

**CS360 Concepts of object oriented programming - Midterm Exam (120 minutes)**

Internet connection prohibited during examination

1) (25 pts) How does object-oriented programming differ from procedural programming?

2) (35 pts) Write a class named MonthDays. The class's constructor should accept two arguments:

- An integer for the month (1=January, 2 February, etc.).
- An integer for the year

The class should have a method named getNumberOfDays that returns the number of days

in the specified month. The method should use the following criteria to identify leap years:

1. Determine whether the year is divisible by 100. If it is, then it is a leap year if and if only it is divisible by 400. For example, 2000 is a leap year but 2100 is not.

2. If the year is not divisible by 100, then it is a leap year if and if only it is divisible by 4. For example, 2008 is a leap year but 2009 is not.

Demonstrate the class in a program that asks the user to enter the month (letting the user enter an integer in the range of 1 through 12) and the year. The program should then display the number of days in that month. Here is a sample run of the program:

Enter a month (1-12): 2 [enter]

Enter a year: 2008 [enter]

29 days

3) (40 pts) Create a class called **Invoice** that a hardware store might use to represent an invoice for an item sold at the store. An **Invoice** should include four data members—a part number (type string), a part description (type string), a quantity of the item being purchased (type int) and a price per item (type double). Your class should have a constructor that initializes the four data members. Provide a *set* and a *get* function for each data member. In addition, provide a member function named **getInvoiceAmount** that calculates the invoice amount (i.e., multiplies the quantity by the price per item), then returns the amount. If the quantity is not positive, it should be set to 0. If the price per item is not positive, it should be set to 0. Write a test program that demonstrates class **Invoice**'s capabilities by creating the objects corresponding to the following data:

INV0100, Laptop IBM, 3, 1920.5

INV0101, Mouse Logitech, 10, 24.6

Display the amount of each invoice and the total amount of money gotten by the store.