

## ITEC 120 Lab 12

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You will need to turn in a lab report for this lab.

*Read the entire lab before starting. The final part of the lab is easy if you design the first part correctly.*

### **Problem 1: Zombie invasion**

The year is 2200 and the world is in chaos. After hundreds of years of experimenting, evil scientists have finally perfected the process of creating zombies. They have unleashed their creations on the world and you and your friend are the only people left alive in the city of Fiddler's Green. You have two pistols with fifteen shells in each and a shotgun with six shots. There are fifteen zombies staring at you in a manner not unlike a hungry man looking at a steak. Write a program that will determine whether or not you and your friend will be able to defeat the zombies, otherwise you will end up joining the horde of undead.

### **Part 1: The gun class**

A gun deals a certain amount of damage to a zombie, has a certain number of shells (ammunition), and has a chance of missing the zombie (accuracy). Create three different types of guns (1 class and 3 variations) for use in your simulation. The pistol has 15 shells, a 15% chance of missing a zombie, and deals 5 damage to a zombie. The rifle has 15 shells, a 10% chance of missing a zombie and deals 20 damage. The shotgun has 6 shells, a 5% chance of missing a zombie and deals 20 damage to a zombie.

The gun class should have a method that returns the amount of damage a shot does. This will take into account the percentage of missing the zombie. A recommended addition to the gun class are three methods that configure the gun to be either a pistol, rifle, or shotgun.

### **Part 2: The person class**

A person has the ability to carry one gun at a time and can shoot zombies with the gun. They also have 20 hit points (HP). If the player runs out of ammunition, they lose 10 HP while they are clubbing the zombie to death with their gun.

A recommended design is a class that has a Gun object and an integer representing the HP of the player. The methods for the class would be a constructor that creates a person with a pistol and 20 HP; a set gun method which changes which gun the person is shooting; a get gun method which returns the gun the person is using; a gunEmpty method that tells the simulator whether or not the player is out of ammunition; a shoot method that will receive information about a zombie (their hp) and will shoot a zombie or club them to death.

### **Part 3: The initial simulation**

You and your friend are in a situation where you cannot run away and the zombies can only attack you one at a time. A zombie has 20 HP, just like you do. You have two pistols and a shotgun, and your ammunition is special and pushes a zombie backwards so it can never reach you until you run out of ammunition. You and your friend have worked out a system where you will take a shot, then your partner will take a shot. The damage done by a shot is subtracted from a zombie's HP. When the zombie's HP becomes 0 or less, they die. When a zombie dies you revert back to your normal pattern of you shooting a zombie, then your friend shooting a zombie (note this may mean that you may run out of ammunition faster than your friend).

The shooting process is repeated until there are no more zombies left or you die. When one of you runs out of ammunition, you will switch to using the shotgun. You have enough time between shots to switch off using the shotgun so if both of you end up running out of ammunition, you can share the shotgun. When you (and/or your friend) run out of ammunition, you start clubbing zombies to death (remember, this costs 10 HP per zombie and can be done taking turns).

Write a simulation that covers you and your friend's battle with 15 zombies. Print out who survived the battle, or if the zombies won. If the zombies won, print out how many of them are left alive.

#### **Potentially helpful hints:**

Make sure a player is alive before telling them to shoot a zombie.

Only shoot a zombie who is alive (relatively speaking).

Print out when either you or your friend dies.

Print out when one of you is switching to use the shotgun.

Print out when someone is clubbing a zombie to death.

Print out who survived the battle or whether the zombies won and how many are left.

### **Part 4: A new hope**

Stories usually sell better if they have a happy ending. Before encountering the fifteen zombies, you and your friend find two rifles and decide to carry them instead of pistols. Re-run the simulation in Part 3 using rifles instead of pistols. Note: if you designed your classes correctly, you will be able to simply change what guns the two people are holding and re-run the simulation.