Pokemon Battle Game - Coroutines Project

Student Name: Pradnyesh More
Course: Programming Languages
Assignment: Coroutine-Based Project

Project Description

This project is a simple turn-based Pokemon battle game that demonstrates coroutines in Python. The game shows how coroutines can pause and resume execution to create smooth turn-based gameplay.

What Are Coroutines?

Based on our class notes, coroutines are special functions that:

1. Can pause in the middle of execution using yield
2. Can resume exactly where they left off
3. Remember their state between pauses
4. Cooperate with other coroutines by taking turns

How This Game Uses Coroutines

Two Main Coroutines:

- player_turn() - Handles the player's actions
- enemy_turn() - Handles the enemy AI's actions

When a coroutine hits a yield statement:

- It pauses execution
- Saves all its variables and position
- Gives control back to the main game loop

When we call next() on the coroutine:

- It resumes right after the yield
- Remembers all its variables
- Continues until the next yield

Game Features

Player Actions:

- Attack: Deal damage to enemy Pokemon
- Heal: Restore 20 HP

Enemy AI:

- Smart strategy: Heals when HP is below 30
- Otherwise attacks: Simple but effective

Battle Flow:

1. Show current HP status
2. Player chooses action (coroutine runs until yield)
3. Enemy takes action (coroutine runs until yield)
4. Repeat until someone wins

Why Coroutines Are Perfect for Turn-Based Games

Without Coroutines:

- Need complex state tracking variables
- Hard to pause in middle of a turn
- Messy if/else logic for game states

With Coroutines:

- Natural pause points with yield
- Automatic state preservation
- Clean, readable code that matches game flow

What I Learned

1. How to create coroutines using generator functions with yield
2. How next() resumes coroutines where they left off
3. How coroutines preserve state between calls
4. Why coroutines are useful for turn-based applications
5. How to combine coroutines with OOP for clean code structure

Sample Output

```
Battle starts: Pikachu vs Charmander

--- Turn 1 ---
Your Pikachu: 100 HP
Enemy Charmander: 90 HP

Pikachu's turn!
1. Attack
2. Heal
Pick 1 or 2: 1
Pikachu hits for 29 damage!
Press Enter for enemy turn...

Charmander's turn!
Charmander hits for 31 damage!
Press Enter for next turn...

--- Turn 2 ---
Your Pikachu: 69 HP
Enemy Charmander: 61 HP

Pikachu's turn!
1. Attack
2. Heal
Pick 1 or 2: 1
Pikachu hits for 29 damage!
Press Enter for enemy turn...

Charmander's turn!
Charmander hits for 27 damage!
Press Enter for next turn...
```

```
--- Turn 3 ---
Your Pikachu: 42 HP
Enemy Charmander: 32 HP

Pikachu's turn!
1. Attack
2. Heal
Pick 1 or 2: 1
Pikachu hits for 22 damage!
Press Enter for enemy turn...

Charmander's turn!
Charmander heals 15 HP!
Press Enter for next turn...

--- Turn 4 ---
Your Pikachu: 42 HP
Enemy Charmander: 25 HP

Pikachu's turn!
1. Attack
2. Heal
Pick 1 or 2: 1
Pikachu hits for 30 damage!
Charmander is knocked out!

=========================
YOU WIN!
=========================
```