

**Lab report**

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| **Course**: | Class Libraries and Data Structures |
| **Semester**: | 1st semester of the academic year **2019-2020** |
| **Major**: | Software Engineering |
| **Class**: | 2018 |
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**School of Computer and Information Science**

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| Name | | Review of C++ | | | |
| Date | | Sep. 5，2019 | Type | | √ Confirmatory  √ Design  □Comprehensive |
| 1. **Objective & Requirements**    1. Review the concepts of class, object, inheritance, overriding and overloading in the C++ programming language    2. Learn the Data Abstraction Principle, the Open-Closed Principle, and the Subclass Substitution Rule    3. Practice C++ programming skills | | | | | |
| 1. **Experimental environment (**platform and software**)**   Windows 7 (or higher versions) + Visual Studio 2010 (or higher versions) | | | | | |
| 1. **Experimental content and design** (Main Content, Procedure, Codes and Results) 2. Task 1    1. Declare and define the Employee and Company classes. The requirements are as stated in the slides;    2. Declare and define the Employee and Company classes for the case of hourly paid employee by using inheritage. The requirements are as stated in the slides and specified in the given source files:       1. Implement the input() method for the derived Employee2 class       2. Implement the findBestPaid() method for the derived Company2 class    3. Test your classes implementation to get and output the best paid employee | | | | | |
| 1. **Result analysis and discussion**（Analysis of experimental results and summing up the harvest and the existing problems）   首先Employee这个类中有name和grossPay两个protected类型的变量，即只有自己和派生类可以访问。Company这个类中有一个Employee类型的变量bestPaid，同样只能被自己和派生类访问。  Employee2是Employee的一个派生类，它有两个私有变量month和monthlySalary，又因为它是Employee的一个派生类，所以可以调用name和grossPay两个protected变量。所以我们可以在Employee2的input（）方法中输入赋值私有变量month和monthlySalary还有基类中的变量name，同时计算得到grossPay。  在Company2的类中不能再直接访问name、grossPay、month和monthlySalary四个变量，于是定义一个Employee2类型的过程变量temp，临时储存每次从键盘输入的信息。又因为Company2是Company的一个派生类，所以可以调用基类中的bestPaid，将当前最大的收入和姓名存入其中。  findBestPaid()函数主要是一个循环，循环的终止条件是当前输入name为“\*”，循环内有一个判断，将当前输入的Employee2类型的temp和Employee类型的bestPaid比较，看似两个参数类型不同，但实则比较的是两个参数中的grossPay变量，如果temp较大，则将name和grossPay复制到bestPaid。  First, the Employee class has two protected variables, name and grossPay, which are accessible only to itself and derived classes. The Company class has a variable of type Employee, bestPaid, which can only be accessed by itself and derived classes.  Employee2 is a derived class of Employee that has two private variables, month and monthlySalary, and because it is a derived class of Employee, you can call the name and grossPay protected variables. So in the input() method of Employee2, we could enter the assignment private variables month and monthlySalary, as well as the name of the variable in the base class, and evaluate grossPay.  The Company2 class can no longer directly access the four variables name, grossPay, month, and monthlySalary, so a procedure variable of type Employee2, called temp, is defined to temporarily store information entered from the keyboard each time. Because Company2 is a derived class of Company, you can call bestPaid in the base class to store the current maximum income and name.  The findBestPaid() function is mainly a loop, and the termination condition of the loop is that the current input name is "\*". There is a judgment in the loop to compare the current input temp of type Employee2 and bestPaid of type Employee. It seems that the two parameters are different, but in fact, it is the grossPay variable in the two parameters. If the temp is large, copy the name and grossPay to bestPaid.  附代码：  company2.cpp    employee2.cpp    运行结果： | | | | | |
| Comments & Evaluation | Content & Design (A-E) | | |  | |
| Procedure & Codes (A-E) | | |  | |
| Results (A-E) | | |  | |
| Analysis & Discussion (A-E) | | |  | |
| Score (A-E):  Feedback comments: | | | | |