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NET CENTRIC – FINAL PROJECT

I. Summary

- **Overall process:** Pokedex, Pokebat and Pokecat are implemented. Some additional requirements are not fully developed.
- **File structure:** Separated the 2 games for testing. Each game has a database file and client-server set up. Detailed information about how to deploy and run each game will be discuss in the below sections.

📁 Pokemon-Database-System-pokebat	6/14/2024 1:53 PM	File folder
📁 Pokemon-Database-System-pokecat	6/14/2024 1:53 PM	File folder

- o

II. Pokedex

- pokedex.json:
    - o Json file to store all pokemon's information.
    - o How to execute: Double click to run the **pokedexCrawler.exe.** Check the podex.json for result.

📁 client	6/14/2024 1:53 PM
📁 pkg	6/14/2024 10:20 AM
⚙️ .gitattributes	6/10/2024 2:52 PM
🔵 go	6/14/2024 10:21 AM
📄 go.sum	6/11/2024 3:07 PM
{} player	6/14/2024 2:02 PM
{} pokedex	6/11/2024 11:24 PM
🔲 pokedexCrawler	6/14/2024 7:14 PM
pokedexCrawler	6/11/2024 11:23 PM

    - o Crawled from pokemondb.net using **pokedexCrawler.go.** Below is the database structure:

```json
[
  {
    "id": 0,
    "name": "Bulbasaur",
    "type": [
      "Grass",
      "Poison"
    ],
    "base_exp": 64,
    "speed": 45,
    "attack": 49,
    "defense": 49,
    "special_atk": 65,
    "special_def": 65,
    "hp": 45,
    "ev": 1
  },
  {
    "id": 0,
    "name": "Ivysaur",
    "type": [
      "Grass",
      "Poison"
    ],
    "base_exp": 142,
    "speed": 60,
    "attack": 62,
    "defense": 63,
    "special_atk": 80,
    "special_def": 80,
    "hp": 60,
    "ev": 1
  },
```

- player.json:
  - Json file to store the players list and their captured pokemons.
  - Each player will have a unique id, and their pokemon will have addition fields (current exp and level) in comparison with pokedex. There is X and Y field used as the blueprint for the pokemon struct when spawning for the game Pokecat. Below is the database structure

```json
[
  {
    "id": 1,
    "name": "Red",
    "pokemon_list": [
      {
        "id": 1,
        "name": "Pikachu",
        "type": [
          "Electric"
        ],
        "base_exp": 112,
        "speed": 120,
        "attack": 80,
        "defense": 50,
        "special_atk": 75,
        "special_def": 60,
        "hp": 45,
        "ev": 2,
        "current_exp": 112,
        "level": 1,
        "SpawnTime": "0001-01-01T00:00:00Z",
        "Coord": {
          "X": 0,
          "Y": 0
        }
      },
```

