**Introduction to Computers II – Assignment #7**

Please implement the following classes:

1. GeneralPlayer
   * data members
     + string name
     + int level // >=0
     + int hp // >=0
     + int mp // >=0
     + int exp // >=0
     + int max\_hp // automatically calculated, >=0
     + int max\_mp // automatically calculated, >=0
     + int max\_exp // automatically calculated, >=0
     + int attack // automatically calculated, >=0
     + int defense // automatically calculated, >=0
   * public functions
     + GeneralPlayer () // default constructor, level = 1, hp = 100, mp = 50, exp = 0, name = “”
     + GeneralPlayer (int, int, int, int) // constructor without player name (level, hp, mp, exp)

// name = “”

* + - GeneralPlayer (int, int, int, int, string) //constructor with player name
    - GeneralPlayer (const GeneralPlayer &) //copy constructor
    - string getName()
    - void setName(string)
    - int getHP()
    - void setHP(int)
    - int getMP()
    - void setMP(int)
    - int getExp()
    - void setExp(int)
    - void setLevel(int);
    - void setAttr(int);
    - void levelUp(void);
    - void increaseHP(int);
    - void increaseMP(int);
    - void increaseExp(int);
    - void recoverHP(void); // hp = max\_hp;
    - void recoverMP(void); // mp = max\_mp;

2. OrcPlayer

* + - constructors
    - void setLevel(int);
    - void setAttr(int);
    - void levelUp(void);

3. KnightPlayer

* + - constructors
    - void setLevel(int);
    - void setAttr(int);
    - void levelUp(void);
    - void heal(void);
    - other functions

4. MagicianPlayer

* + - constructors
    - void setLevel(int);
    - void setAttr(int);
    - void levelUp(void);
    - void pray(void);
    - other functions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | max\_hp | max\_mp | attack | defense |
| GeneralPlayer | 100 + 10\*L | 40 + 5\*L | 20 + 5\*L | 20 + 5\*L |
| OrcPlayer | 200 + 20\*L | 50 + 5\*L | 50 + 12\*L | 30 + 10\*L |
| KnightPlayer | 150 + 25\*L | 70 + 10\*L | 40 + 10\*L | 20 + 12\*L |
| MagicianPlayer | 120 + 15\*L | 100 + 15\*L | 30 + 8\*L | 20 + 7\*L |

max\_exp = ceiling( (log2(level+1))^2 \* 100 )

e.g.

|  |  |
| --- | --- |
| Level | max\_exp |
| 1 | 100 |
| 2 | 252 |
| 3 | 400 |
| 4 | 540 |
| 5 | 669 |
| 6 | 789 |
| 7 | 900 |
| 8 | 1005 |
| 9 | 1104 |
| 10 | 1197 |