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CS-221

Assignment 1

Question 1,

```
#include <iostream>
using namespace std;

struct UniverseCoordinate
{
    int s-number;
    int x-position;
    int y-position;
    bool is-snake;
};

int main()
{
    UniverseCoordinate ul;
    ul.s-number = 1;
    ul.x-position = 1;
    ul.y-position = 2;
    ul.is-snake = true;

    cout << "snake number: " << ul.s-number << endl;
    cout << "Found at position " << ul.x-position << ", " << ul.y-position << endl;

    return 0;
}
```

Question 2:

```
#include <iostream>
using namespace std;

struct UniverseCoordinate
{
    int s-number;
    int x-position;
    int y-position;
    bool is-snake;
};
```



```

int main ()
{
    int rows = 2, cols = 2;
    UniverseCoordinate → UniverseData = new UniverseCoordinate * (rows);
    for (int i = 0; i < rows; i++)
    {
        UniverseData[i] = new UniverseCoordinate (cols);
        for (int j = 0; j < cols; j++)
        {
            UniverseData[i][j] = {0, j+1, i+1, false};
        }
    }

    int n;
    cout << "Enter no. of snakes:" << endl;
    cin >> n;

    for (int k = 1; k <= n; k++)
    {
        cout << "Enter snake no:" << endl;
        cin >> num;
        cout << "Enter x-coordinate:" << endl;
        cin >> x;
        cout << "Enter y-coordinate:" << endl;
        cin >> y;

        if (x > cols || y > rows)
        {
            int newRows = max(rows, y);
            int newCols = max(cols, x);
            UniverseCoordinate → NewData = new UniverseCoordinate * (newRows);
            for (int i = 0; i < newRows; i++)
            {
                NewData[i] = new UniverseCoordinate (newCols);
                for (int j = 0; j <= newCols; j++)
                {
                    if (i < rows and j < cols)
                        NewData[i][j] = UniverseData[i][j];
                    else
                        NewData[i][j] = {0, j+1, i+1, false};
                }
            }

            for (int i = 0; i < rows; i++) { delete [] UniverseData[i]; }
            delete [] UniverseData;
            UniverseData = NewData;
            rows = newRows;
            cols = newCols;
            UniverseData[y-1][x-1].is_snake = true;
            UniverseData[y-1][x-1].s_number = num;
        }

        cout << "Final Universe:" << endl;
        for (int i = 0; i < rows; i++)
        {
            for (int j = 0; j < cols; j++)
            {
                cout << "(" << UniverseData[i][j].x_position << ", " << UniverseData[i][j].y_position << ") ";
                if (UniverseData[i][j].is_snake)
                    cout << "snake no. << UniverseData[i][j].s_number;
                else
                    cout << "No snake" << endl;
            }
        }

        return 0;
    }
}

```