Communications and Electronics Department-2nd Year

Embedded Systems – ELC2080

Data Structure Project

Snake Game using Queue

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Calculating Execution Time of The Game

To calculate the execution time of the game we remove the do while loop and calculate the time of one loop to build the game.

```
// Game loop
do {
    update();
    if (_kbhit()) {
        change_direction(_getch());
    }

} while    (game_over == false);
```

Then we add this line in the beginning of the main to get the time at this moment.

```
auto start = chrono::steady_clock::now();
```

then we add this line at the end of the main function to get the time at this moment.

```
auto end = chrono::steady_clock::now();
```

then we get the difference between the two times, and this is the execution time

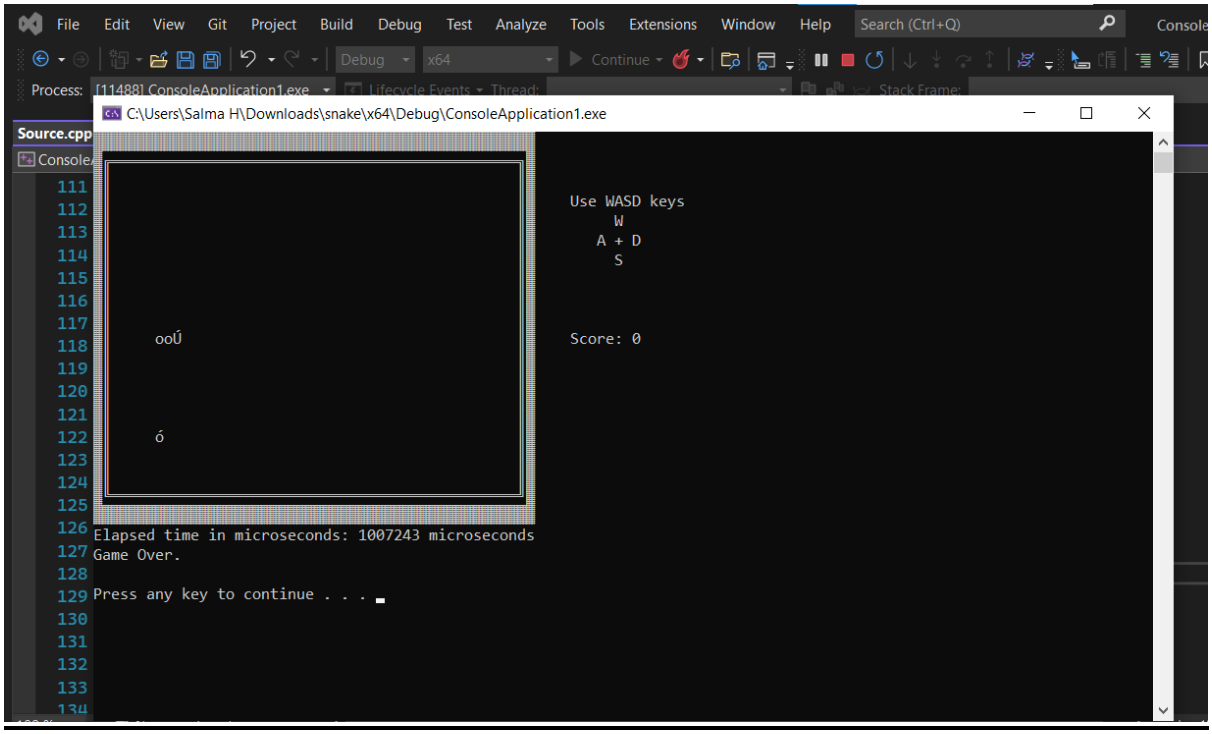
```
cout << "Elapsed time in microseconds: "
            << chrono::duration_cast<chrono::microseconds >(end - start).count()
//calculate execution time
            << " microseconds" << endl;
```

```
int main() {
    auto start = chrono::steady_clock::now();   //get start time
    initialize();
    generate_fruit();

    // Game loop

        update();
        if (_kbhit()) {
            change_direction(_getch());
        }

           (game_over == false);
    auto end = chrono::steady_clock::now();    // get end time
    cout << "Elapsed time in microseconds: "
        << chrono::duration_cast<chrono::microseconds >(end - start).count()   //calculate execution time
        << " microseconds" << endl;

    cout << "Game Over.\n\n";


    system("pause");


    return 0;
}
```

