Course: ENSF 614 - Fall 2023

Lab #:   Lab 4

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Exercise A:

```cpp
String_Vector transpose (const String_Vector& sv) {
    if(sv.empty()){
        return String_Vector();
    }

    int rows = sv.size();
    int cols = sv[0].size();

    String_Vector vs;
    vs.resize(rows);
    for( int i = 0 ; i < rows ; i++ ){
        for( int j = 0 ; j < cols ; j++ ){
            vs.at(j).push_back(sv.at(i).at(j));
        }
    }

    return vs;
}
```

Exercise B:

```cpp
void print_from_binary(char* filename) {
    ifstream InFile(filename, ios::in | ios::binary);
    if (InFile.fail()) {
        cerr << "Failed to open file: " << filename << endl;
        exit(1);
    }

    ofstream OutFile(string(filename) + ".txt");  // Use the filename to create the text file
    if (OutFile.fail()) {
        cerr << "Failed to open file: " << filename << ".txt" << endl;
        exit(1);
    }

    City city;

    while (InFile.read(reinterpret_cast<char*>(&city), sizeof(City))) {
        cout << "City: " << city.name << ", X: " << city.x << ", Y: " << city.y << endl;
        OutFile << "City: " << city.name << ", X: " << city.x << ", Y: " << city.y << endl;
    }

    InFile.close();
    OutFile.close();
}
```
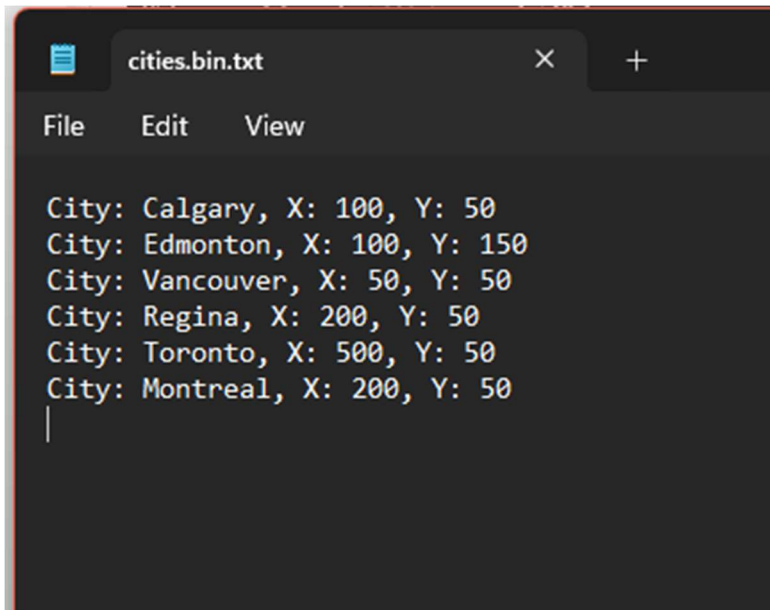
Contents of Generated Text File:

```
cities.bin.txt

File    Edit    View


City: Calgary, X: 100, Y: 50
City: Edmonton, X: 100, Y: 150
City: Vancouver, X: 50, Y: 50
City: Regina, X: 200, Y: 50
City: Toronto, X: 500, Y: 50
City: Montreal, X: 200, Y: 50
```