Battle Field – Survival of the fittest

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Battlefield is a single/multiplayer python command-line game. Game is available in 2 Formats:

- Basic Version
- Extended Version (Upgrades available)

In Basic version of the game, Users are given 10 dollars and asked to build an army comprising soldiers, archers or knights. Users can spend as much or little of their money. Each unit has a weakness and a strength. Archers are good against Soldiers but are terrible against Knights. Soldiers are good against Knights but can't win against Archers. Knights beat Archers, but fall short against Soldiers. If a unit comes up against a unit of the same type, both lose.

Fighter	Strength	Weakness
Archer	Soldier	Knight
Soldier	Knight	Archers
Knight	Archer	Soldier

In Extended version, two upgrades have been added to the basic version. As per the User's convenience, upgrade can be chosen among Medics, Expanded Armies or both.

Upgrade option 1 - Medics

Rules and Assumptions:
- Money left after purchasing of the army is automatically added as medics money.
- While battle is going on, if a fighter is defeated and the player has medics money pending, the fighter can re-enter the army from last and medics money is reduced.
- Once medics money is finished, the defeated fighter cannot re-enter the army again

Upgrade option 2 – Expanded Armies

Two more fighters are added in menu for the users to choose from. These two are :

1. Siege Command
2. Wizard

Siege equipment wins against everyone except knights and Wizard
Wizard can beat anything, but they can't defeat Archers

Fighter	Strength	Weakness
Siege Equipment	Archers, Soldiers	Knights, Wizards
Wizard	Soldier, Siege,Command,Knights	Archers

Rules and Assumptions:
- Cost of purchasing a Siege Equipment is 2 dollars, which is 2 times the cost of purchasing a Soldier, Archer or Knight
- Cost of purchasing a Wizard is 3 dollars which is the highest among tha fighters
- You will not be able to purchase any of the above if your budget is 2 dollars. In that case, the user needs to consider Knight, Archer or Soldier.

Upgrade option 3 – Both

In Option 3, the user can select both upgrades, which will work together

Rules and Assumptions:
- For upgrade 3, individual rules of upgrade 1(Medics) and 2(Extended Armies) will be applicable.
- If a Siege is defeated and medics amount is present for the player, he can be taken back in the army with just $1, even if the cost of purchase was $2. This is because the medication cost will be same for all the fighters
- Similarly if Wizard is defeated and medics amount is present for the player, he can be taken back in the army pool with just $1

Note: All the rules and assumptions will be followed by the Bot army also

Game Play

Basics version:

- In first menu option, the user is asked to select between Single Player or Multi Player. In Multiplayer option, User has to create two armies. In Single Player option, User has to create only single army and the other one will be auto-generated using random function.

```
-------------------------------------------------------------------------
***** Welcome to Ultimate Combat — Survival of the fittest ************
                      Basic Version — V 1
-------------------------------------------------------------------------
Menu:
Game mode option press
 1 — Multi player
 2 — Single player
```

- Second option is the recruitment option, where all the fighters are listed. User can select any or no fighter. User can select till a count of 10 or till he presses '0'. With each selection the complete army members(bought) are listed.

```
    ------------------------------------------------
    Player 1 choose your army
    Choose your option from 0,1,2,3
    1 — Archer     —      $1
    2 — Soldier    —      $1
    3 — Knight     —      $1
    0 — Done with the selection
```

```
3
You bought a Knight
Your team as of now ['Archer', 'Soldier', 'Knight', 'Archer', 'Knight']
Your budget is over
Player 1 team is ready ['Archer', 'Soldier', 'Knight', 'Archer', 'Knight']
```

- For each selection of the fighter, User selection is displayed, current army of the player is displayed and budget left is displayed. If the user budge is finished, a notification also pops saying "Your budget is over".

```
v
Please enter a digit from 0, 1, 2 and 3

Please enter a digit from 0, 1, 2 and 3
o
Please enter a digit from 0, 1, 2 and 3
```

- If the User enters any character which is not present in the options, a notification pops saying "Please enter a digit from 0,1,2 and 3" (in example scenario), and the game will continue expecting a valid input from the user.

