FIT9133 Assignment #1

Building a Simple Combat Simulator with Python Programming

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1. Introduction

The main goal of this assignment was to build a simple combat simulator using python programming. The simple battle simulator is designed in such a way that one army pits against another.

This is a game to be played by 2 players. Initially at the start of the game each player have 10$ each. Each player is named as a Commander. Thus the two players could be named as “Commander 1” and “Commander 2”. These commanders initially have to form an army using this money. They can buy as much or as little units using this money. Each unit which they buy for their army in the standard game is 1$ each. The units are made to fight in the order they were purchased in.

There are 3 types of units available for the standard game:

1. Archer
2. Soldier
3. Knight

Each of these units have a weakness and a strength. Based on these weakness and strength there is a decision as to which army unit wins and which army unit looses the battle. The table which is given would help to analyse as to how the winning and loosing unit is chosen.

Type of Unit	Archer	Soldier	Knight
Archer	Tie	Archer	Knight
Soldier	Archer	Tie	Soldier
Knight	Knight	Soldier	Tie

Table 1: Outcomes of battles when units enter combat.

Now after the commanders make their army one unit out of the each army comes onto the battlefield. The units of the respective army fight and the loosing unit dies. The winning unit would remain on the battlefield. The commander who has lost his unit would send a new unit on the battlefield. The commander who would loose all his units is the loosing player.

There are two versions of the game.

1. The Basic Game
2. Extended Game

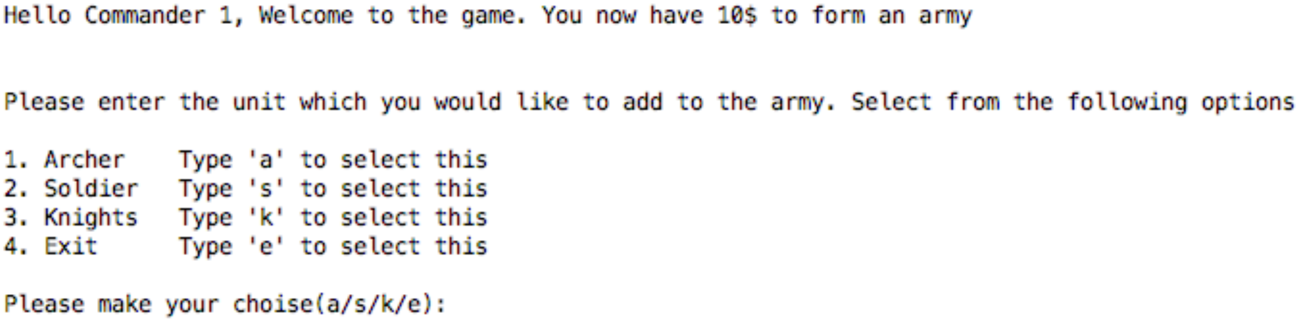
The basic version of the game is implemented as per the requirements of the game which is given in the Introduction of this document.

In the Extended version of the game we have added some extra features to the game. From the assignment question, the upgrade numbers 3 and 4 have been implemented in this game. Explanation of the upgrades and how to play the game are given in the next chapter.

2. How to play the game

2.1 Basic Game

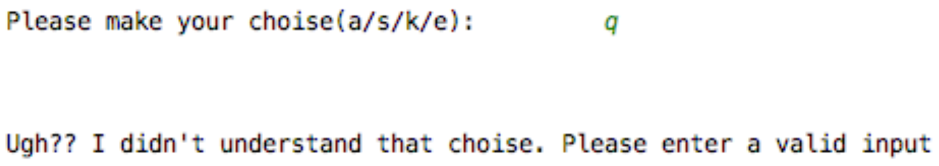
In the basic version of the game we have 2 players named commander 1 and commander 2. These players would have options to select from, to form an army. These options are the units which would be added to the army. After the 2 players make their selections, the units from each army are made to fight with each other. The winning army unit would remain on the battlefield. The commander who looses all his army units earliest, is the loosing player of this game.



```
Hello Commander 1, Welcome to the game. You now have 10$ to form an army


Please enter the unit which you would like to add to the army. Select from the following options

1. Archer    Type 'a' to select this
2. Soldier   Type 's' to select this
3. Knights   Type 'k' to select this
4. Exit      Type 'e' to select this

Please make your choise(a/s/k/e):
```

