For this midterm please construct the class **Trooper.java** and the derived class
RebelTrooper.java and **StormTrooper.java**

UML Diagram of the Assignment

Trooper

f	🔒 unit	String
f	🔒 number	int
f	○ trooperKind	String
f	○ marchSpeed	double
f	○ marchModifier	double
m	○ Trooper()	
m	🔒 Trooper(String, int)	
m	🔒 addToUnit(HashMap<String, List<Trooper>>, Trooper) void	
m	🔒 march(double)	double
m	🔒 attack(Trooper, int)	boolean
m	🔒 getUnit()	String
m	🔒 setUnit(String)	void
m	🔒 getNumber()	int
m	🔒 setNumber(int)	void
m	🔒 getTrooperKind()	String
m	🔒 setTrooperKind(String)	void
m	🔒 getMarchSpeed()	double
m	🔒 setMarchSpeed(double)	void
m	🔒 toString()	String
m	🔒 equals(Object)	boolean
m	🔒 hashCode()	int

StormTrooper

f	🔒 name	String
f	🔒 soldierCount	int
m	🔒 StormTrooper(String, int)	
m	🔒 march(double)	double
m	🔒 getName()	String
m	🔒 setName(String)	void
m	🔒 getSoldierCount()	int
m	🔒 toString()	String

RebelTrooper

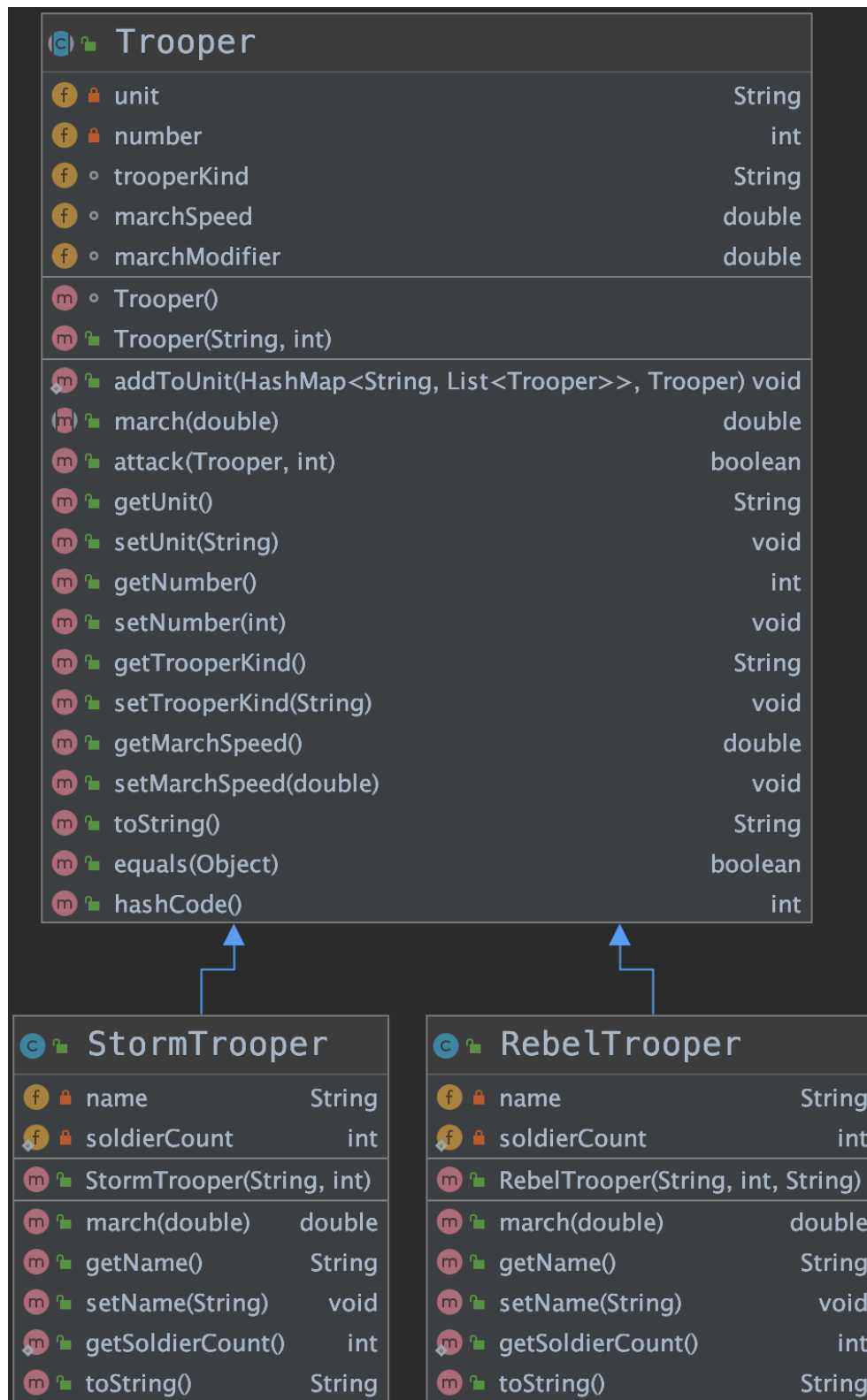|		
f	🔒 name	String
f	🔒 soldierCount	int
m	🔒 RebelTrooper(String, int, String)	
m	🔒 march(double)	double
m	🔒 getName()	String
m	🔒 setName(String)	void
m	🔒 getSoldierCount()	int
m	🔒 toString()	String

