

Inheritance and Classes

Lab 9

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for ELEC 3150
Professor Carpenter - Fall 2016

I - Introduction

The goal of this lab was to demonstrate the functionality and usefulness of derived classes. To accomplish this, a person class was used as a base class for a student class and the student class was used as a case class for an intern class. The person class stores information that every person has including name, age, and home city. The student class contains the information in the person class in addition to school name, class year, and graduation date. The intern class stores the information in the student class in addition to company name, pay, and date of job completion. Each class includes standard class constructors, destructors, set functions, get functions, and a print function. Student and interns additionally have a vector field that stores skills.

II - Procedure

To create the series of derived and base classes, first the most base level class was written to include a virtual print function so that the student class print function could override this function. The next most basic class, the student class was written. The student class was also written to include a virtual print function, in the same way as the person class was, so that the intern class could override the print function.

The skills list was constructed using the vector template which dynamically allocates memory, allows values to be pushed to the back, provides simple indexing, and provides the number of list elements which was used in for loops for simple element traversal in a for loop.

III - Results

```
Prof Carpenter
  Age: 103
  Homecity: Badlands - TrumpTownUSA
```

Figure 1: Console output of the person class.

```
Matt Bennett
  Age: 5
  Homecity: LandOfShouldveAppliedAlready
    School: WIT
    Class year: 3
    Grad date: 2300.08
    Skills: Unemployment, Random useless factoids, Being unfashionably late, Putting foot in mouth at important times disorder,
```

Figure 2: Console output of the student class.

```
Mr. Got it Together
  Age: 25
  Homecity: RealityTown
    School: WIT
    Class year: 4
    Grad date: 2250.08
    Skills: Having a job, Knowing useful things, Being on time,
      Company: ExchangesGood&ServicesFor$$$Co
      Hourly pay: 100
      End date: 2300.01
```

Figure 3: Console output of the intern class.

IV - Analysis

Each class is successfully constructed and destructed, with print functions properly overriding base class virtual print functions, and skills properly added to the skill list in both the student and intern classes. Figures 1 through 3 in the results section demonstrate the verification of the person, student, and intern classes respectively.

V - Conclusions

The program functions as expected generating a person, student, and intern object within the main function. Additionally, the student and intern objects both have skills added to their vector skills. The print function of each constructed object is then run to verify object behavior and element access. The results of this print functions verifying both the creation of the objects and the print function overriding of the derived classes is shown in Figures 1 through 3. The output verifies that the base and derived classes function together as expected.