Proejct 2: The Enhanced "Target Game"

a Text-based Application Supporting Command Line Arguments

CISC 3120 Section TR2
Design and Implementation of Software Applications I

The project is to help students who have already had experience in programming in `C++` to achieve the following learning objectives in addition to the learning objectives defined in Project 1,

- to be able to use inheritance and polymorphism in an application consisting of multiple classes.

Project Description

You are to enhance a text-based game applications, called the "Target Game". The game is a single player game. First, the game sets a target on a two-dimensional space *randomly*, and asks the player to guess where the target is. The player wins the game when the player's guess is correct.

Compared with the "Target Game" developed in Project 1, this version of the game allows different types of targets and "shooting" weapons. A target can be a "Point" target (a target that occupies a single cell on the game board), a "Rectangle" target (a rectangular shape that occupies multiple cells), and a "Triangle" target (a triangular shape that occupies multiple cells), and these targets have different sizes in addition to different shapes as their names suggest. To simulate different types of shooting weapons, the game has the concept of "targeting area", that is, when a player enters a guess, that is, the coordinate of the target that she or he enters, the guess represents an area centered at the guessed position. For convenience, we call this the shooting area. For instance, if we consider the player is shooting a rifle, we consider the shooting area is a single cell; and the player a shotgun, multiple adjacent cells forming a circular area centered at the guessed coordinate.

To make this project feasible, the instructor divides the project into three phases. To complete the project, you only need to complete the first two phases. The third phrse is the *bonus* requirement where you integrate the previous two phases into one application and adds the functionality to allow multiple moving targets and to consider more realistic constriants of shooting weapons.

Project Requirement

As described in the above, you will complete the following two requirements in two separated Maven projects, phase 1 and phase 2. Since these two phases do not depend on each other, you can work on them in parallel.

Shaped Target of Different Shape and Size

This is phase 1 of the project. You make a *target* a hierarchy of different shapes. The start-up code is at the `ShapedTargetGame` folder in the `sampleprograms` repository on `Github`. For your convenience, the URL to the project on `Github` is as follows,

```
https://github.com/CISC3120/sampleprograms/tree/master/ShapedTargetGame
```

The target shapes must satisfy the following requirements.

- You will implement at least three shapes of targets, the Point shape, the Rectangle shape, and the Triangle shape.
- When the game runs, the type of shape, the size of the shape, and the position of the shape is randomly generated.

Multiple Weapons

For phase 2 where you make the *shoooting area* a hierarchy of different shapes. The start-up code is at the `TargetShootingGame` folder in the `sampleprograms` repository on `Github`. For your convenience, the URL to the project on `Github` is as follows,

`https://github.com/CISC3120/sampleprograms/tree/master/TargetShootingGame`

The shooting area must satisfy the following requirements.

- You will implement at least two shooting areas, representing two different types of weapons, a rifle whose shooting area is a point, and a shotgun whose shooting area is a circle.

Bonus Project Requirement

In phase 3, you integrate the results from both phase 1 and phase 2, and add additional functionality. Thus, the bonus requirements are as follows.

- In your game, you should permit different types of weapons and different types of targets. This is to integrate phase 1 and phase 2.
- The game allows multiple targets to be generated and displayed simultaneously, for which, you game application needs to maintain a list of targets. The hint of the design of this part is given in the start-up code at,

`https://github.com/CISC3120/sampleprograms/tree/master/ShapedTargetShootingGame`

If you and your team complete any one of the following two *bonus* requirements *in addition to* the requirements above, the instructor considers the quality of the project as "A+".

Project Invitation

Each team shall elects project coordinator for this project. The coordinator has the following responsibility,

- to accept the assignment invitation via the github classroom;
- to clone the team project repository;
- to copy and add the start-up project to your own project repository
- to commit and push the project, and to inform team members that the project set-up is ready

The team members shall accept the invitation and clone the project repository. The collaboration and project development continues.

The project assignment invitation is at

`https://classroom.github.com/g/Dvjo7_2n`

Submission

Submit your project by pushing your project to Github by 11:59PM, Wednesday, October 11.