Figure 1: UML Diagram of Trooper,RebelTrooper, and StormTrooper

Trooper.java

Fields / Data Members / Variables

unit and **number** are *private*

Constructors

The no-parameter constructor uses **this** to call the parameterized constructor with default values of "AA" and 0

The parameterized constructor performs the following actions:
- uses the input parameters to set the fields **unit** and **number**.
- Sets marchSpeed to 5

Methods

all of the **getters** and **setters** are standard and may (should!) be auto generated. The **equals** and **hashCode** methods are also **auto generated** and use every field.

toString() returns the field **unit** concatenated with the field **number**, concatenated with a ": "

addToUnit(HashMap<String, List<Trooper>> units, Trooper t)
addToUnit takes two parameters:
1. **HashMap units** with a key of type String and a value of type List<Trooper>
   a. The key will be a string that matches the value held in unit of the t.
   b. The value will be a list of all the Trooper objects with the same value for unit
2. **Trooper T**
   a. This is the Trooper to add to the List

Logic

- check if Trooper is null, if so return
- check if the HashMap already has a key that matches the current Trooper unit
  o if not create a list with the current Trooper's **unit** as the key
- add the current trooper to the correct unit

march(double) is an abstract method (I want to see if you know what this means)

attack(Trooper target, int roll)

The following is a listing of the logic for the attack class. Check the demo output below for expected formatting.

Logic

This method will print out two lines:
{current object toString} is attacking {target}
{current object toString} rolled a {roll}

- if the current object and the target are the same OR if {roll} is 1
  - print out:
    {current object toString} is targeting itself.
    {current object toString} rolled a {roll} and hurt itself in the confusion
  - **return** TRUE
- if the current object is a **StormTrooper** and the target is a:
  - **RebelTrooper**
    - print out:
      rolled a {int} against the rebel scum.
    - **return** TRUE if {roll} is greater than 10 AND {roll} is even
  - **Stormtrooper**
    - print out:
      No treason in the ranks!
    - **return** FALSE
  - **anything else**
    - print out:
      Acceptable Collateral Damage!
    - **return** TRUE if {roll} > 10 OR {roll} is even
- if the current object is a **RebelTrooper** and the target is a:
  - **RebelTrooper**
    - print out:
      Imperial Spy!
    - **return** FALSE
  - **Stormtrooper**
    - print out:
      rolled a {int} against the imperial scum.
    - **return** TRUE if {roll} is greater than 5 or {roll} is odd
  - **anything else**
    - print out:
      Rebels target an innocent bystander
    - **return** TRUE if {roll} >= 18 AND {roll} is even

StormTrooper.Java

Fields / Data Members / Variables

name is *private* and set to ""
soldierCounter is *private* and *static* and set to 0

Constructors

The parameterized constructor takes a String and an int.

The parameterized constructor performs the following actions:
- uses the constructor from the parent class to set the fields **unit** and **number**
- increments soldierCounter
- sets trooperKind to "StormTrooper"
- sets marchModifier to 1.10

Methods

setters and getters are standard autogenerated methods.

march(double duration) returns marchSpeed multiplied by duration multiplied by the marchModifier

toString() returns the name of the current object concatenated with a "(" concatenated with the value returned from the toString in the parent class, concatenated with the value from trooperKind

Check the demo output below for formatting specifics.

RebelTrooper.Java

Fields / Data Members / Variables

name is *private* and set to "Rebel"
soldierCounter is *private* and *static* and set to 0

Constructors

The parameterized constructor takes a String and an int and a String.