TAKING INPUT FROM PLAYERS

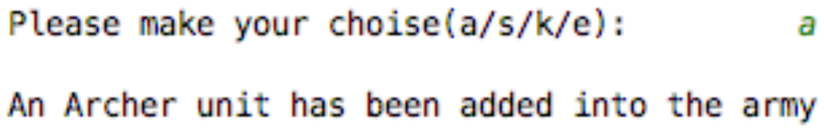
As seen when the basic game is run, the initial output would look something like the above screenshot. This is the input screen for player 1. The input has to be given by the player and could be one of the four specified options. As seen the player has to input ‘a’ to select Archer unit, ’s’ to select soldier unit, ‘k’ to select knight unit and ‘e’ to exit selection of units for the army.



```
Please make your choise(a/s/k/e):        q

Ugh?? I didn't understand that choise. Please enter a valid input
```

HANDLING INVALID INPUTS

As seen from the above screenshot if any invalid input is given, the user is prompted by an error message. Hence the player has to make a proper input selection from the given set of inputs which is ‘a’, ’s’, ‘k’ or ‘e’.



```
Please make your choise(a/s/k/e):        a

An Archer unit has been added into the army
```

SUCCESSFUL ADDITION OF A UNIT INTO THE ARMY

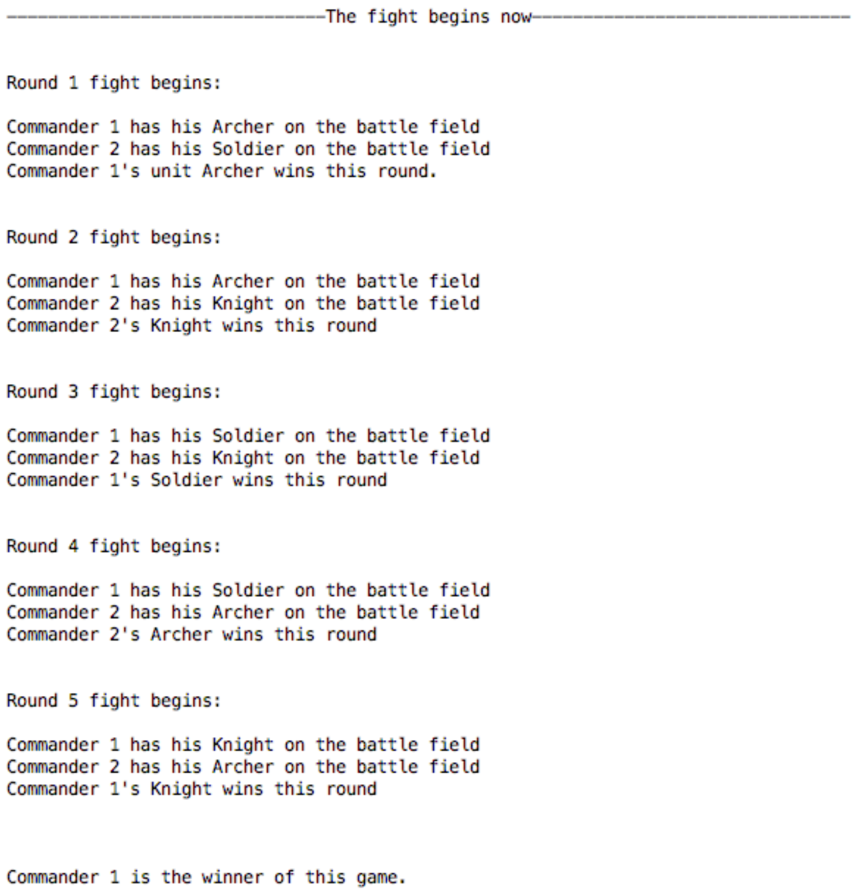
As seen from the above screenshot if a valid input is given then the specific unit would be added into the commander’s army and upon addition of the unit the player/commander would be notified, as to what unit was added into his army.

