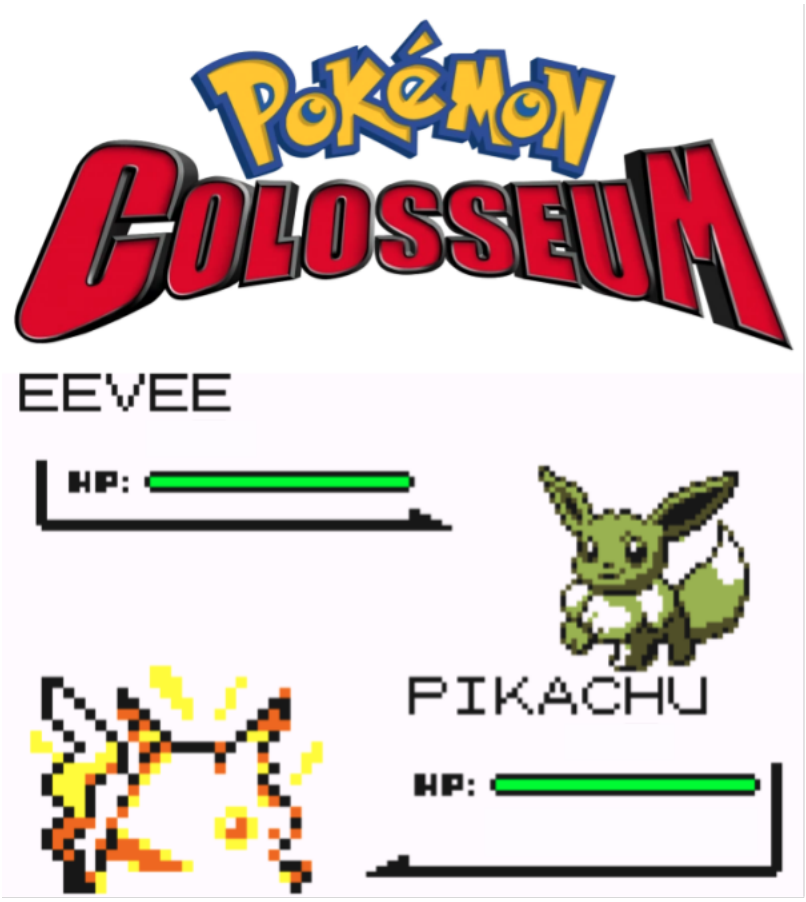
CAP4630 Project 1 - Pokemon Colosseum

Due Date: Sunday, 2/5/2023 11:59 PM



In this individual project, you are going to write in Python to implement a command-line based game *Pokemon Colosseum* to defeat Team Rocket and restore peace to the world of Pokemon. Here we are in the Indigo League and we have 82 Pokemon of five types: **Normal**, **Fire**, **Water**, **Electric**, and **Grass**. Information about these Pocket Monsters can be found in Pokemon.csv, where we will find their names, types, hit points, attack, defense, height, weight, and moves that are available in the Colosseum. Each move has a name, type, power, etc. that can be found in moves.csv. Below are the game rules.

In the Colosseum, each of Team Player and Team Rocket will be allocated at random three Pokemon to start the battle. No duplicate Pokemon shows up in both teams or any one team. The order of the Pokemon entering the battle will be randomly chosen and fixed. To start the battle, a random coin toss to decide who starts to make the first move. Hereafter, the rest of the battle alternates moves between Team Player and Team Rocket, until one team's Pokemon all fainted at which point the other team claims the victory. Each move from an attacking Pokemon will cause a damage to the defending Pokemon's HP. The formula to compute such damage is below. If at any time a Pokemon's HP becomes less than or equal to zero, that

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Pokemon faints to its poke ball and will not return to battle, and the Pokemon next in line, if any, will enter to make a move resuming the battle.

The following Type Matchup Table is needed for the damage formula:

Attack\Defend	Normal	Fire	Water	Electric	Grass
Normal	1	1	1	1	1
Fire	1	0.5	0.5	1	2
Water	1	2	0.5	1	0.5
Electric	1	1	2	0.5	0.5
Grass	1	0.5	2	1	0.5
Other	1	1	1	1	1

Now, when Pokemon A makes a move M on Pokemon B, use the following formula to calculate the damage A does on B.

$$Damage(M, A, B) = P(M) * \frac{A(A)}{D(B)} * STAB * TE(M, B) * Random$$

P(M) is the power of move M, A(A) is the attack of Pokemon A, D(B) is the defense of Pokemon B, STAB is the same type attack bonus, TE(M, B) is the type efficiency of A's move M to defender B, and Random is a random value between 0.5 and 1. More specifically, P(M) can be found in moves.csv, and A(A) and D(B) in Pokemon.csv. STAB will be 1 unless A uses a move whose type matches A's type, in which case this value will become 1.5. TE(M, B) can be found in the above Type Matchup Table, e.g., if A's move M is of type Water and B's type is Fire, then TE(M, B) will set to 2. If the calculated damage is not an integer, it will be rounded up.