The parameterized constructor performs the following actions:
- uses the constructor from the parent class to set the fields unit and number
- increments **soldierCounter**
- sets **trooperKind** to "pilot"
- sets **marchModifier** to 0.75
- sets **name** to the parameter value passed in.

Methods

setters and getters are standard autogenerated methods.

march(double duration) returns marchSpeed multiplied by duration multiplied by the marchModifier

toString() returns the name of the current object concatenated with a "(" concatenated with the value returned from the toString in the parent class, concatenated with the trooperKind

Check the demo output below for formatting specifics.

Output

NOTE: The driver uses RANDOM numbers, so these values will be different

Rebel troopers: 2

Stormtroopers: 2

{red=[Luke(red5:) a pilot], tk=[(tk421:) a StormTrooper], black=[Poe(black1:) a pilot],

jb=[(jb7:) a StormTrooper]}

Luke(red5:) a pilot

Luke(red5:) a pilot Marched 38.0 meters

Luke(red5:) a pilot is attacking Luke(red5:) a pilot

Luke(red5:) a pilot rolled a 2

Luke(red5:) a pilot is targeting itself...

Luke(red5:) a pilot rolled a 2 and hurt itself in the confusion.

Hit!

Luke(red5:) a pilot is attacking (tk421:) a StormTrooper

Luke(red5:) a pilot rolled a 11

Rolled a 11 against the imperial scum

Hit!

Luke(red5:) a pilot is attacking Poe(black1:) a pilot

Luke(red5:) a pilot rolled a 1

Luke(red5:) a pilot is targeting itself...

Luke(red5:) a pilot rolled a 1 and hurt itself in the confusion.

Hit!

Luke(red5:) a pilot is attacking (jb7:) a StormTrooper

Luke(red5:) a pilot rolled a 18

Rolled a 18 against the imperial scum

Hit!

(tk421:) a StormTrooper

(tk421:) a StormTrooper Marched 132.0 meters

(tk421:) a StormTrooper is attacking Luke(red5:) a pilot

(tk421:) a StormTrooper rolled a 13

Rolled a 13 against against the rebel scum

Miss!

(tk421:) a StormTrooper is attacking (tk421:) a StormTrooper

(tk421:) a StormTrooper rolled a 14

(tk421:) a StormTrooper is targeting itself...

(tk421:) a StormTrooper rolled a 14 and hurt itself in the confusion.

Hit!

(tk421:) a StormTrooper is attacking Poe(black1:) a pilot

(tk421:) a StormTrooper rolled a 14

Rolled a 14 against against the rebel scum

Hit!

(tk421:) a StormTrooper is attacking (jb7:) a StormTrooper

(tk421:) a StormTrooper rolled a 6

No treason in the ranks!

Miss!

Poe(black1:) a pilot

Poe(black1:) a pilot Marched 75.0 meters

Poe(black1:) a pilot is attacking Luke(red5:) a pilot

Poe(black1:) a pilot rolled a 9

Imperial Spy!

Miss!

Poe(black1:) a pilot is attacking (tk421:) a StormTrooper

Poe(black1:) a pilot rolled a 13

Rolled a 13 against the imperial scum

Hit!

Poe(black1:) a pilot is attacking Poe(black1:) a pilot

Poe(black1:) a pilot rolled a 19

Poe(black1:) a pilot is targeting itself...

Poe(black1:) a pilot rolled a 19 and hurt itself in the confusion.

Hit!

Poe(black1:) a pilot is attacking (jb7:) a StormTrooper

Poe(black1:) a pilot rolled a 7

Rolled a 7 against the imperial scum

Hit!

(jb7:) a StormTrooper

(jb7:) a StormTrooper Marched 55.0 meters

(jb7:) a StormTrooper is attacking Luke(red5:) a pilot

(jb7:) a StormTrooper rolled a 4

Rolled a 4 against against the rebel scum

Miss!

(jb7:) a StormTrooper is attacking (tk421:) a StormTrooper

(jb7:) a StormTrooper rolled a 18

No treason in the ranks!

Miss!

(jb7:) a StormTrooper is attacking Poe(black1:) a pilot

(jb7:) a StormTrooper rolled a 2

Rolled a 2 against against the rebel scum

Miss!

(jb7:) a StormTrooper is attacking (jb7:) a StormTrooper

(jb7:) a StormTrooper rolled a 14

(jb7:) a StormTrooper is targeting itself...

(jb7:) a StormTrooper rolled a 14 and hurt itself in the confusion.

Hit!

Process finished with exit code 0