

Information Expert: An example of the GRASP principle Information Expert can be seen in the `upgrade()` methods in `RedTower.java`, `BlueTower.java`, and `GreenTower.java`. This code follows this principle because instead of trying to manually upgrade towers when handling the upgrade button getting pressed in the `MainGame` class, we are assigning the upgrade responsibility for each type of tower to their respective tower classes. We are doing this because these classes have the relevant information, such as `damage`, `slowMultiplier`, and `healthIncrement`, that is necessary to fulfill our upgrade responsibility.

Single Responsibility Principle: The `VictoryScreen` class has the single responsibility of managing the UI for the victory screen. For example, the class must display the stats tracked over the game, but it does not ever modify these stats or even store them itself. It instead just gets the numbers from the `PlayerInfo` class and updates the display text accordingly. It must also restart the game once the button is clicked. In this case, the `VictoryScreen` class does not handle any of the logical parts of resetting the game, and all it does is switch the UI screen to the welcome screen. The only reason for the `VictoryScreen` class to change would be to make a change to the UI on the victory screen.

```
public VictoryScreen() {
    retryButton.setOnAction(new EventHandler<ActionEvent>() {
        @Override
        public void handle(ActionEvent actionEvent) {
            Controller.switchToWelcome();
        }
    });
    top.setAlignment(Pos.CENTER);
    top.getChildren().addAll(victoryText, stat1, stat2, stat3);
    mainPane.setTop(top);
    mainPane.setCenter(retryButton);
}

public static void updateStats() {
    if (!PlayerInfo.getIsAlive()) {
        return;
    }
    stat1.setText("Damage Taken: " + PlayerInfo.getDamageTaken());
    stat2.setText("Upgrades Purchased: " + PlayerInfo.getUpgradesPurchased());
    stat3.setText("Towers Placed: " + PlayerInfo.getTowersPlaced());
}
```

Polymorphism: An example of the GRASP principle, polymorphism, being followed can be seen with the enemies. We have an enemy abstract class that `OrangeEnemy.java`, `PurpleEnemy.java`, `YellowEnemy.java`, and `FinalBoss.java` extend from. These different enemies have different stats and functionalities. For instance, only the final boss is larger than a normal enemy, so it is the only

class that has a `setSize()` method. This effectively reduced coupling between the different enemies since the other enemies would have no use for the `setSize()` method. If we wanted to add other special behaviors later on, we could easily do so by making new enemies with those behaviors or just adding them to the existing types of enemies.

Open/Closed Principle: An example of the SOLID principle, Open/Closed principle can be seen in the implementation of Tower and its various child classes. This shows this principle because instead of adding to the existing code we created new classes and connected them through inheritance. This allows for the core of the Tower class to not be able to be broken because new functionalities and implementations will be in an extension of that class. We have set up RedTower, YellowTower, and BlueTower which allow for the extension of Tower without directly modifying it, thus allow us to make changes, but avoid unforeseen errors in the Tower class itself.