Department of Computer Science and Engineering
Institute of Technical Education & Research, SOA, Deemed to be University

MINOR ASSIGNMENT-05

Game Programming with C++ (CSE 3545)

Publish on: 01-05-2025 **Submission on:** 08-05-2025
Course Outcome: CO_4 **Program Outcome:** PO_4 **Learning Level:** L_6

Problem Statement:

Experiment with SFML `VertexArray` class to build up a large image efficiently and quickly onto the screen using multiple parts in a single image file (i.e. sprite sheet).

Learning Objectives:

Students will be able to learn `VertexArray` and C++ references to to create a scalable, random and scrolling background for Zombie Arena game.

Answer the followings:

1. Write C++ statements to create 3 references that would refer to **`int`** type **mark** variable.

Code Snippet

2. Find the output of the following code snippet;

```
int main(){
  int num=10;
  int& rnum=num;
  int &r1num=rnum;
  rnum=100;
  cout<<rnum<<" "<<num<<" "<<r1num<<endl;
  return 0;}
```

Output

3. Find the output of the following code snippet;

```
void update(int& rnum, int vnum, int *pnum){
   rnum=rnum+500;
   vnum=vnum+500;
   *pnum=*pnum+500;
}
int main(){
  int num1=11, num2=22,num3=33;
  update(num1,num2,&num3);
  cout<<num1<<" "<<num2<<" "<<num3<<endl;
  return 0;
}
```

Output

4. Consider the following C++ code snippet;

```
int& getMax(int &a, int &b) {
    return (a > b) ? a : b;
}
int main() {
    int x=?, y =?;
    int& maxVal = getMax(x, y);
    cout<<maxVal<<endl;
    maxVal = 30;
    cout <<"x = "<< x<< ", y= " <<y;
    return 0;
}
```

Find the output for given x & y

- ❑ 10 10
- ❑ 20 20
- ❑ 10 20
- ❑ 20 10
- ❑ 60 40
- ❑ 40 60

5. Write SFML-C++ code snippet to declare a vertex array with **Quads** type primitive and size of the vertex array $10 \times 10 \times 4$.

Code Snippet

6. Assume that **background_sheet.png** sprite sheet is given to you. Write SFML-C++ code snippet to draw 3 tiles (mud-1, grass, mud-2) onto the screen. you are free to decide the position of each vertex in the current quad and texture co-ordinates will be selected as per the given sprite sheet.

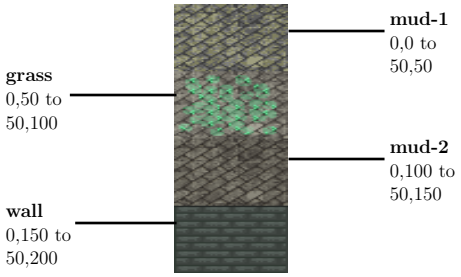

Figure 1: Background sprite sheet with texture coordinates for mud-1, grass, mud-2 and wall

Code Snippet

Code Snippet

Code Snippet

7. Design a function with the given prototype **`displayBackground(VertexArray& rVA, IntRect arena);`** to draw the background over the window as per the following structure using the above sprite sheet in question 6.

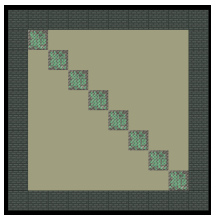

Figure 2: Arena Background

Code Snippet

Code Snippet

8. Design a function with the given prototype **`displayBackground(VertexArray& rVA, IntRect arena);`** to draw the background over the window as per the following structure using the above sprite sheet in question 6.

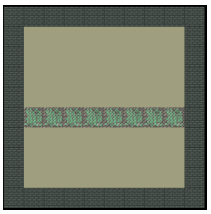

Figure 3: Arena Background

Code Snippet

Code Snippet

9. Design a function with the given prototype **`displayBackground(VertexArray& rVA, IntRect arena);`** to draw the background over the window as per the following structure using the above sprite sheet in question 6.

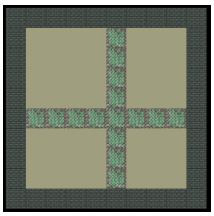

Figure 4: Arena Background

Code Snippet

Code Snippet

5. Let you have pressed the keys: **W**, **Return**, **Num0** and **Num1** respectively. Write a code snippet to handle the events by polling and show the type of key has been pressed.

Code Snippet

6. Assume **ON** and **OFF** are two states in a game with sprites **player.png** and **bloater.png**. Initially game is in **ON** state and the sprite, **player**, is drawn onto the game window. Game state can be changed with the key pressed **Return**. Construct a program to draw player sprite in ON state and bloater sprite in OFF state. `window.clear(Color::Red);` may be used to change in default background color.

Code Snippet

Code Snippet