III. Pokebat
a. Sequence Diagram:
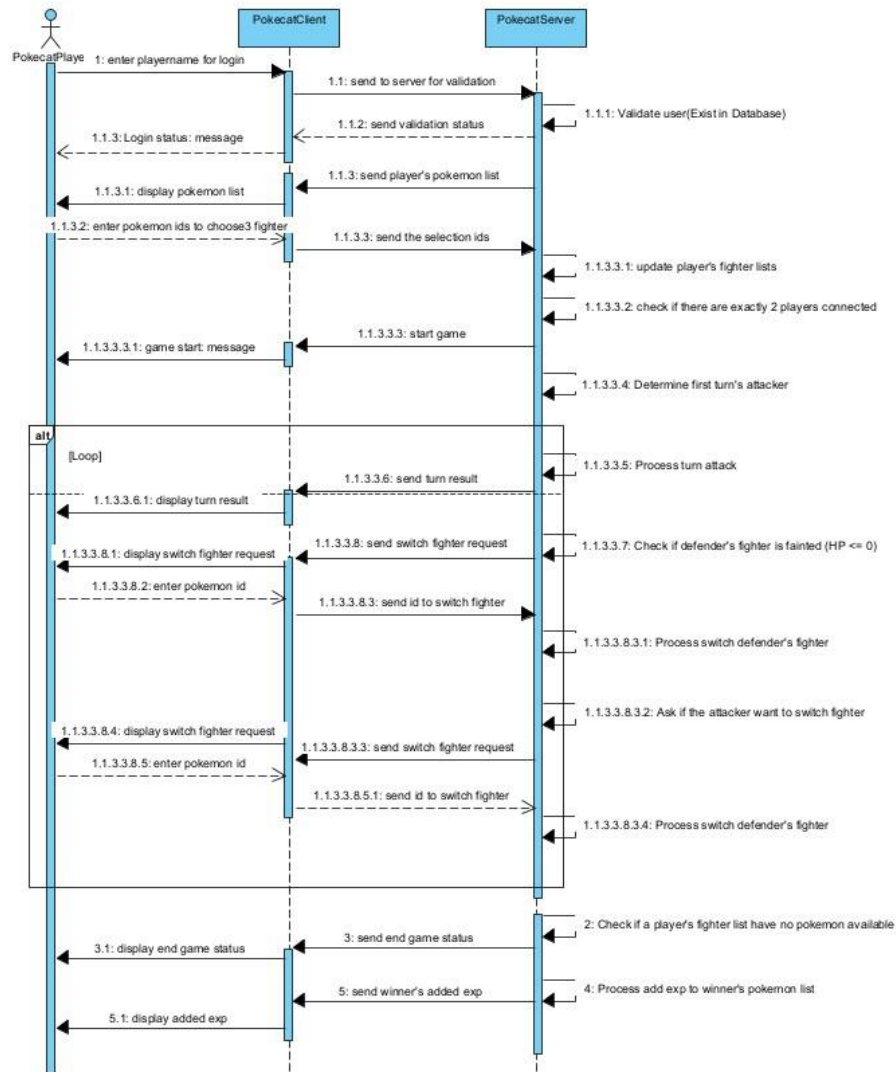
b. Gameplay
- o User will be ask to enter the username for login, no password required.
- o The system will display all the pokemons in their list and ask them to pick 3 fighters from the list.
- o After 2 players connected and finish to choose their fighter, the battle will start

```
Enter your username: Red
Server response: SUCCESS: You have registered as Red
Welcome Red!
Welcome to the Pokemon Battle Server!
Player: Red
1. Name: Pikachu | Type: [Electric] | Base Exp: 112 |HP: 45 | EV: 2.0 | Level: 1 | Current Exp: 112
Speed: 120 | Attack: 80 | Defense: 50 | Special Atk: 75 | Special Def: 60
2. Name: Bulbasaur | Type: [Grass Poison] | Base Exp: 64 |HP: 45 | EV: 1.0 | Level: 1 | Current Exp: 64
Speed: 45 | Attack: 49 | Defense: 49 | Special Atk: 65 | Special Def: 65
3. Name: Squirtle | Type: [Water] | Base Exp: 63 |HP: 44 | EV: 1.0 | Level: 1 | Current Exp: 63
Speed: 43 | Attack: 48 | Defense: 65 | Special Atk: 50 | Special Def: 64
4. Name: Pidgeot | Type: [Normal Flying] | Base Exp: 261 |HP: 83 | EV: 3.0 | Level: 1 | Current Exp: 261
Speed: 121 | Attack: 80 | Defense: 80 | Special Atk: 135 | Special Def: 80
Choose 3 Pokémon (enter the pokemon ids separated by spaces):
1 2 3
SUCCESS: You have registered as Red
Two players connected. Starting the battle!
```

- o System will print out a turn information and result for both the attacker and the defender

```
-----------------------
Turn 1, attacker Red:
Attacking:
1. Name: Pikachu | Type: [Electric] | Base Exp: 112 |HP: 45 | E
V: 2.0 | Level: 1 | Current Exp: 112
Speed: 120 | Attack: 80 | Defense: 50 | Special Atk: 75 | Speci
al Def: 60
Defending:
1. Name: Charmander | Type: [Fire] | Base Exp: 62 |HP: 39 | EV:
 1.0 | Level: 1 | Current Exp: 62
Speed: 65 | Attack: 52 | Defense: 43 | Special Atk: 60 | Specia
l Def: 50
Pikachu used a normal attack!
-----------------------
Damage dealt: 37
Charmander's HP: 2
```

- o After an attack, the attacker will be asked if they want to change their fighter

```
Blue, do you want to switch your fighter? (Y/N)

Y
1. Name: Charmander | Type: [Fire] | Base Exp: 62 |HP: 2 | EV:
1.0 | Level: 1 | Current Exp: 62
Speed: 65 | Attack: 52 | Defense: 43 | Special Atk: 60 | Specia
l Def: 50
2. Name: Pidgey | Type: [Normal Flying] | Base Exp: 50 |HP: 40
| EV: 1.0 | Level: 1 | Current Exp: 50
Speed: 56 | Attack: 45 | Defense: 40 | Special Atk: 35 | Specia
l Def: 35
3. Name: Caterpie | Type: [Bug] | Base Exp: 39 |HP: 45 | EV: 1.
0 | Level: 1 | Current Exp: 39
Speed: 45 | Attack: 30 | Defense: 35 | Special Atk: 20 | Specia
l Def: 20
Select your fighter by ID:
```

