

Programming Fundamental - ENSF 337

Lab 9

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B01

November 28, 2019

EXERCISE B

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

    City x[100];
    int n;

    stream.seekg(0L, ios::end);

    n = stream.tellg()/sizeof(City);

    stream.seekg(0L, ios::beg);

    stream.read((char*)x, sizeof(City)*n);
    stream.close();

    for(int i = 0; i < n; i++)
        cout << "Name: " << x[i].name << ", x coordinate: " << x[i].x << ", y c
coordinate: " << x[i].y << endl;
}
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exB
$ g++ -Wall lab9ExB.cpp
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exB
$ ./a.exe
```

The content of the binary file is:

```
Name: Calgary, x coordinate: 100, y coordinate: 50
Name: Edmonton, x coordinate: 100, y coordinate: 150
Name: Vancouver, x coordinate: 50, y coordinate: 50
Name: Regina, x coordinate: 200, y coordinate: 50
Name: Toronto, x coordinate: 500, y coordinate: 50
Name: Montreal, x coordinate: 200, y coordinate: 50
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exB
$
```

EXERCISE C

```
String_Vector transpose (const String_Vector& sv) {  
    int row = sv.size();  
    int column = sv.at(0).size();  
  
    String_Vector vs;  
    vs.resize(column);  
  
    for(int i = 0; i < column; i++)  
        for(int j = 0; j < row; j++)  
            vs.at(i).push_back(sv.at(j).at(i));  
  
    return vs;  
}
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exc  
$ g++ lab9Exc.cpp
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exc  
$ ./a.exe
```

ABCD

EFGH

IJKL

MNOP

QRST

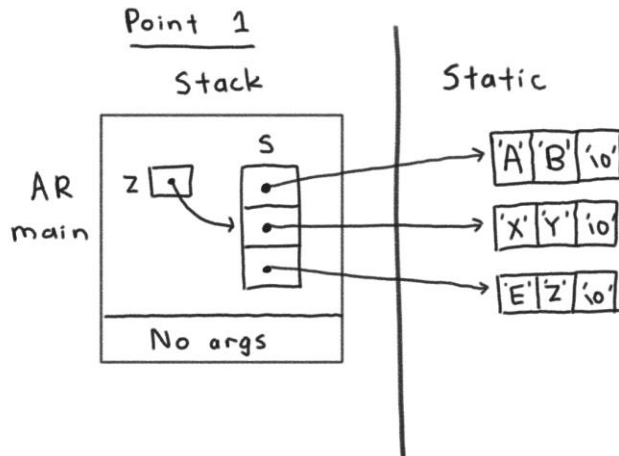
AEIMQ

BFJNR

CGKOS

DHLPT

EXERCISE D



```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exD
$ g++ -Wall lab9ExD.cpp
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exD
$ ./a.exe
```

```
The value of **z is: X
The value of *z is: XY
The value of **(z-1) is: A
The value of *(z-1) is: AB
The value of z[1][1] is: Z
The value of *(*z+1)+1) is: Z
Here is your array of integers before sorting:
413
282
660
171
308
537
```

```
Here is your array of ints after sorting:
171
282
308
413
537
660
```

```
Here is your array of strings before sorting:
Red
Blue
pink
apple
almond
white
nut
Law
cup
```

```
Here is your array of strings after sorting:
Blue
Law
Red
almond
apple
cup
nut
pink
white
```

Exercise E

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exE
$ g++ matrix.cpp lab9ExE.cpp -o matrix
```

```
jaych@DESKTOP-DILG265 /cygdrive/c/ensf337/lab9/exE
$ ./matrix.exe 3 4
```

The values in matrix m1 are:

| | | | |
|-----|-----|-----|-----|
| 2.3 | 3.0 | 3.7 | 4.3 |
| 2.7 | 3.3 | 4.0 | 4.7 |
| 3.0 | 3.7 | 4.3 | 5.0 |

The values in matrix m2 are:

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| 2.7 | 3.3 | 4.0 | 4.7 | 5.3 | 6.0 |
| 3.0 | 3.7 | 4.3 | 5.0 | 5.7 | 6.3 |
| 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | 6.7 |
| 3.7 | 4.3 | 5.0 | 5.7 | 6.3 | 7.0 |

The new values in matrix m1 and sum of its rows and columns are

| | | | | | | | |
|-------|------|------|------|------|------|--|------|
| 2.7 | 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | | 26.0 |
| 3.0 | 3.7 | 4.3 | 5.0 | 5.7 | 6.3 | | 28.0 |
| 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | 6.7 | | 30.0 |
| 3.7 | 4.3 | 5.0 | 5.7 | 6.3 | 7.0 | | 32.0 |
| ----- | | | | | | | |
| 12.7 | 15.3 | 18.0 | 20.7 | 23.3 | 26.0 | | |

The values in matrix m3 and sum of its rows and columns are:

| | | | | | | | |
|-------|------|------|------|------|------|--|------|
| 5.0 | 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | | 28.3 |
| 3.0 | 15.0 | 4.3 | 5.0 | 5.7 | 6.3 | | 39.3 |
| 3.3 | 4.0 | 25.0 | 5.3 | 6.0 | 6.7 | | 50.3 |
| 3.7 | 4.3 | 5.0 | 5.7 | 6.3 | 7.0 | | 32.0 |
| ----- | | | | | | | |
| 15.0 | 26.7 | 38.3 | 20.7 | 23.3 | 26.0 | | |

The new values in matrix m2 are:

| | | | | | | | |
|-------|-------|-------|------|------|------|--|------|
| -5.0 | 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | | 18.3 |
| 3.0 | -15.0 | 4.3 | 5.0 | 5.7 | 6.3 | | 9.3 |
| 3.3 | 4.0 | -25.0 | 5.3 | 6.0 | 6.7 | | 0.3 |
| 3.7 | 4.3 | 5.0 | 5.7 | 6.3 | 7.0 | | 32.0 |
| ----- | | | | | | | |
| 5.0 | -3.3 | -11.7 | 20.7 | 23.3 | 26.0 | | |

The values in matrix m3 and sum of its rows and columns are still the same:

| | | | | | | | |
|-------|------|------|------|------|------|--|------|
| 5.0 | 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | | 28.3 |
| 3.0 | 15.0 | 4.3 | 5.0 | 5.7 | 6.3 | | 39.3 |
| 3.3 | 4.0 | 25.0 | 5.3 | 6.0 | 6.7 | | 50.3 |
| 3.7 | 4.3 | 5.0 | 5.7 | 6.3 | 7.0 | | 32.0 |
| ----- | | | | | | | |
| 15.0 | 26.7 | 38.3 | 20.7 | 23.3 | 26.0 | | |