On selection of ‘e’ the unit selection for the commander’s army is done. Once the commander exits from the selection he cannot modify or upgrade his army again.

Similar to the screenshots shown above the input from the second player is taken. After input is taken from both the players, comparison of the army units is done, and the winning commander/player is decided.

Consider a case where the first player/commander has selected and Archer, Soldier and Knights unit for his army and the second commander has selected Soldier, Knights and Archer for his army. Now the output for this would look like this:

Input Case:
Commander 1: [Archer, Soldier, Knight]
Commander 2: [Soldier, Knight, Archer]



```
-------------------------------The fight begins now-------------------------------


Round 1 fight begins:

Commander 1 has his Archer on the battle field
Commander 2 has his Soldier on the battle field
Commander 1's unit Archer wins this round.


Round 2 fight begins:

Commander 1 has his Archer on the battle field
Commander 2 has his Knight on the battle field
Commander 2's Knight wins this round


Round 3 fight begins:

Commander 1 has his Soldier on the battle field
Commander 2 has his Knight on the battle field
Commander 1's Soldier wins this round


Round 4 fight begins:

Commander 1 has his Soldier on the battle field
Commander 2 has his Archer on the battle field
Commander 2's Archer wins this round


Round 5 fight begins:

Commander 1 has his Knight on the battle field
Commander 2 has his Archer on the battle field
Commander 1's Knight wins this round



Commander 1 is the winner of this game.
```

OUTPUT FOR A GIVEN CASE OF INPUT

As seen for the given input case where in the first commander selects Archer, Soldier and Knight units and the second commander selects Soldier, Knight and Archer units the output of the battle would be as the above screenshot. The output of each round will be shown for the respective inputs and after the battle the final winning commander would be displayed as the final output.

2.2 Extended Game

In the Extended game there are some upgrades which are done to the basic game. In the problem statement which is given as the assignment there are 4 upgrades which are given and out of these 4 upgrades, 2 upgrades have to be implemented in the solution. In this game the upgrade number 3 which is “Medics” and upgrade number 4 which is “Expanded Armies” have been implemented.

Explanation of the game upgrades are as follows:

1. Medics:

In the basic game each commander has the options to choose as much or as less units for his army. Say a commander starts his selection, he would have 10$ with him. However he could only purchase army units for 5$ and he would have 5$ left with him. Once the commander completes and exits from his selection he cannot use this 5$ again.

However in the extended game the medics upgrade has been implemented. Hence the left over money will be used to buy medics which is sold at 1$ per unit. One medics unit can save a army unit after it is defeated once. Thus as per the above case where the commander would purchase army units for 5$, would be left with 5$, thus automatically after the commander exits army units selection 5 medics would be added to him. Thus after a army unit is defeated on the battlefield the unit would be saved automatically and be added to his pool of army at the back. Each time this happens a medic unit would be reduced for the respective commander. Once the medics supplies are exhausted the commander will not be able to save any more units.

2. Expanded Armies:

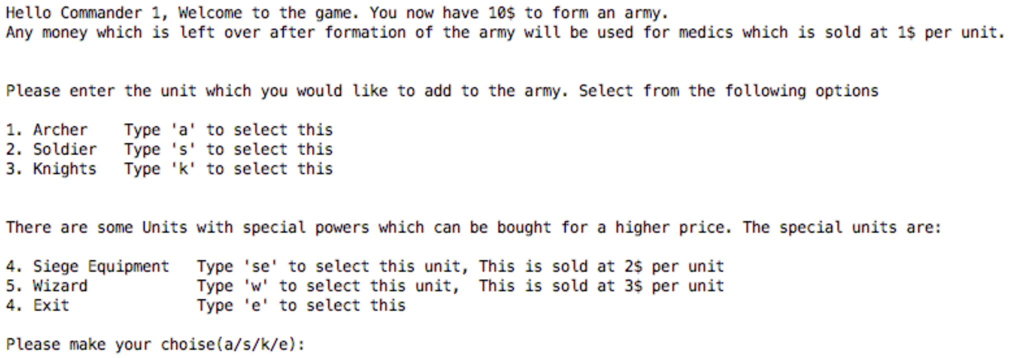
In case of Extended Armies there are 2 new special units the commander can choose from. These units have some more advantages compared to the normal units. However they are priced a little higher when compared to the basic game units.

