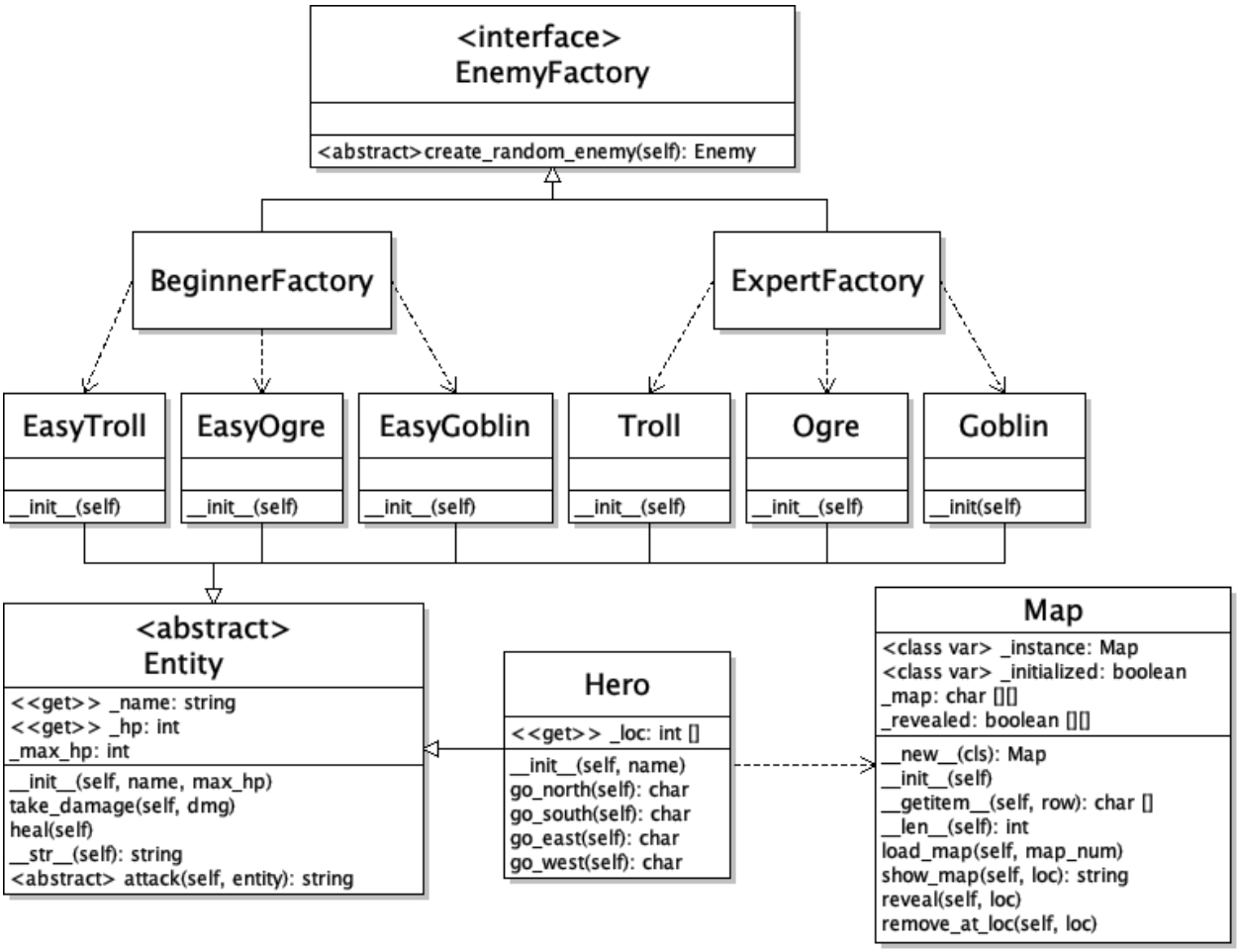
CECS 277 – Lab 12 – Factory Method

Mazes and Monsters

Use the program that you created for Lab 11 and add an Enemy Factory to it. Use the following UML diagram and the class descriptions below to create your program.