- For Multiplayer option, the recruitment process starts again for army 2

```
_____
Player 2 choose your army
Choose your option from 0,1,2,3
1 - Archer      -       $1
2 - Soldier     -       $1
3 - Knight      -       $1
0 - Done with the selection
```

- Once both the teams are ready, fight starts and each of the fighter comes face to face. Result of face to face is also listed and the winner is announced every time along with the left out army for both the teams.

```
 > Battle is between Knight and Soldier
Knight died from Player1
fighters still on field ['Archer', 'Knight'] from Player1 and ['Soldier', 'Knight'] from Player2
_____
```

- If any army is defeated completely, the other player is declared as winner. Or else if both the armies are defeated, it is declared as a tie

```
 > Battle is between Knight and Knight
both Knight eliminated
fighters still on field [] from Player1 and [] from Player2
_____
_____
>>>>>>> The battle was a tie <<<<<<<<<<<
_____
```

- Game ends

Extended Version:

- In extended version, the first option is to choose the upgrade the user wants to add.
User can select between Medics, Expanded Armies or both.

```
-----------------------------------------------------------------
******* Welcome to Ultimate Combat — Survival of the Smartest ********
-------------------------------Version 2.0-------------------------------

Upgrades are available for this version of Battle. Choose your option
 1 — Medics
 2 — Expanded Armies
 3 — Choose both
```

- Second option is game mode : Single Player or Multiplayer option which is same as
that in basic game.

- If the user has selected upgrade option as "Expanded Armies" or "Both", The list of
fighters will also have "Siege equipment" and "Wizard" which will not be displayed in
the "Medics" only option.

```
-----------------------------------------------------------------
Player 1 choose your army
Choose your option from 0,1,2,3,4,5. Warning: Siege equipment and wizard are costly
1 — Archer        —      $1
2 — Soldier       —      $1
3 — Knight        —      $1
4 — Siege Equipment — $2
5 — Wizard        —      $3
0 — Done with the selection
```

- Siege equipment and Wizard have different costs and they are costlier than usual
fighters because of their special powers.Once both the armies are setup, the battle starts.

- If "Medics" or "Both" upgrades are enabled, the user can see the pending medics
money available after each one on one face off. The defeated fighter re-enters the army from
the end when medics money is available with the player.

```
 > Battle is between Soldier and Soldier
both Soldier eliminated
Medics used : Soldier re-entered the army. Medics left for player 1 is 1
Medics used : Soldier re-entered the army. Medics left for player 2 is 0
fighters still on field ['Knight', 'Archer', 'Soldier'] from Player1 and ['Wizard', 'Soldier'] from Player2
-----------------------------------------------------------------
```

- If any army is defeated completely, the other player is declared as winner and game ends

Game Structure:

- Game is implemented in modular approach where most of the logic is implemented in functions. The game logic is divided in 3 files:

   A. basic_game_29567467.py

   B. extended_game_29567467.py

Apart from a few differences, functions in both the files are implementing the same logic. Basic logic for each functions are as follows

- **fighter_insertion** function is called multiple times to recruit the fighter for each army and fill it. In case of
  upgrade option, new fighters can also be added with 4 - siege equipment and 5 - wizard
  The function in turn calls insert function which maps fighter to the digit entered
  Arguments: None
  Return: The populated army list

- **game_play** function is called to run the battle, i.e it will check the two list values simultaneously and will pop out the dead fighter from the corresponding army. This function will also display the winner at the end of the battle
  Arguments: list1 - Player1 army list and list 2 - Player2 army list
  Return: none

- **player_initialization** function is called for Multi-player game format in which each fighter is purchased with an
  over-all budget of 10$ for each Player
  Arguments : No arguments are passed
  Return : No return value

- **create_random_army** function is called when the user selects "Single Player option"
  Random function is used to populate the bot army which will represent Player-2
  Arguments: None
  Returns: None

- **single_player_multi_player** function is a part of menu in which u have an option between single player or multiplayer battle
  Arguments: None
  Returns : None

C. common_functions_29567467.py

These functions are common which are called in both the files.

