San José State University
Department of Computer Engineering

CMPE 180-92
Data Structures and Algorithms in C++

Fall 2016
Instructor: Ron Mak

Assignment #5B

Assigned: Friday, September 23
Due: Friday, September 30 at 11:59 PM
URL: http://codecheck.it/codecheck/files/1609262412ef8zb7r7fb7wdq8umbhj3e38w
(Revised version with `'\n'` line endings in input file **widgets.txt**.)
Canvas: Assignment 5.b. Widget Report
Points: 100

Widget Report

This assignment will give you practice implementing a C++ class. Class **`WidgetReport`** will print a Widget Report from an input file of widgets data.

Sample input file

Your program should read an input file **widgets.txt** containing widgets data:

```
STATE,PLANT,DEPT,EMPID,NAME,COUNT
12,34,56,789,George Carter,4
12,34,56,799,Mary Clinton,6
12,34,57,639,Alfred Lincoln,8
12,40,57,710,Kim Kennedy,8
12,40,57,990,Jina Johnson,6
12,40,75,426,Ruby Roosevelt,10
12,40,75,551,John Washington,7
33,22,11,297,Hilda Hoover,10
33,22,11,428,Ted Truman,11
33,22,11,808,Nora Nixon,3
33,22,14,629,Mabel Bush,9
33,27,19,321,Chris Adams,5
```

The first input line contains column headers for the report. Subsequent input lines each contains detail information about an employee: state code, plant (factory) code, department code, employee ID, name, and the count of widgets the employee made. The plants in a state are separate from the plants of another state, and the departments

in a plant are separate from the departments of another plant. (Department 57 in Plant 34 is separate from Department 57 in Plant 40.)

You may assume that the input file contains no errors, and that the detail lines are already sorted first by state, then by plant, then by department, and finally by employee id.

Download the complete input file **widgets.txt**:
http://www.cs.sjsu.edu/~mak/CMPE180-92/assignments/5B/widgets.txt
This file is already uploaded to CodeCheck.

`class WidgetReport`

Your **`WidgetReport`** class should have a constructor that takes an opened input file stream as a parameter. The constructor should initialize all the member variables. The class should have a print member function that prints the Widget Report.

Your class should do all the work of reading the input file and printing the report. Do not store the entire input file into a giant array or vector. Your class would then not scale – what if the input consists of thousands of lines? It should be able to generate the report line-by-line as it reads the input file line-by-line.

Make the class an ADT. Make public only what is necessary for someone to use your class.

Your program should have no global variables. Global constants are OK.

Rubrics

Criteria	Maximum points
Good program output (as determined by CodeCheck) • Correct totals. • Report generated line-by-line as input read line-by-line.	**20** • Totals: 10 • Line-by-line: 10
Class design • Abstract data type: good public/private choices. • Well-written constructor. • Well-written print member function. • Well-chosen member variables. • Well-chosen member functions. • Proper declaration of a **`WidgetReport`** object.	**60** • ADT: 10 • Constructor: 10 • Print: 10 • Variables: 10 • Functions: 10 • Object: 10
Good program style • Declarations before the main, definitions after. • Consistent statement indentations and placement of braces.	**20** • Before/after main: 10 • Consistent: 10

You can submit as many times as necessary to get satisfactory results, and the number of submissions will not affect your score. When you're done with your program, click the "Download" link at the very bottom of the Report screen to download a signed zip file of your solution.

Submit the signed zip file into **Canvas: Assignment 5.b. Widget Report**.

Expected output

The following shows the expected output format for the sample input file:

```
STATE  PLANT  DEPT  EMPID  COUNT  NAME

   12     34    56    789      4  George Carter
   12     34    56    799      6  Mary Clinton

                              10  TOTAL FOR DEPT  56 *

   12     34    57    639      8  Alfred Lincoln

                               8  TOTAL FOR DEPT  57 *
                              18  TOTAL FOR PLANT 34 **

   12     40    57    710      8  Kim Kennedy
   12     40    57    990      6  Jina Johnson

                              14  TOTAL FOR DEPT  57 *

   12     40    75    426     10  Ruby Roosevelt
   12     40    75    551      7  John Washington

                              17  TOTAL FOR DEPT  75 *
                              31  TOTAL FOR PLANT 40 **
                              49  TOTAL FOR STATE 12 ***

   33     22    11    297     10  Hilda Hoover
   33     22    11    428     11  Ted Truman
   33     22    11    808      3  Nora Nixon

                              24  TOTAL FOR DEPT  11 *

   33     22    14    629      9  Mabel Bush

                               9  TOTAL FOR DEPT  14 *
                              33  TOTAL FOR PLANT 22 **

   33     27    19    321      5  Chris Adams

                               5  TOTAL FOR DEPT  19 *
                               5  TOTAL FOR PLANT 27 **
                              38  TOTAL FOR STATE 33 ***

                              87  GRAND TOTAL        ****
```