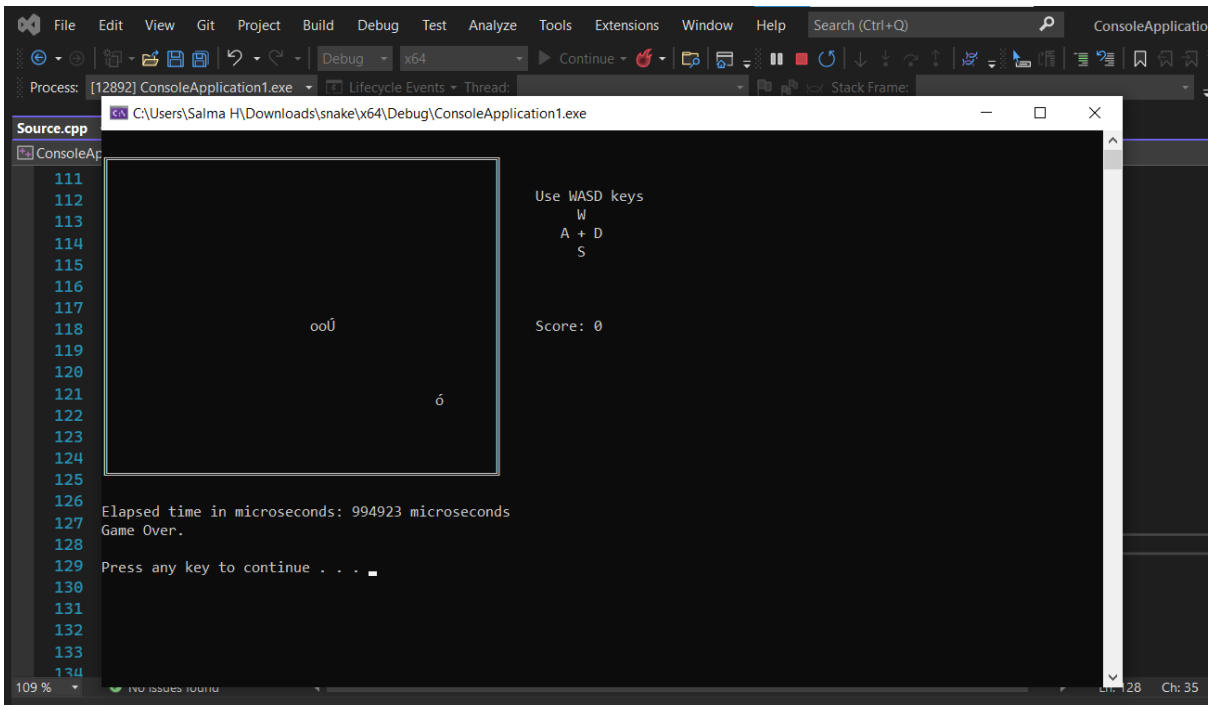
** The function used included in `<chrono>` library