Classes:

1. Entity – no changes
2. Enemy – remove this class
3. Hero – no changes
4. Map – singleton – the map of the dungeon maze.
    a. __init__(self) – move the code for reading in the file to the method below (load_map) and call it to load the first map.
    b. load_map(self, map_num) – passes in an integer for map number (1, 2, or 3). Fill the 2D map list from the specified file contents and reset the 2D revealed list with all False values.
    c. all other methods are the same.
5. EnemyFactory – interface

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    a. create_random_enemy(self) – abstract method (no code) that each concrete factory overrides to create and return enemy objects.
6. BeginnerFactory – factory to create easy enemies.
    a. create_random_enemy(self) – randomizes and constructs one of the easy enemies (EasyTroll, EasyOgre, or EasyGoblin).
7. ExpertFacory – factory to create more difficult enemies.
    a. create_random_enemy(self) – randomizes and constructs one of the difficult enemies (Troll, Ogre, or Goblin).
8. Enemy Classes (EasyTroll, EasyOgre, EasyGoblin, Troll, Ogre, and Goblin) –
    a. __init__(self) – randomize max_hp according to the table below for each of the different enemies. Call super().__init__ to initialize the name and randomized max_hp (Note: give the difficult enemies a scarier name so that it is easy for me to tell that the correct factory was used (ex. "Angry Troll" or "Horrible Ogre").
    b. attack(self, entity) – enemy attacks hero – randomize damage according to the table below. The hero should take the damage and the method should return a string representing the event.

Enemy	**Troll**	**Ogre**	**Goblin**
Easy	HP: 4-5, Dmg: 1-5	HP: 3-5, Dmg: 1-4	HP: 3-4, Dmg: 1-3
Difficult	HP: 10-14, Dmg: 8-12	HP: 8-12, Dmg: 6-10	HP: 6-10, Dmg: 4-8

9. Main – prompt the user to enter their name, and a difficulty level. Then construct the hero, the map, and the appropriate factory (beginner or expert) that the user chose. Create a loop that repeats until the hero dies, or the user quits the game. Have the user to choose a direction to move in (north, south, east, west), move the hero in that direction, reveal that spot, and then present the encounter at that location as follows:
    a. 'm' – monster – construct an enemy using the factory and display its information. The rest of the attack should work the same as before.
    b. 'x' – no change
    c. 'n' – no change
    d. 's' – no change
    e. 'i' – no change
    f. 'f' – finish – display a congratulatory message stating that they found the entrance to the next level. Load the next map. The maps are loaded in the order 1,2,3,1,2,3,… (hint: you can keep a counter that increments and then resets back to 1 if it reaches 4).

Example Output:

```
What is your name, traveler? Link
Difficulty:
1.Beginner
2.Expert
2
Link
HP: 25/25
* x x x x
x x x x x
x x x x x
x x x x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 2
There is nothing here...
```