The new units are:

- **Siege Equipment:** This unit would win against all other units however they loose the battle to knight and wizard units. The Siege Equipment unit can be bought by the commander in the extended game for 2$ per unit.

- **Wizard:** The Wizard unit could beat any other unit however on a battle against archer unit they would be defeated. The Wizard unit could be bought by the commander in the extended game for 3$ per unit.

In the Extended game similar to the Basic game battle happens between the army units of the commanders. In a similar fashion the army units are sent in an order and the winning unit would stay on the battlefield. The commander who looses all his army units at the earliest and has no money left would be considered as the loosing commander.

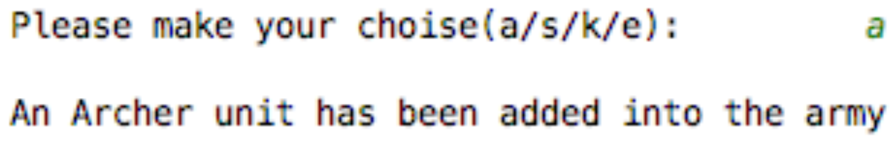


```
Hello Commander 1, Welcome to the game. You now have 10$ to form an army.
Any money which is left over after formation of the army will be used for medics which is sold at 1$ per unit.


Please enter the unit which you would like to add to the army. Select from the following options

1. Archer    Type 'a' to select this
2. Soldier   Type 's' to select this
3. Knights   Type 'k' to select this


There are some Units with special powers which can be bought for a higher price. The special units are:

4. Siege Equipment   Type 'se' to select this unit, This is sold at 2$ per unit
5. Wizard            Type 'w' to select this unit,  This is sold at 3$ per unit
4. Exit              Type 'e' to select this

Please make your choise(a/s/k/e):
```

EXTENDED GAME PLAYER INPUTS

On running the extended game code the initial output would look like shown in the screenshot above. As seen from the screenshot initially the player 1 is prompted for input. The player has options displayed to make selections of units for his army. As seen from the options the player can input ‘a’ for selection of Archer unit for the army, ’s’ for soldier unit and ‘k’ for knight unit. The commander in the extended game also has options for selection of some special units which have more advantages than the normal units. As seen from the screenshot the commander can input ‘se’ for selection of Siege Equipment unit and ‘w’ for selection of Wizard unit.

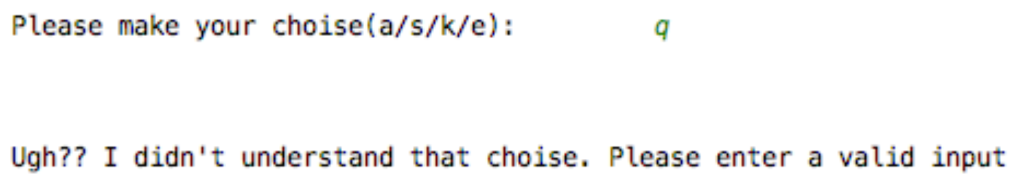
If the player would like to stop making selections of units for his army then the commander can input ‘e’ to exit. Please note that once the commander exits he would not be able to upgrade or make changes to his army and all the remaining money would be used for purchase of medics which is sold at 1$ per unit.



```
Please make your choise(a/s/k/e):        a

An Archer unit has been added into the army
```

SUCCESSFUL ADDITION OF UNIT TO THE ARMY

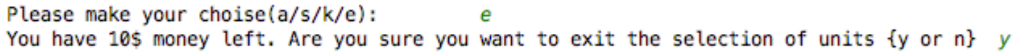
As seen from the above screenshot after the commander gives valid input to add a unit to his army, the unit would be added to the pool of army and the commander would be informed about the respective unit which was added into his army. As seen on selection of ‘a’ an Archer unit is added to the army and it is displayed to the commander.



```
Please make your choise(a/s/k/e):        q


Ugh?? I didn't understand that choise. Please enter a valid input
```