Different Cases to get the Execution time

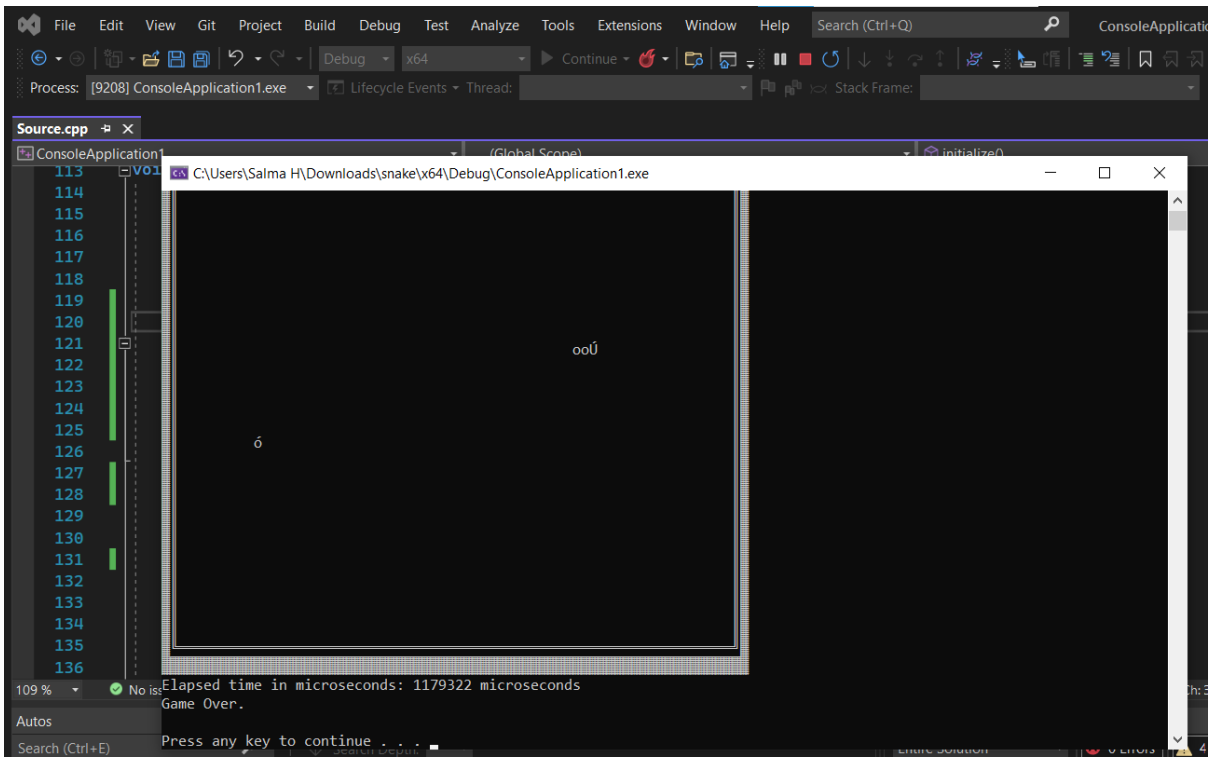
1- Execution time with outer frame, frame size 50x20 = 1007243 microseconds



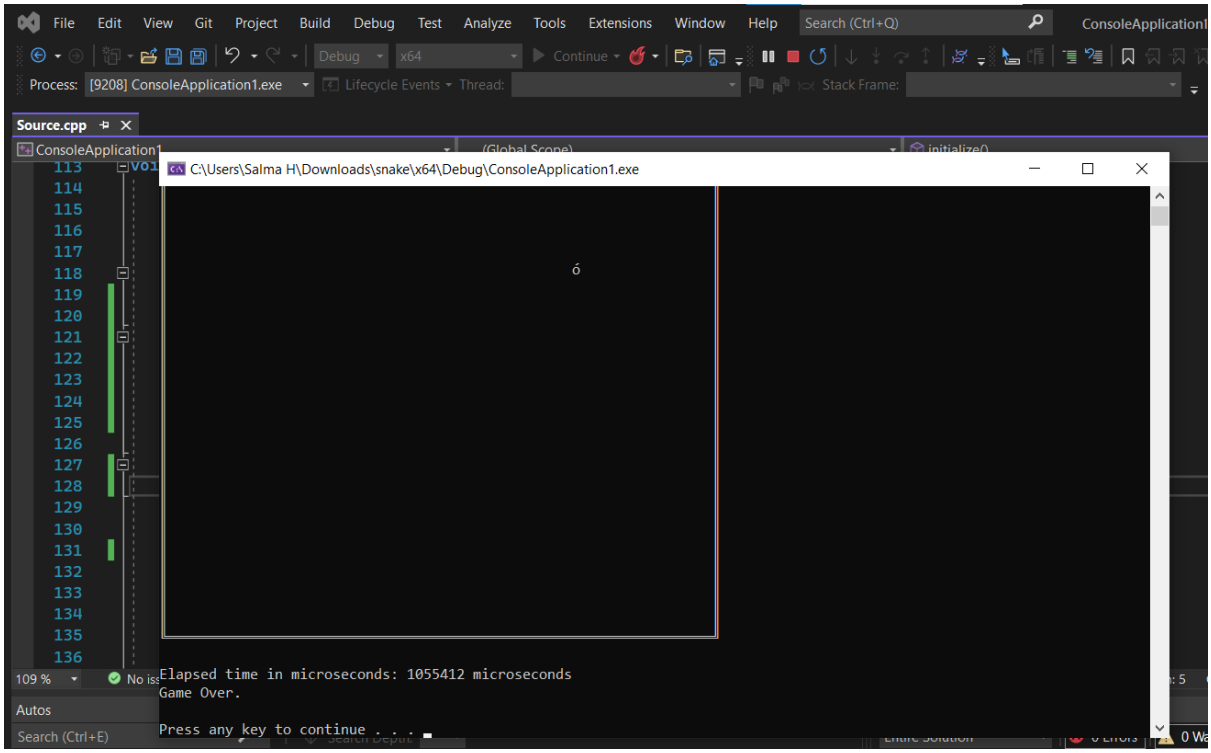
2- Execution time with no outer frame (less loops) frame size 50x20 = 994923 microseconds