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```
Link
HP: 25/25
s x x x x
* x x x x
x x x x x
x x x x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 2
You encounter a Tremendous Troll
HP: 10/10
1. Attack Tremendous Troll
2. Run Away
Enter choice: 1
Link attacks a Tremendous Troll for
5 damage.
Tremendous Troll attacks Link for
10 damage.
1. Attack Tremendous Troll
2. Run Away
Enter choice: 1
Link attacks a Tremendous Troll for
5 damage.
You have slain a Tremendous Troll
Link
HP: 15/25
s x x x x
n x x x x
* x x x x
x x x x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 3
There is nothing here...
Link
HP: 15/25
s x x x x
n x x x x
n * x x x
x x x x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 2
You found a Health Potion!  You
drink it to restore your health.
Link
HP: 25/25
s x x x x
n x x x x
n n x x x
x * x x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 3
There is nothing here...
Link
HP: 25/25
s x x x x
n x x x x
n n x x x
x n * x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 2
There is nothing here...
Link
HP: 25/25
s x x x x
n x x x x
n n x x x
x n n x x
x x * x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 3
You encounter a Vicious Goblin
HP: 7/7
1. Attack Vicious Goblin
2. Run Away
Enter choice: 1
Link attacks a Vicious Goblin for 3
damage.
Vicious Goblin attacks Link for 4
damage.
1. Attack Vicious Goblin
```

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```
2. Run Away
Enter choice: 1
Link attacks a Vicious Goblin for 3
damage.
Vicious Goblin attacks Link for 4
damage.
1. Attack Vicious Goblin
2. Run Away
Enter choice: 1
Link attacks a Vicious Goblin for 2
damage.
You have slain a Vicious Goblin
Link
HP: 17/25
s x x x x
n x x x x
n n x x x
x n n x x
x x n * x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 3
Congratulations! You found the
stairs to the next floor of the
dungeon.
Link
HP: 17/25
x x x x x
x x x x x
x x x x x
x x x x x
x x x x *

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 1
There is nothing here...
Link
HP: 17/25
x x x x x
x x x x x
x x x x x
x x x x *
x x x x s

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
```

```
Enter choice: 1
You found a Health Potion!  You
drink it to restore your health.
Link
HP: 25/25
x x x x x
x x x x x
x x x x *
x x x x n
x x x x s

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 1
There is nothing here...
Link
HP: 25/25
x x x x x
x x x x *
x x x x n
x x x x n
x x x x s

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 1
You encounter a Lumbering Ogre
HP: 10/10
1. Attack Lumbering Ogre
2. Run Away
Enter choice: 2
You ran away!
Link
HP: 25/25
x x x x m
x x x x *
x x x x n
x x x x n
x x x x s

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 4
You encounter a Lumbering Ogre
HP: 9/9
1. Attack Lumbering Ogre
2. Run Away
Enter choice: 1
```

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```
Link attacks a Lumbering Ogre for 4
damage.
Lumbering Ogre attacks Link for 9
damage.
1. Attack Lumbering Ogre
2. Run Away
Enter choice: 1
Link attacks a Lumbering Ogre for 3
damage.
Lumbering Ogre attacks Link for 10
damage.
1. Attack Lumbering Ogre
2. Run Away
Enter choice: 1
Link attacks a Lumbering Ogre for 5
damage.
You have slain a Lumbering Ogre
Link
HP: 6/25
x x x x m
x x x * n
x x x x n
x x x x n
x x x x s
```

```
1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 1
Congratulations! You found the
stairs to the next floor of the
dungeon.
Link
HP: 6/25
x x x * x
x x x x x
x x x x x
x x x x x
x x x x x

1. Go North
2. Go South
3. Go East
4. Go West
5. Quit
Enter choice: 5
Game Over
```

Notes:

1. You should have 13 different files: main.py, entity.py, hero.py, map.py, enemy_factory.py, beg_factory.py, exp_factory.py, easy_troll.py, easy_ogre.py, easy_goblin.py, troll.py, ogre.py, goblin.py.
2. Check all user input using the get_int_range function in the check_input module.
3. Do not create any extra methods, attributes, functions, parameters, etc.
4. Please do not create any global variables (besides the singleton map), or use attributes globally (ie. do not access any of the attributes using the underscores).
5. Use docstrings to document each of the classes, their attributes, and their methods.
6. Place your names, date, and a brief description of the program in a comment block at the top of your main file. Place brief comments throughout your code.
7. When you run away from a monster the 'm' stays on the map. If you return to that same location, it will randomize a new monster (ie. it may not be the exact same monster).
8. Thoroughly test your program before submitting:
    a. Make sure that when the user reaches the finish, it does not end the game.
    b. Make sure that the maps repeat forever (1,2,3,1,2,3,…). You can't win this game.
    c. Make sure that a random enemy is constructed from the factory that the user chose (beginner or expert). Do not preconstruct the enemies and then randomly select them from a list, because if they are chosen again their hp will still be 0.

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