HANDLING INVALID INPUTS

If the player/commander enters an invalid input then a error message would be thrown to the player. Only for valid input selections, units would be added to the commanders army.



```
Please make your choise(a/s/k/e):        e
You have 10$ money left. Are you sure you want to exit the selection of units {y or n}  y
```

PLAYER EXITS FROM ARMY SELECTION

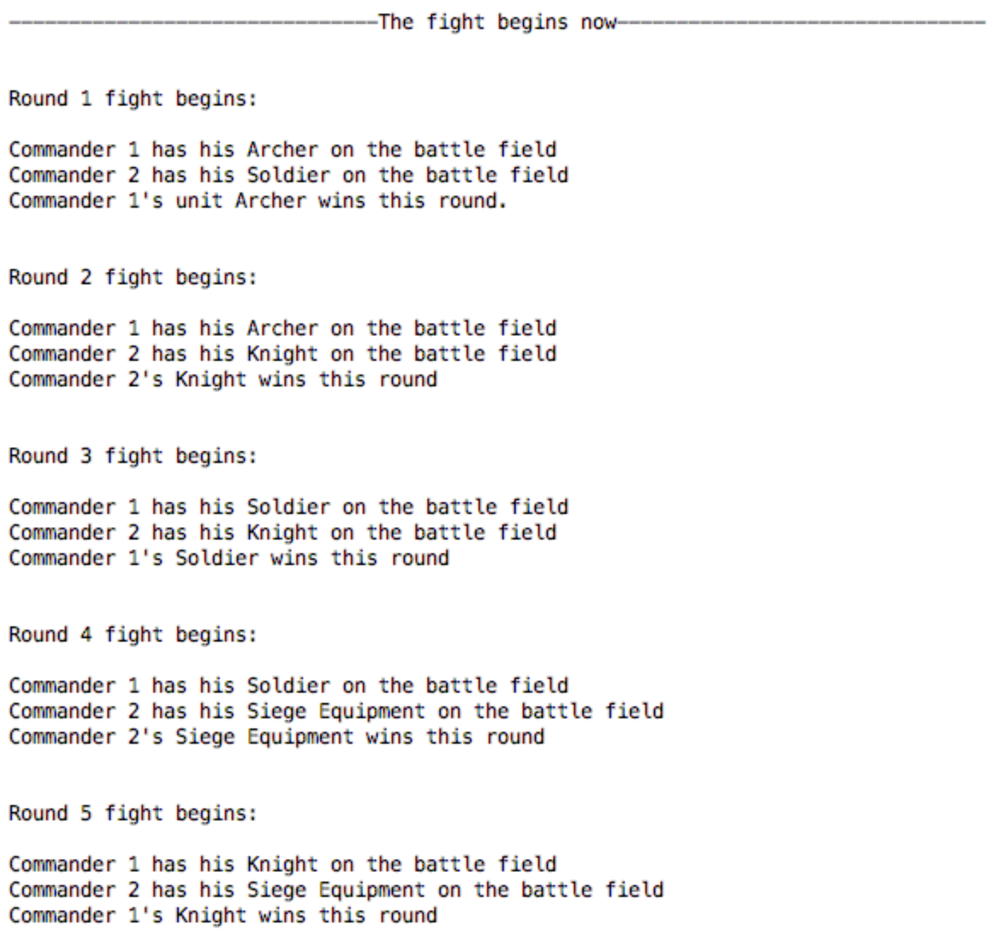
As seen from the above screenshot when a player would like to exit from selection of units for his army, there would be a prompt as to see weather the player would really like to exit and the remaining money of the commander would be displayed on the output.

Now let us take an input case where the commander 1 has selected his input to be Archer, Soldier, Knight, Siege Equipment, and wizard as his army and the commander 2 chooses Soldier, Knight, Siege Equipment, Wizard and Archer as his army. The output for this input case would be something like this.

