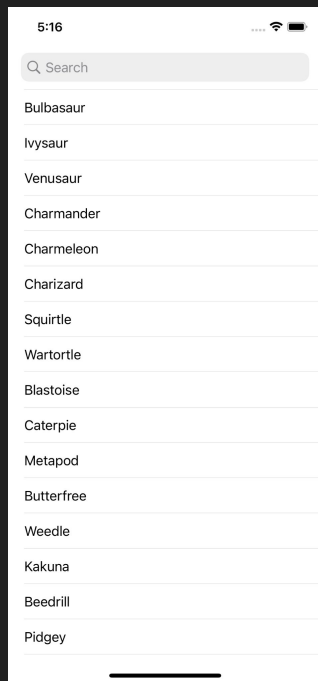
# Search bar issue



Improvements

# UI Customization

- Visually appealing cells in the TableViews
- Layout for Pokemon detail screen and the comparison screen



# Refactoring

```
extension StringProtocol {
    var firstCapitalized: String { prefix(1).capitalized + dropFirst() }
}

func hectogramsToLbs(weight: Int) -> Int {
    return weight / Int(4.536)
}

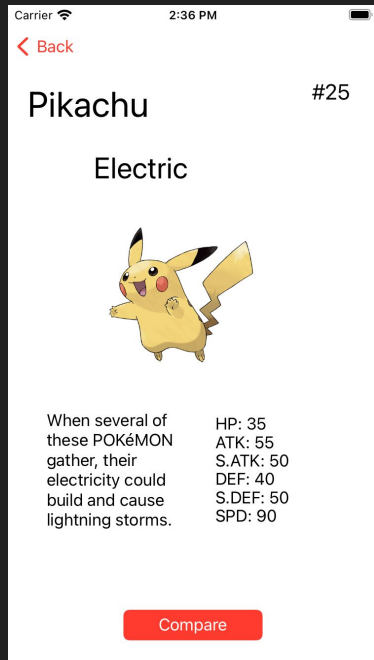
func decimetersToInches(height: Int) -> Int {
    return height * Int(3.937)
}

func hasAdvantage(type1: [TypeElement], type2: [TypeElement]) -> Double {
    var multiplier = 1.0
    for i in 0...type1.count-1 {
        for j in 0...type2.count-1 {
            let t1 = type1[i].type!.name!
            let t2 = type2[j].type!.name!
            let mult = typeMatchups[t1][t2]!
            // avoid 0 mult if pokemon has 2 types
            if (mult == 0 && type1.count == 2) {
                multiplier *= 1
            } else {
                multiplier *= mult
            }
        }
    }
    return multiplier
}
```

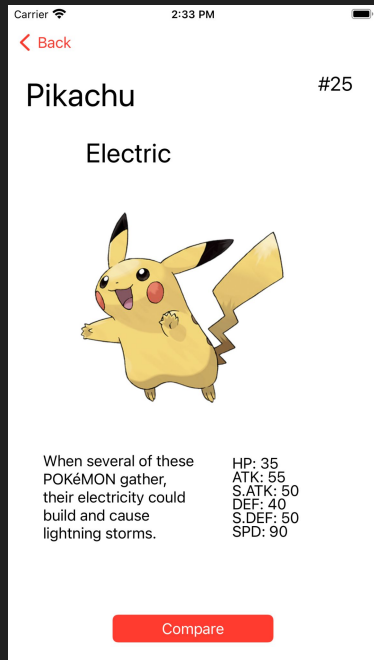
```
private func fetchImage() {
    let imageURL = URL(string: (pokemon1?.sprites?.other?.officialArtwork?.frontDefault!))
    var image: UIImage?
    if let url = imageURL {
        // network operations have to run on different thread (not on the main thread)
        DispatchQueue.global(qos: .userInitiated).async {
            let imageData = NSData(contentsOf: url)
            // UI changes have to run on main thread.
            DispatchQueue.main.async {
                if imageData != nil {
                    image = UIImage(data: imageData! as Data)
                    self.pokemonImage1.image = image
                } else {
                    image = nil
                }
            }
        }
    }
    let imageURL2 = URL(string: (pokemon2?.sprites?.other?.officialArtwork?.frontDefault!))
    var image2: UIImage?
    if let url = imageURL2 {
        DispatchQueue.global(qos: .userInitiated).async {
            let imageData = NSData(contentsOf: url)
            DispatchQueue.main.async {
                if imageData != nil {
                    image2 = UIImage(data: imageData! as Data)
                    self.pokemonImage2.image = image2
                } else {
                    image2 = nil
                }
            }
        }
    }
}
```



