Assignment 1 – Simple Superhero Showdown

Goals

- Review Java syntax, methods, and classes
- Navigate Android Studio
- Work with emulators

Required naming convention

- Typical assignments will have a required naming convention
- However since we are providing you starting code, there is no required name convention
- However, be sure to include your name and info in the comments of each file

Overview / Goal

- The purpose of this assignment is to familiarize yourself with Android Studio and to review Java syntax.
- All the "Android code" and UI elements have been provided for you. You will strictly be writing "plain" Java code
- You are building a very simple superhero battle simulator. Each superhero has a health value and an attack value.
- Each superhero begins an initial health value (defined by a constant) and an attack value (randomly chosen).
- The heroes begin to fight (more described later), each one attacking the other in rounds of battle.
- The game ends when one (or both) of the heroes loses all their health.
- This assignment is designed to have **no user input** (which makes for a boring game, but this point is review Java).
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Requirements

- Download and open the starting project
- What is already created for you
    - MainActivity.java (the Android activity code)
    - res/activity_main.xml (the UI code)
- What you need to edit
    - Superhero.java (the Superhero object)
    - HeroBattle.java (the battle simulator)

Superhero Class

- The empty **Superhero.java** file is provided for you.
- The Superhero class has the following *private* instance variables
  - *name* is a **String** (which represents the name of the hero)
  - *healthPoints* is an **int** (which represents the hero's health points)
  - *attackValue* is an **int** (which represents the strength of the hero's attack)
- The Superhero class has four *public static final* constants
  - **MAX_HEALTHPOINTS** (which is an **int** and should be a constant with the value 100)
  - **MAX_ATTACKVALUE** (which is an **int** and should be a constant with the value 20)
  - **MIN_HEALTHPOINTS** (which is an **int** and should be a constant with the value 0)
  - **MIN_ATTACKVALUE** (which is an **int** and should be a constant with the value 5)
- The Superhero class has a constructor that takes only one input parameter (which is a String). This constructor will initialize all the instance variables as follows
  - *name* is assigned the value of the String input parameter
  - *healthPoints* is assigned the constant value of **MAX_HEALTHPOINTS**
  - *attackValue* is assigned a random value from **MIN_ATTACKVALUE** up to **MAX_ATTACKVALUE**
    - You will have to look up how to generate a random number in Java.
- The Superhero class has the following methods (some of these might not be used in this version of the program)
  - Mutators (takes one input parameter, and returns nothing)
    - *setName*
    - *setHealthPoints*
    - *setAttackValue*
  - Accessors (takes no input, and returns the current value of a private variable)
    - *getName*
    - *getHealthPoints*
    - *getAttackValue*
  - *getHeroStats* (takes no input, returns a String)
    - The returned String represents the current status of a hero. A sample output is provided below.
      Name: Wolverine
      Health Points: 100
      Attack Value: 50
  - *isInjured* (takes no input, returns a **boolean**)

- Description: A Superhero is considered *injured* if his/her health points are less than or equal to **MIN_HEALTHPOINTS**
- returns **true** if hero's health points is less than or equal to **MIN_HEALTHPOINTS**
- otherwise returns **false**
  - *loseHealthPoints* (takes an **int** input, and returns nothing)
    - subtracts the **int** input from the hero's *healthPoints* and updates the instance variable (negative health points is OK)

HeroBattle Class
- The empty **HeroBattle.java** file is provided for you.
- The HeroBattle class has single method *play* (takes no input, returns a **String**)
  - The String that is return represents all the text generated in a battle and will be used by the activity to display the entire results of the game
  - Create two Superhero objects
  - Generate initial stats
  - Have the players "fight" **as long as neither player is injured**
    - Hint: For the condition for this while, remember the **Superhero** class has a method called *isInjured()*
    - Every time the players fight, they should each have their health decrease by the amount of the other players attack value, and also generate out the fight round number and each hero's information (use *displayHero()*)
      - For example, if
        player1 has **healthPoints** = 10 and **attackValue** = 1, and
        player2 has **healthPoints** = 20 and **attackValue** = 2
      - Then after one round,
        player1 has **healthPoints** = 8 (which is 10-2), and
        player2 has **healthPoints** = 19 (which is 20-1)
  - After the fight is finished and one player is injured, determine who the winner is and print out the result
    - The loser is the player who is injured, and the winner is the other player.
    - It is possible that both players are injured. In this case, you must say there was a tie

- **IMPORTANT:** When you have completed the HeroBattle class, open MainActivity.java in the itp341.javareview/activities package and uncomment line #40

Deliverables

1. A compressed file containing your app. Follow the guidelines for full credit.
   <u>Here are the instructions for submission</u>
   a) Navigate to your project folder.
   b) Include the *entire* folder in a zip file
   c) Rename the zip file so it follows this convention: *A#.lastname.firstname*
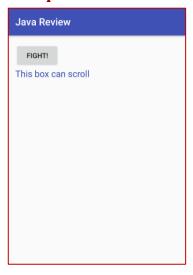   d) Upload zip file to Blackboard site for our course

Note: Test app on AVD

Grading

Item	Points
Superhero class variables and constants	3
Superhero class methods	7
HeroBattle class play method	10
Total	20

Sample Output

Java Review	Java Review	Java Review
FIGHT!	FIGHT!	FIGHT!
This box can scroll	HEROES Name: Wolverine Health Points: 100 Attack Value: 20 Name: Magneto Health Points: 100 Attack Value: 17 FIGHT! ====== Round 1 ====== Name: Wolverine Health Points: 83 Attack Value: 20 Name: Magneto Health Points: 80 Attack Value: 17 ====== Round 2 ======	Name: Magneto Health Points: 40 Attack Value: 17 ====== Round 4 ====== Name: Wolverine Health Points: 32 Attack Value: 20 Name: Magneto Health Points: 20 Attack Value: 17 ====== Round 5 ====== Name: Wolverine Health Points: 15 Attack Value: 20 Name: Magneto Health Points: 0 Attack Value: 17 Wolverine won!
Initial Screen	Results after pressing **Fight**	Results after pressing **Fight** (scrolled to the bottom

Sample Text Output

```
HEROES
Name: Wolverine
Health Points: 100
Attack Value: 15
Name: Magneto
Health Points: 100
Attack Value: 19

FIGHT!
====== Round 1 ======
Name: Wolverine
Health Points: 81
Attack Value: 15
Name: Magneto
Health Points: 85
Attack Value: 19

====== Round 2 ======
Name: Wolverine
Health Points: 62
Attack Value: 15
Name: Magneto
Health Points: 70
Attack Value: 19

====== Round 3 ======
Name: Wolverine
Health Points: 43
Attack Value: 15
Name: Magneto
Health Points: 55
Attack Value: 19

====== Round 4 ======
Name: Wolverine
Health Points: 24
Attack Value: 15
Name: Magneto
Health Points: 40
Attack Value: 19
```

```
====== Round 5 ======
Name: Wolverine
Health Points: 5
Attack Value: 15
Name: Magneto
Health Points: 25
Attack Value: 19

====== Round 6 ======
Name: Wolverine
Health Points: -14
Attack Value: 15
Name: Magneto
Health Points: 10
Attack Value: 19

Magneto won!
```