CSE 443 HW-2 Report

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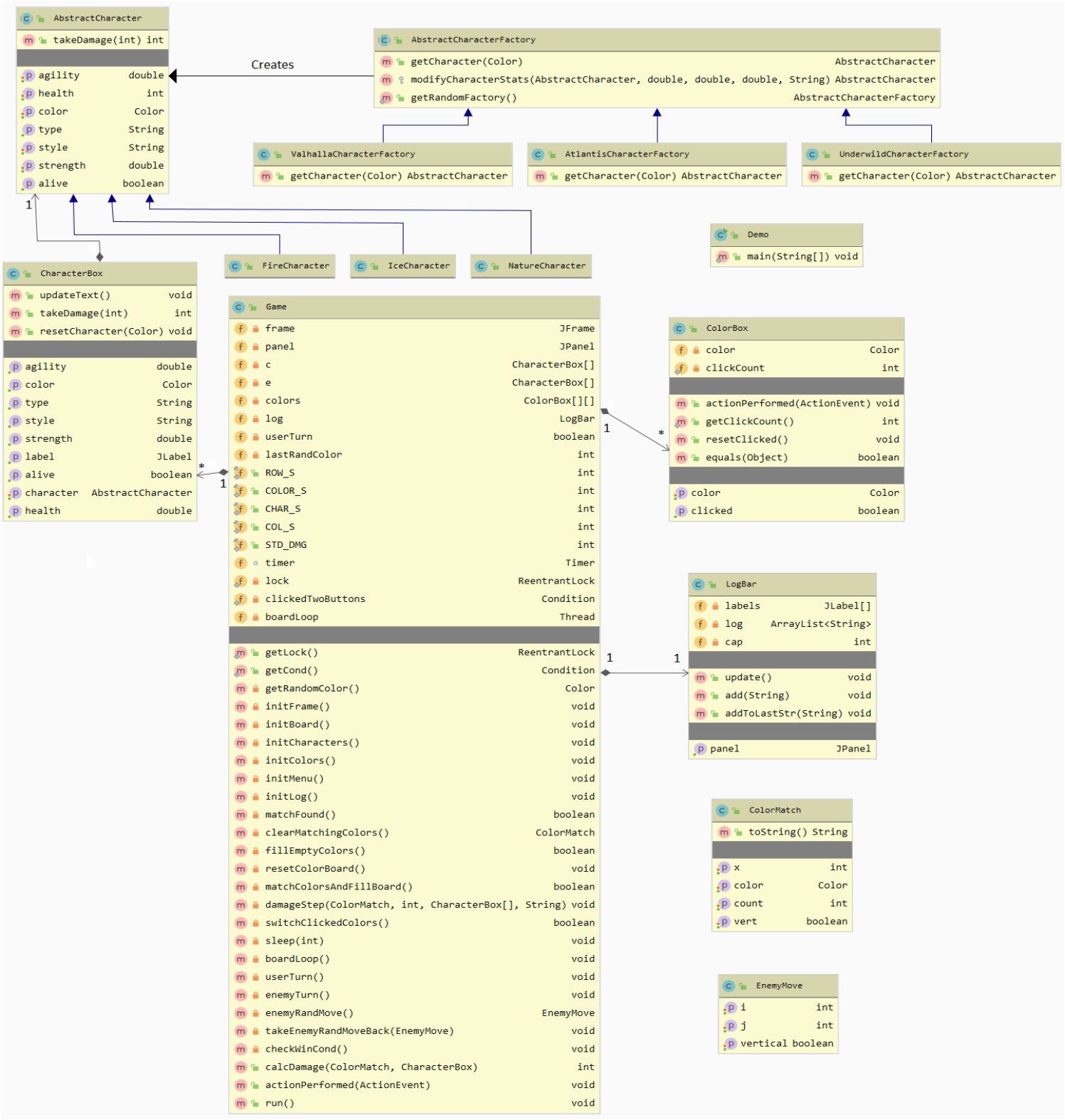

Characters:
Every character has the same properties. So I created an AbstractCharacter class that holds those properties. 3 character classes extend that class and initialize their stats to those abstract properties.

Factories:
We have 3 factory classes that extend the AbstractFactory class which provides possible requirements to create character classes with wanted style and type. Style factories only change the stats with their specific modifiers. To do that I created a method in the AbstractFactory class which modifies the stats according to given parameters. Concrete style factories use this method to change the character stats so I provided code reuse with this.

Game mechanics and UI:

Characters:
The Game class uses CharacterBox class to hold the user characters and enemy characters. CharacterBox class has an Abstract character field which has character stats and a JLabel class to print those character stats to the game panel.

Colors:
Game class also uses ColorBox class to hold the colors in the color table. ColorClass extends JButton to make this class a button itself. Switching color functionalities are done by button action listeners.

Game loop:
I provided synchronization with ReentrantLock and Condition objects. Game loop waits Condition object to be notified which is waiting with await method in order to check if clicked colors are valid to switch. With this, poor synchronization methods like busy waiting and sleeping etc. are prevented, saving valuable cpu cycles.
After game loop is woken up it checks if clicked color buttons are valid to switch, and if they are, clicked colors are switched. Then color matches are removed from the table damage given by them is calculated and reflected to the corresponding characters. Then empty color tiles are filled in a loop, allowing for cascaded matches.
And then it is time for the enemy to make a move.
I need to mention that I calculated the damage according to tile count. Because in some conditions one match is shared between multiple characters. So they take damage with the ratio of how many single tile they vertically intersect with. One single tile's standard damage is 5. Modifiers are aplied to this value.