MINOR ASSIGNMENT-07

Game Programming with C++ (CSE 3545)

Publish on: 16-05-2025 **Submission on:** 20-05-2025
Course Outcome: CO_6 **Program Outcome:** PO_4 **Learning Level:** L_5

Problem Statement:

Experiment with bullet class design, collision detection (i.e. for bullets, zombies & the player) and updating the HUD.

Learning Objectives:

Students will be able to learn inheritance and polymorphism, shooting bullets and detect collision.

Answer the followings:

1. Name the SFML class to visually represent a bullet and declare a private member in Bullet class to represent the bullet.

SFML class & declare what each bullet looks like

2. Write the public member function prototypes of the **Bullet** class.

Sound files & purpose

```
class Bullet{
  public:
```

```
};
```

3. Write SFML-C++ statement(s) to define the constructor function for a bullet of size 20 × 20 and color red.

`Bullet` class constructor

4. Write the SFML-C++ statement(s) to set the position (i.e. `m_Position`) of a bullet with the parameters `startX` and `startY`. Also calculate the gradient of travel for a bullet to the target `targetX` and `targetY`.

Position & gradient

5. Assume that gradient of the flight path is `float gradient;` as calculated in the previous question. Now compute the speed horizontally and vertically for the bullet in terms of gradient given the bullet speed as `m_BulletSpeed`.

Speed horizontally & vertically

```
m_BulletSpeedY =

m_BulletSpeedX =
```

The private member variables `m_BulletSpeedY` & `m_BulletSpeedX` can also be states as `m_BulletDistanceY` & `m_BulletDistanceX` respectively.

6. Write the code snippet to set a maximum horizontal and vertical location that the bullet can reach from the position `startX` and `startY`, assuming a maximum range of 1200 pixels in any direction a bullet can be fired.

Set a maximum range of 1200 pixels for a bullet

7. Write the code snippet to test whether the bullet has moved beyond its maximum range. If so, set `m_InFlight=false`.

Code Snippet

8. Design the code snippet to handle the left mouse button being clicked to fire a bullet. Also identify the area in our main program to place this mouse handle part.

Code Snippet

9. State the code segment to loop through the **bullets** array to check whether the bullet is in flight and if it is, draw the bullet.

Code Snippet

10. Write the code snippet to test whether the player has been touched by a zombie and change the game state, if health of the player is ≤ 0.

Code Snippet

11. Write the code snippet to test whether a zombie has been shoot and change the game state, if all the zombies are dead.

Code Snippet

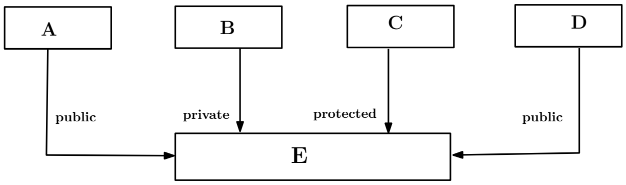
12. Let say a class **B** is publicly derived from class **A** with Class A has 4 public members and class B has 1 public member. Write the C++ syntax for such derivation along with number of public functions for class B to use.

Code Snippet

13. Let say a class **B** is privately derived from class **A** with Class A has 4 public members and class B has 1 private member. Write the C++ syntax for such derivation along with number of private members for class B to use.

Code Snippet

14. Write the C++ syntax for class **E** inherited from classes A, B, C and D. The figure shows the type of derivation.



Code Snippet

15. Find the output of the following code snippet;

```
class B1 {
 public:B1(){cout <<"B1"<<endl;}
};
class B2 {
 public:B2(){cout<<"B 2"<<endl;}
};
class : public B1, public B2 {
   public:D(){cout << "D" <<endl;  }
};
int main(){
   Derived d;return 0;}
```

Output