**Course: ENSF 614–Fall2021**

**Lab #: Lab 4**

**Student Names: Graydon Hall, Jared Kraus**

**Submission Date: 2021-10-19**

# Exercise A

Our code output was this:

Text

Description automatically generated

# Exercise B

Function definition

|  |
| --- |
| */\* File Name: Lab4ExB.cpp*  *\* Lab # and Assignment #: Lab #4 Exercise B*  *\* Lab section: 1*  *\* Completed by: Graydon Hall and Jared Kraus*  *\* Submission Date: 2021-10-19*  *\*/*  String\_Vector transpose (const String\_Vector& sv) {      int sv\_rows = sv.size();      int sv\_cols = sv.at(0).size();      int vs\_rows = sv\_cols;      int vs\_cols = sv\_rows;        String\_Vector vs;      vs.resize(vs\_rows);      for(int i=0; i<vs\_rows; i++){          for(int j=0; j<vs\_cols; j++){              vs.at(i).push\_back(sv.at(j).at(i));          }      }        return vs;    } |

Program Output

Text

Description automatically generated with low confidence

# Exercise C

Function definition

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| */\* File Name: Lab4ExC.cpp*  *\* Lab # and Assignment #: Lab #4 Exercise C*  *\* Lab section: 1*  *\* Completed by: Graydon Hall and Jared Kraus*  *\* Submission Date: 2021-10-19*  *\*/*  void print\_from\_binary(char\* filename) {  *// open input file stream we get cities from*      ifstream is(filename, ios::binary);      if(is.fail()){          cerr << "failed to open file: " << filename << endl;          exit(1);      }  *// output file we will write to*      ofstream ofs("output.txt", std::ofstream::trunc);      if(ofs.fail()){          cerr << "failed to open file: " << filename << endl;          exit(1);      }  *// read cities from input file*      City\* cityHolder;    *// find nummber of cities, help from https://www.cppstories.com/2019/01/filesize/*      int begin = is.tellg(); *// beginning value*      is.seekg (0, ios::end); *// go to end of file*      int end = is.tellg(); *// find end value*      int num\_cities = (end-begin)/sizeof(City); *// total number of cities*      is.seekg (0, ios::beg); *// go to beginning of stream again*  *// read cities from file into array*      cityHolder = new City[num\_cities];      for(int i=0; i<num\_cities; i++){          is.read((char\*)(&cityHolder[i]), sizeof(City));      }  *// write to ouptput file*      for(int i=0; i< num\_cities; i++){          cout << "Name: " << cityHolder[i].name << ", x coordinate: "          << cityHolder[i].x << ", y coordinate: " << cityHolder[i].y << endl;            ofs << "Name: " << cityHolder[i].name << ", x coordinate: "          << cityHolder[i].x << ", y coordinate: " << cityHolder[i].y << endl;      }  *// close our files*      is.close();      ofs.close();  } |

The content of our generated text file (called output.txt)

Text, letter

Description automatically generated