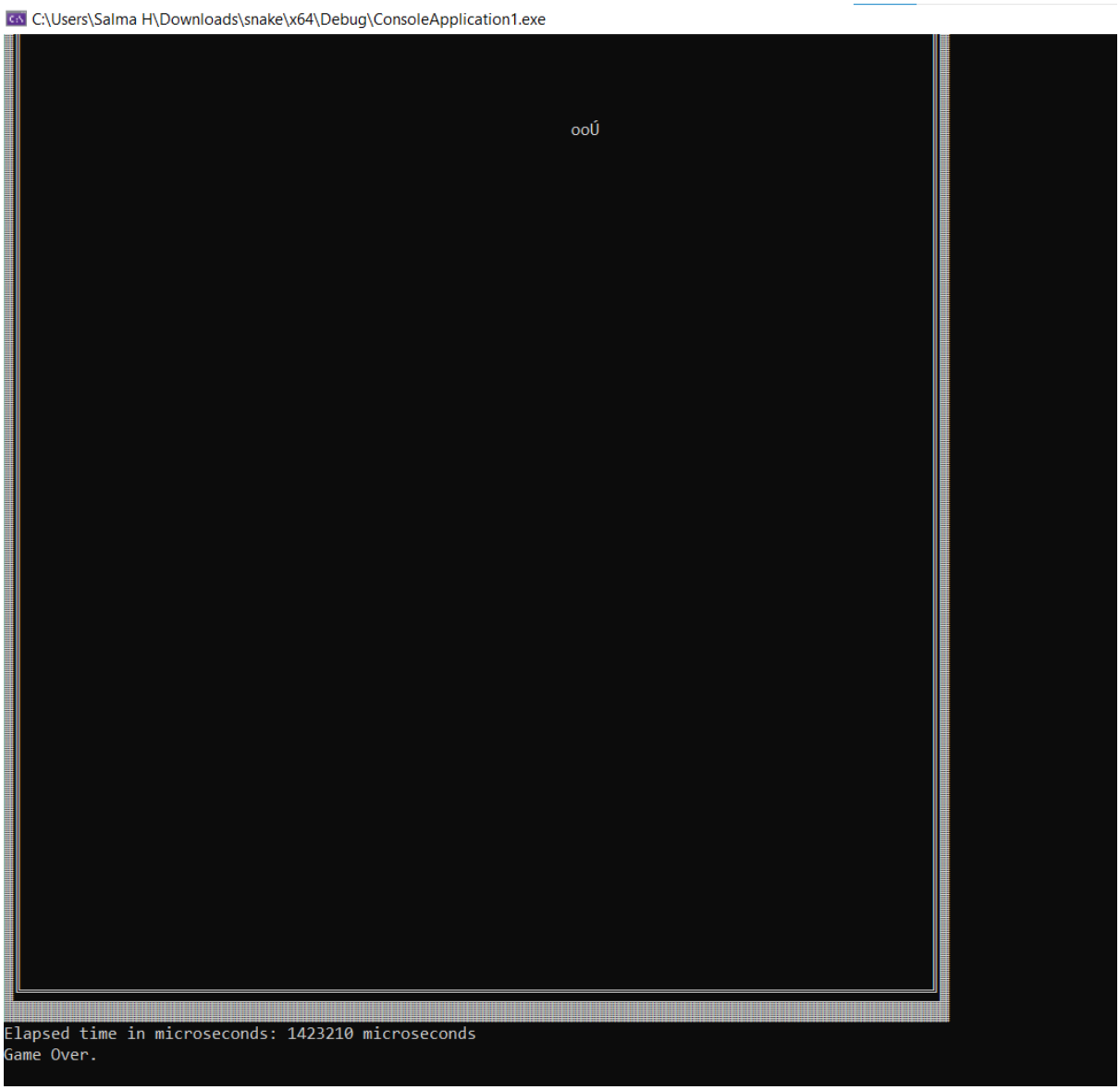
3- Execution time with outer frame and frame size 70x40 = 1179322 microseconds



4- Execution time with no outer frame and frame size 70x40 = 1055412 microseconds



5- Execution time with outer frame and frame size 100x70 = 1423210 microseconds



6- Execution time with no outer frame and frame size 100x70 = 1356601 microseconds