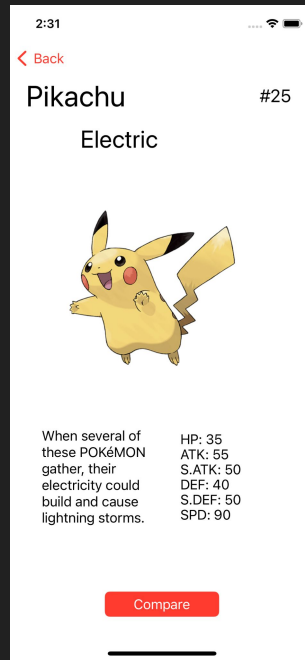
# Device Compatibility



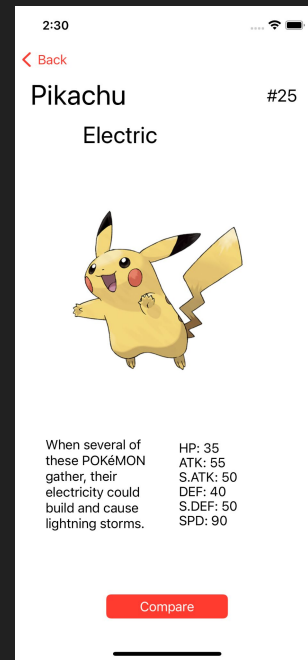
iPhone SE (2nd gen)



iPhone 8 Plus



iPhone 11 Pro



iPhone 13 Pro

# Device Compatibility


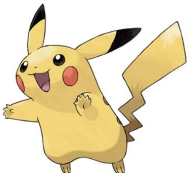
## iPhone SE (2nd gen)

< Back

Pikachu vs Bulbasaur

Electric Grass / Poison

Bulbasaur has the type advantage over Pikachu



HP: 35	HP: 45
ATK: 55	ATK: 49
S.ATK: 50	S.ATK: 65
DEF: 40	S.DEF: 49
S.DEF: 50	S.DEF: 65
	SPD: 45



## iPhone 8 Plus

< Back

Pikachu vs Bulbasaur

Electric Grass / Poison

Bulbasaur has the type advantage over Pikachu



HP: 35	HP: 45
ATK: 55	ATK: 49
S.ATK: 50	S.ATK: 65
DEF: 40	S.DEF: 49
S.DEF: 50	S.DEF: 65
SPD: 90	SPD: 45



## iPhone 11 Pro

< Back

Pikachu vs Bulbasaur

Electric Grass / Poison

Bulbasaur has the type advantage over Pikachu



HP: 35	HP: 45
ATK: 55	ATK: 49
S.ATK: 50	S.ATK: 65
DEF: 40	S.DEF: 49
S.DEF: 60	S.DEF: 65
	SPD: 45

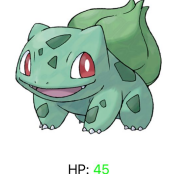

## iPhone 13 Pro

< Back

Pikachu vs Bulbasaur

Electric Grass / Poison

Bulbasaur has the type advantage over Pikachu



HP: 35	HP: 45
ATK: 65	ATK: 49
S.ATK: 50	S.ATK: 65
DEF: 40	S.DEF: 49
S.DEF: 50	S.DEF: 65
SPD: 90	SPD: 45

