**Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_Juisheng Hung\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Fill the following table with your solution:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Executable size without using –g :** 171876 bytes | | | | **Why?** | |
| **Executable size when using –g :** 302852 bytes | | | |
| Reason:   1. When we use the “-g” flag, the compiler includes additional information for “debugging symbols” inside the executable file. This makes the debugger include information about the program’s structure and the location of variables, functions, and others. That’s why it will have a larger executable size. 2. When we use the “-O0” flag, it means not doing any optimization on the code when compiling. When we use higher flags such as “-O1” or “-O3”, the compiler will remove unnecessary instructions or data when compiling, which causes longer time and more memory when compiling, but speeds up the executable’s efficiency. In conclusion, no optimization will result in a larger executable size. | | | | | |
| **The original output before debugging:**  Here is the List of all the Staff in the R&D Department:  ------------------------------------------------------------  Name ID Title Salary Year Hired Supervisor ProjectID Prog.Lang. #Exp Years  Josh 0 3000.00 2015  Mary 0 5500.00 2010  Marc 0 8000.00 2007  Mike 0 2500.00 2014  Julie 0 2150.00 2013  Albert 0 2300.00 2015  John 0 4899.00 2011  Connor 0 1900.00 2017  Here is the List of all the Staff in the IT Department:  ------------------------------------------------------------  Name ID Title Salary Year Hired Supervisor ProjectID Prog.Lang. #Exp Years  Removing Mike from the company: Succeeded  -------------------------------  Name ID Title Salary Year Hired Supervisor ProjectID Prog.Lang. #Exp Years  Mary 0 5500.00 2010  Julie 0 2150.00 2013  Connor 0 1900.00 2017  Here is the List of all the Programmers who know C++ in the R&D Department:  ---------------------------------------------------------------------------  Name ID Title Salary Year Hired Supervisor ProjectID Prog.Lang. #Exp Years  Julie 0 2150.00 2013 Mary 5 C++  Listing All Project IDs:  -------------------------  The Highest R&D Employee Salary is: 5500.00  The Highest R&D Programmer Salary is: 2150.00  The Highest R&D Software Architect Salary is: 1900.00  The Average R&D Employee Salary is: 5500  The Average R&D Programmer Salary is: 2150  The Average R&D Software Architect Salary is: 1900  The Average IT Employee Salary is: 0  The Average IT Programmer Salary is: 1700  The Average IT Software Architect Salary is: 0  Comparing with the expected output:  1. ID shouldn’t be all ‘0’s  2. the Titles, Supervisors, ProjectID, Prog.Lang., #Exp Years didn’t generate  3. the previous effected the related stats (List all project IDs, and salary statistics). | | | | | |
| **Bug #** | **Details** | | | **Proposed solution** | |
| File, line | Function name | Description | Description | Modified code |
| **1** | Department.cpp:143 | Department::RemoveEployee(Employee E) | Showed “if statement has empty body” while compiling | Redundant ‘;’ caused syntax error. Just delete it. | if (E.getID() == Programmers->at(i).getID()) |
| **2** | Department.cpp:162 | Department::getAllProjectIDs() | Showed “expression result unused” while compiling | Didn’t initialize the value of the variable inside for loop. Add ‘ = 0’ after it | for (i = 0; i < Programmers->size(); i++) |
| **3** | Department.cpp:170 | Department::getAllProjectIDs() | Showed “expression result unused” while compiling | Didn’t initialize the value of the variable inside for loop. Add ‘ = 0’ after it | for (i = 0; i < SoftwareArchitects->size(); i++) |
| **4** | Main.cpp:67 | Main() | Variable uninitialized | Didn’t initialize the value of the variable inside for loop. Add ‘ = 0’ after it | for (unsigned i = 0; i < AllITEmployees->size(); i++) |
| **5** | employeeClass.cpp:13  employeeClass.cpp:18 | Employee::Employee (string nme, long id, string jobTitle, double slry, int yr) | Caused instances member variables initializing failure – no ‘Job Title’ | Solve conflict variable name (differ from the member variable’s name) | Employee::Employee(string nme, long id, string jobtitle, double slry, int yr) {  jobTitle = jobtitle; |
| **6** | employeeClass.cpp:16 | Employee::Employee (string nme, long id, string jobTitle, double slry, int yr) | All id equals to 0 | The if statement is reversed, should be initialized when id > 0 | (id > 0) ? ID = id : ID = 0; |
| **7** | employeeClass.h:30 | Employee:: print() | There are values of supervisorName and ProjectID for instances but results were not printed. | Print() functions for the subclasses were overloaded but when calling it in the main, it didn’t do as expected. Found missing keyword ‘virtual’ for print() in the parent class. | virtual void print(); |
| **8** | main.cpp:98 - 102 | Main() | Printed Porject IDs are not sorted | Sort before print, insert before the for loop | std::sort(AllProjects->begin(), AllProjects->end()); |