- **insert function** maps user entered digits to fighter strings and appends that to the army list.
  Arguments: the fighter digit entered by the user and list as of now
  Return: the function returns the list after the newly recruited fighter is appended to it.

- **fighter_count_notification** notifies the Player the pending budget each time a fighter is recruited
  Arguments: Count of pending fighters which was computed in a while loop of fighter_insertion function
  Return: None

- **team_length_check** function does an initial check if any/both of the army(s) is empty. In that case it will declare
  the other Player as the winner
  Argument: length of both the teams (int)
  return: will exit the battle in case length is 0.

- **one_on_one_battle** function is called to check the strength and weakness of each fighter with the other. This function
  will also decide and print who was the winner in individual battle
  arguments: fighter1 - single fighter from one army, fighter2 - single fighter from another army
  return: 0 - both fighters are eliminated
  1 - second fighter is eliminated
  2 - first fighter is eliminated

- The function **player_selection_menu** is called to list the available purchase options for each game level.
  For the upgrade version, it will also display newly added fighter list with cost
  Arguments: None
  Return : None

Game Scenarios:

Test cases checked for different scenarios: (Army size reduced to 5 for testing purpose)

Checking different inputs in Medics -> Multiplayer

1. Medics -> Multiplayer -> Both army 0 : Tie
2. Medics -> Multiplayer -> One army 0 : Other army wins
3. Medics -> Multiplayer -> Both army present
- [Archer, Soldier, Knight] [Soldier, Knight] : Player 1 wins
- [Soldier, Archer] [Archer, Knight, Knight] : player 1 wins
- [Archer][Soldier,Soldier] : Player1 wins
- [Soldier][Archer, Archer] : Player 2 wins
- [Archer, Soldier, Knight, Archer, Soldier][Archer, Solder, Knight, Archer, Soldier](Both army same) : Tie

Checking different inputs in Medics -> Single Player

1. [Soldier, Knight, Archer] and Player2 bot will be generated
Player 2 generated using random function : [Soldier, Archer, Archer, Soldier] and medics 1:
Player 2 wins
2. Player 1 empty [] and bot self generated [Knight, Soldier, Soldier] with medics 2:
Player 2 wins

Checking different inputs in Expanded Armies. Wizard for 3 dollars and Siege for 2 dollars

Expanded Armies -> Multiplayer
1. Both army empty: Match is a tie
2. One army empty: Other army wins
3. Both army present
- [Wizard, Archer, Archer][Siege, Archer, Soldier, Archer] : Tie
- [Wizard, Siege][Archer, Archer, Archer, Archer,Soldier] : Player 1 wins
- [Soldier, Soldier, Wizard][Soldier, Knight, Knight, Knight, Knight] : Player 1 wins

Expanded Armies -> Single Player
1. Player1 empty: Match is a tie, if bot amry is also not empty
Test:[][Knight, Soldier, Archer, Soldier, Archer]
2. Player1 present
- [Archer, Soldier, Soldier, Siege] [Soldier, Archer, Archer, Knight, Archer]: Player 2 wins
- [Soldier, Archer, Archer][Soldier, Soldier, Siege]: Player 2 wins

On choosing both the upgrades:

1. Multi-player:
- Both army empty: Match is a tie
- One army empty: Other Player wins
- Both army present:
[Wizard, Archer, Archer][Siege, Archer, Soldier, Archer] : Tie
[Wizard, Siege][Archer, Archer, Archer, Archer,Soldier] : Player 1 wins
[Soldier, Soldier, Wizard][Soldier, Knight, Knight, Knight, Knight] : Player 1 wins

2. Single-player:
- Player 1 empty – Match is a tie
- Player 1 army present and Player 2 is Auto generated
[Archer, Wizard][Wizard] : Player 1 wins
[Archer, Soldier, Knight, Siege][Knight, Wizard]: Player 2 won

Scope for Improvement:

- Once a fighter is selected, user should get the option to remove the fighter.
- Army size should be decided by the Player