**CS Classes and Objects Unit: Phone Lab**

Learning Target: I can write a class that doesn’t conform to the normal structure (set/get).

Write a class for a **Phone**. Include…

* one instance variable, its **integer** battery charge percentage (0 to 100). **Include a getter but not a setter.**
* a regular constructor. Note that the user should not be able to specify a charge outside of 0 to 100.
* a default constructor that sets the charge to 0
* **toString ()** in the format : **A phone charged at \_\_\_%**
* Make a main() method to test what you have done so far. Use it to test the methods below as well. Test them one at a time!

Include…

* **a void** method called **die()** – it sets the battery to 0 and prints out: **The phone needs to be charged**
* a **void** method called **checkEmail():**
  + If the battery has at least 1 percent, the phone checks for email. Print out **“No new messages”** and decrease the battery by 1%
  + If the phone has 0 battery left, the phone dies
* a **void** method **charge()** that takes 1 integer parameter, the number of minutes to charge
  + print out **“Charging…”**
  + charge the phone 1 percent per minute
  + Keep in mind the most a phone can be charged is 100%
  + If the user types in negative minutes, the phone charge does not change

**BONUS:**

* a **void** method called **playGame():**
  + If the battery is between 1 and 9, print out: **Not enough battery to play game**
  + If the battery percentage is 10 or more..
    - Print out: **Playing a game**
    - One round of a game: 50% of the time, you win. 50% of the time, you lose. Print out whether you won or lost.
    - Decrease the battery by 10%
  + If the phone has 0 battery left, the phone dies

See the next page for sample output and rubric. **The testing program is posted to Blackboard. Copy and paste it to your Unit 8 folder.**

|  |  |  |
| --- | --- | --- |
| Test | Expected Result | Worked? |
| Make a new phone with the default constructor and print it out | A phone charged at 0% |  |
| Make a new phone with 37% charge | A phone charged at 37% |  |
| Make a new phone with 150% charge | A phone charged at 100% |  |
| Make a new phone with -23% charge | A phone charged at 0% |  |
| Make the phone die and print it out | The phone needs to be charged  A phone charged at 0% |  |
| Check email on a phone charged at 37% and then print it out | No new messages  A phone charged at 36% |  |
| Check email on a phone with 0% charge and then print it out | The phone needs to be charged  A phone charged at 0% |  |
| Check email on a phone with 1% charge and then print it out | No new messages  The phone needs to be charged  A phone charged at 0% |  |
| Charge a phone currently at 37% for 10 minutes and print it out | Charging…  A phone charged at 47% |  |
| Charge a phone currently at 37% for 100 minutes and print it out | Charging…  A phone charged at 100% |  |
| Charge a phone currently at 37% for -20 minutes and print it out | Charging…  A phone charged at 37% |  |

Rubric

* Program is named Phone.java
* Indenting
* Comment header
* Constructors (2 pts)
* Each method (4 pts): die, checkEmail, charge, toString
* Main method