One example: say Pikachu makes 'Thunder Shock' to Exeggutor. Then Damage('Thunder Shock', Pikachu, Exeggutor) = 40*55/85*1.5*0.5*0.8 = 16, assuming Random came to be 0.8.

This damage formula is an adaptation of the one found in Pokemon Encyclopedia at https://bulbapedia.bulbagarden.net/wiki/Damage.

Implementation Requirements:

1. Your submission should contain at least PokemonColosseum.py and Pokemon.py. PokemonColosseum.py will contain the main module for running the game, and Pokemon.py will contain a Pokemon class that has the **necessary properties** about a Pokemon in order to carry out the game. These necessary properties include name, type, HP, attack, defense, moves, and properties of moves. The last part of the which may be extracted to form its own class. That said, feel free to have more .py files or Python classes as needed.

2. The two teams, Team Rocket and Team Player, each has three randomly assigned Pokemon to play the game. Use a **queue** data structure to keep track of Pokemon per each team during the game play. This queue data structure can be as simple as a list that is first-in-first-out using append and pop built-in methods.
3. When it is time for Team Rocket's Pokemon to make a move, a random move in its available moves will be made. However, when for Team Player, a **menu of available moves** will be presented to the player to select from. Note here "available moves" mean the moves that the Pokemon has according to moves.csv that have not been used in the game. That said, a move of a Pokemon cannot be reused until it has used all the moves, at which point all moves are available again.
4. An example output is provided below. There is room for creativity, but the general game flow should be alike. The rules of this game are described above and should be followed as is.
5. The game play should be **reasonably robust** to bad user inputs. When the player chooses a move, the program should make sure the choice is a valid option ensuring it is not, e.g., a non-integer or a move that already was used in battle.
6. **Deliverables** in the zip file should include all Python program (.py) files, all provided csv files, and a README file that describe how to run your program. I will use Python 3.11 to run your submissions. If there is any package that your program installs and imports, make sure to include such information in the README. If you created and used virtual environment, it should be included in the submission as well.
7. After completion, the zip file should be submitted onto Canvas by the due time. **Late project policy** is as detailed in syllabus.
8. Submissions will be checked for peer similarity for **academic integrity**. In case of violation, the minimum penalty will be a zero on the project and a misconduct report.

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Example Output:

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Welcome to Pokemon Colosseum!

Enter Player Name: Professor

Team Rocket enters with Exeggutor, Meowth, and Seel.

Team Professor enters with Pikachu, Charizard, and Bulbassaur.

Let the battle begin!
Coin toss goes to ----- Team Rocket to start the attack!

Team Rocket's Exeggutor cast 'Barrage' to Pikachu:
Damage to Pikachu is 25 points.
Now Exeggutor has 95 HP, and Pikachu has 10 HP.

Choose the move for Pikachu:
1. Mega Punch
2. Thunder Punch
3. Thunder Shock
4. Slam
5. Dig

Team Professor's choice: 3

Pikachu cast 'Thunder Shock' to Exeggutor:
Damage to Exeggutor is 16 points.
Now Exeggutor has 79 HP, and Pikachu has 10 HP.

Team Rocket's Exeggutor cast 'Solar Beam' to Pikachu:
Damage to Pikachu is 200 points.
Now Exeggutor has 79 HP, and Pikachu faints back to poke ball.

Next for Team Professor, Charizard enters battle!

Choose the move for Charizard:
1. Mega Punch
2. Ember
3. Thunder Punch
4. Solar Beam
5. Hyper Beam

Team Professor's choice: 5

Charizard cast 'Hyper Beam' to Exeggutor:
Damage to Exeggutor is 178 points.
Now Exeggutor faints back to poke ball, and Charizard has 78 HP.

Next for Team Rocket, Meowth enters battle!

Team Rocket's Meowth cast 'Thunderbolt' to Charizard:
Damage to Charizard is 47 points.
Now Meowth has 40 HP, and Charizard has 31 HP.

Choose the move for Charizard:
1. Mega Punch
2. Ember
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3. Thunder Punch
4. Solar Beam
5. Hyper Beam (N/A)

Team Professor's choice: 1

Charizard cast 'Mega Punch' to Meowth:
Damage to Meowth is 115 points.
Now Meowth faints back to poke ball, and Charizard has 31 HP.

Next for Team Rocket, Seel enters battle!

Team Rocket's Seel cast 'Blizzard' to Charizard:
Damage to Charizard is 77 points.
Now Seel has 65 HP, and Charizard faints back to poke ball.

Next for Team Professor, Bulbassaur enters battle!

Choose the move for Bulbassaur:
1. Vine Whip
2. Mud'Slap
3. Solar Beam
4. Rage
5. Sludge

Team Professor's choice: 1

Bulbassaur cast 'Vine Whip' to Seel:
Damage to Seel is 85 points.
Now Seel faints back to poke ball, and Bulbassaur has 45 HP.

All of Team Rocket's Pokemon fainted, and Team Professor prevails!
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