**You are charged of designing a GUI based game that works as follows:**

1. The main entity in the game is the Character objects where characters can be anything (batman, Spider man, Flash, Mikey mouse, etc.). the main character class need to support generalization and each character should add specialization attributes and methods (Spider man has web, etc)
2. Characters are driven by a power bar which is a reflection of power level that each character has.
3. When an object is first created it’s power level is set to a preconfigured value (10 for example)
4. A character is an aggregation of powers and power can be gained by playing the game. The powerup Panel could include power items like: weapons, special moves, vehicles, etc)
5. The games could be based on any algorithm and multiple algorithms shall be supported (fighting using random time and number generation). Algorithms shall be added and removed without impacting the system or having to recompile client’s code.
6. The winner of the game gets his power bar increased by a configurable amount.
7. Each character is also attached to an experience bar along with level controls. A Character can have a fight with only character at the same level. Points can be added to the power bar (levels)
8. Embellishment objects can be added to characters to support their fight.
9. There shall be one and only one character object for all characters (one spider man) and your classes design needs to enforce this.
10. You can add your own rules to the game as long as you document them.
11. Creation of objects shall be controlled by specialized methods and objects.
12. The main arena is called “Plate of Fire”

**What to submit:**

1. Detailed description of the rules and design of the game (text)
2. A prototype of the design (could be Photoshop picture showing the layout of the game main area outlining all objects)
3. Class diagram/s for your design showing all structures and an independent class diagram for each design pattern used in the game.
4. You shall use at least 2 design patterns from each design pattern category (creational, structural and behavioral)
5. Working code is NOT required but code snippets is expected for each design pattern used.
6. State Diagram for all objects in the game.
7. Be creative in the game algorithms and use known metaphors.
8. Classes and Interfaces in the class diagram needs to be complete and your diagram is fully UML compliant (show all attributes and methods with appropriate access modifiers)

**Final Exam - Due: Dec/4th 2015.**

Creational:

Singleton – Based on point number 9.

Factory Method Pattern – Based on point number 11.

Structural:

Decorator – Based on point number 8

Adding embellishments

Disguise using a cape

Disguise using invisible cloak

Composite –

Design of the arena

Hero, Mountains and canyons are glyphs and Arena is composite object.

Behavioral:

Strategy – Based on point number 5

How they fight

Kick boxing

Martial arts

Gun fighting

Command – Based on point number 4

Power ups

Weapons

Special moves