- o If a fighter are out of HP, the player have to switch their fighter. The game will end if one of the two playes have no available fighter left. The winner's pokemons will have bonus exp.

```
------------------------
Blue's Charmander fainted!
, you have to switch your fighter!
2. Name: Pidgey | Type: [Normal Flying] | Base Exp: 50 |HP: 40
| EV: 1.0 | Level: 1 | Current Exp: 50
Speed: 56 | Attack: 45 | Defense: 40 | Special Atk: 35 | Specia
l Def: 35
3. Name: Caterpie | Type: [Bug] | Base Exp: 39 |HP: 45 | EV: 1.
0 | Level: 1 | Current Exp: 39
Speed: 45 | Attack: 30 | Defense: 35 | Special Atk: 20 | Specia
l Def: 20
Select your fighter by ID:
```
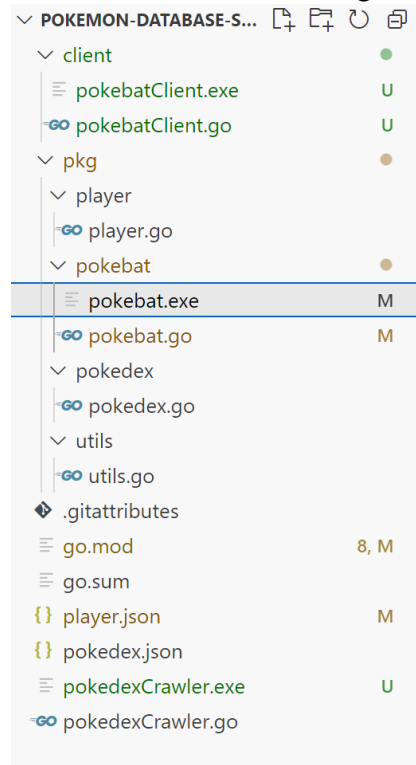
```
Turn result:
3. Name: Caterpie | Type: [Bug] | Base Exp: 39 |HP: 0 | EV: 1.0
 | Level: 1 | Current Exp: 39
Speed: 45 | Attack: 30 | Defense: 35 | Special Atk: 20 | Specia
l Def: 20
------------------------
------------------------
The opponent's fighter is fainted!, wait for them to switch the
 fighter!
Each pokemon of Red will have 16 bonus exp!
You win!
Battle ended!
```

c. How to run

- o Run the **pokebat.exe** in the **pkg/pokebat** folder to start the server. Then run the **pokebatClient.exe** in the **client** folder twice to create 2 clients and start observing the gameplay.

```
∨ POKEMON-DATABASE-S...
  ∨ client                          ●
    ≡ pokebatClient.exe             U
    GO pokebatClient.go             U
  ∨ pkg                             ●
    ∨ player
      GO player.go
    ∨ pokebat                       ●
      ≡ pokebat.exe                 M
      GO pokebat.go                 M
    ∨ pokedex
      GO pokedex.go
    ∨ utils
      GO utils.go
  ◆ .gitattributes
  ≡ go.mod                        8, M
  ≡ go.sum
  {} player.json                    M
  {} pokedex.json
  ≡ pokedexCrawler.exe              U
  GO pokedexCrawler.go
```