Input case:

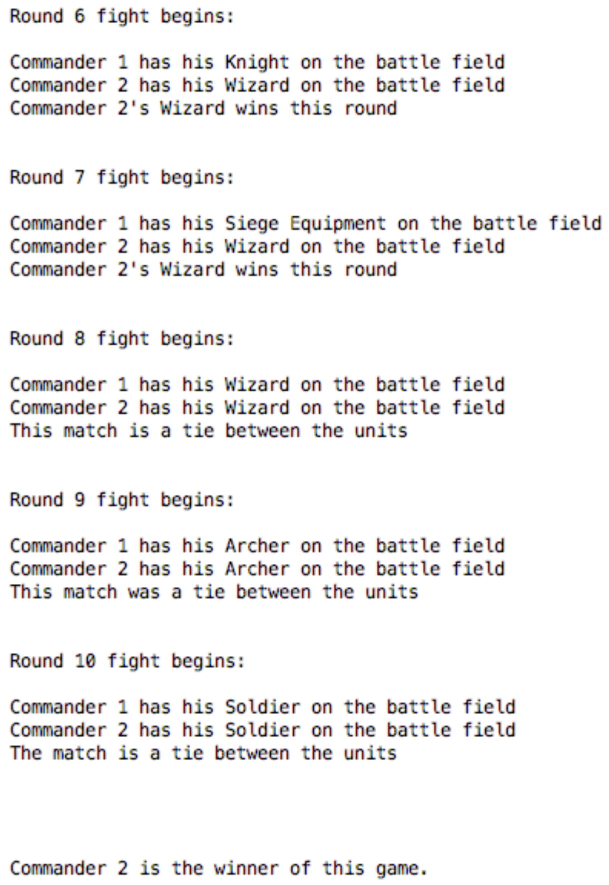
Commander 1: [Archer, Soldier, Knight, Siege Equipment, Wizard]
Commander 2: [Soldier, Knight, Siege Equipment, Wizard, Archer]

Screenshots of output for this set of input is as follows:



```
-------------------------------The fight begins now-------------------------------


Round 1 fight begins:

Commander 1 has his Archer on the battle field
Commander 2 has his Soldier on the battle field
Commander 1's unit Archer wins this round.


Round 2 fight begins:

Commander 1 has his Archer on the battle field
Commander 2 has his Knight on the battle field
Commander 2's Knight wins this round


Round 3 fight begins:

Commander 1 has his Soldier on the battle field
Commander 2 has his Knight on the battle field
Commander 1's Soldier wins this round


Round 4 fight begins:

Commander 1 has his Soldier on the battle field
Commander 2 has his Siege Equipment on the battle field
Commander 2's Siege Equipment wins this round


Round 5 fight begins:

Commander 1 has his Knight on the battle field
Commander 2 has his Siege Equipment on the battle field
Commander 1's Knight wins this round
```

OUTPUT FOR A SPECIFIC INPUT CASE (SCREENSHOT 1)



```
Round 6 fight begins:

Commander 1 has his Knight on the battle field
Commander 2 has his Wizard on the battle field
Commander 2's Wizard wins this round


Round 7 fight begins:

Commander 1 has his Siege Equipment on the battle field
Commander 2 has his Wizard on the battle field
Commander 2's Wizard wins this round


Round 8 fight begins:

Commander 1 has his Wizard on the battle field
Commander 2 has his Wizard on the battle field
This match is a tie between the units


Round 9 fight begins:

Commander 1 has his Archer on the battle field
Commander 2 has his Archer on the battle field
This match was a tie between the units


Round 10 fight begins:

Commander 1 has his Soldier on the battle field
Commander 2 has his Soldier on the battle field
The match is a tie between the units



Commander 2 is the winner of this game.
```

OUTPUT FOR A SPECIFIC INPUT CASE (SCREENSHOT 2)

As seen in the above screenshot for a specific input case the winning unit for each round is displayed on the output and at the final part of the output the winning commander/player is displayed.