IV. Pokecat
a. Sequence Diagram
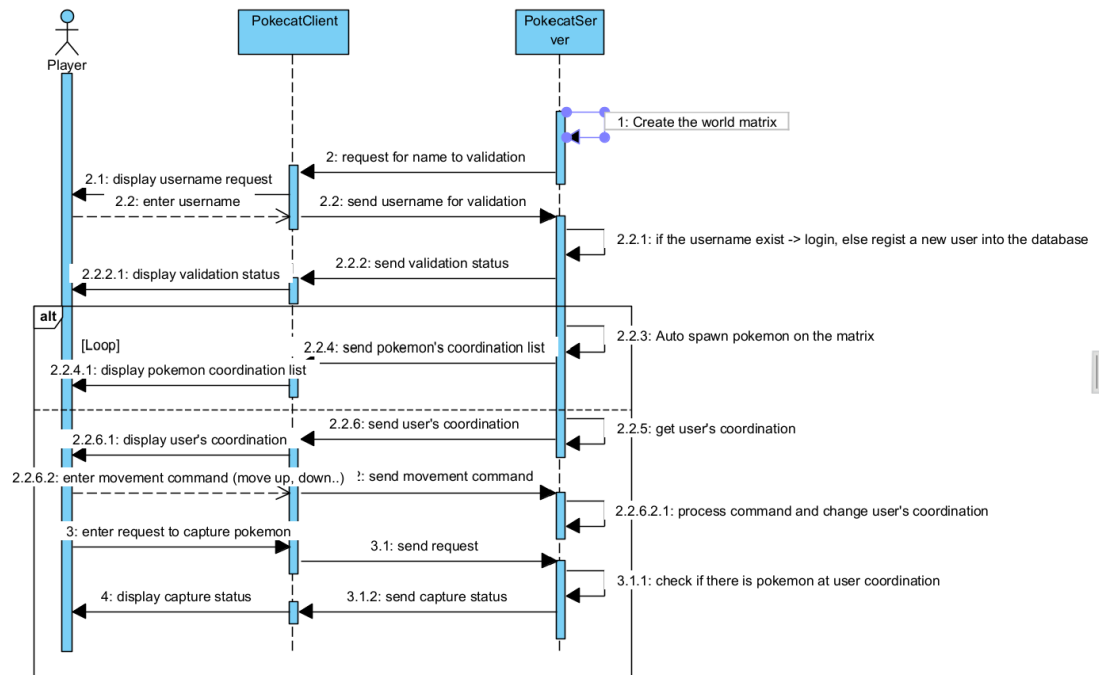
b. Gameplay
- o User will be asked to enter their username. If the username exists in the database, the system will retrieve their information, otherwise it will register them as a new player and store in the database
- o The system will spawn the pokemons and display the pokemon list which their coordination.

```
Players loaded: 3
Pokemons loaded: 559
Spawned pokemon: Voltorb at 1 0
Spawned pokemon: Politoed at 7 3
Spawned pokemon: Charizard at 5 8
Spawned pokemon: Crobat at 0 2
Spawned pokemon: Ledian at 5 7
Spawned pokemon: Farfetch'd at 8 2
Spawned pokemon: Jigglypuff at 7 4
Spawned pokemon: Beedrill at 5 5
Spawned pokemon: Noctowl at 2 3
Spawned pokemon: Machop at 3 6
Server started. Listening on :8080
Enter 'exit' to stop the server.
Pokemons saved: 569
Client connected.
Players saved: 4
New player joined: Alex
```

o The system will also display to the player their current coordination and the number of pokemon in their list.

```
Enter your name to register or login: Alex
Enter a command:
Enter your name to register or login:

Enter a command:
Player: Alex
Coordinates: (8, 0)
Pokemons: 0/200
```

o User can enter these commands:
- move + direction: moving around
- capture: to catch the pokemon at their current location. If at the position have no pokemon (or they run away after being respawned), a message of catching failed will be displayed, otherwise the user's pokemon count will increase to indicate they have captured one.
- show pokemons: display their captured pokemons list.
- exit: save their data to the database and exit the game

```go
switch cmd {
case "move up":
    movePlayer(player, player.CurrentCoord.X, player.CurrentCoord.Y+1)
case "move down":
    movePlayer(player, player.CurrentCoord.X, player.CurrentCoord.Y-1)
case "move left":
    movePlayer(player, player.CurrentCoord.X-1, player.CurrentCoord.Y)
case "move right":
    movePlayer(player, player.CurrentCoord.X+1, player.CurrentCoord.Y)
case "capture":
    capturePokemon(player)
case "show pokemons":
    showPokemons(conn, player)
case "exit":
    fmt.Println("Player", player.Name, "exited.")
    return
default:
    fmt.Println("Unknown command from player", player.Name)
}
```

```
move down
Enter a command:
Player: Alex
Coordinates: (8, 2)
Pokemons: 1/200

move down
Enter a command:
Player: Alex
Coordinates: (8, 1)
Pokemons: 1/200

capture
Enter a command:
Player: Alex
Coordinates: (8, 1)
Pokemons: 2/200

show pokemons
Enter a command:
Captured Pokemons:
ID: 156, Name: Onix,
ID: 178, Name: Cloyster,
```

c. How to run
- First run the **server.exe** in the **server** folder to start the server and observe the spawned pokemon list, then run the **pokecatClient.exe** in the **client** folder to start catching.

```
∨ POKEMON-DATABASE-S...
  ∨ client                          ●
      pokecatClient.exe             U
   GO pokecatClient.go              U
  ∨ server                          ●
      {} player.json                U
      {} pokedex.json               U
       server.exe                   U
    GO server.go                  2, U
    ◆ .gitattributes
       go.mod                     8, M
       go.sum
       pokedexCrawler.exe           U
    GO pokedexCrawler.go
```