American University of Science & Technology

Department of Computer Science

**CSI 311L – Java Programming Lab**

**Spring 2011/2012**

**Lab Work 10**

**Problem1:**

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| Employee | |
| Attributes | * **ID**: an integer to identify each employee. * **fname**: a String . * **lname**: a String. * **rank**: an integer to classify an employee position that can be assigned only the values 1,2, or 3. |
| Methods | * **constructor** (no default constructor). * **Set, get.** * **toString** |

|  |  |
| --- | --- |
| Teacher | |
| Note that a teacher is an employee. | |
| Attributes | * **hours:** an integerto store the number of hours taught by a teacher. * **Count**: to count all teachers. * **totalsalary**: an integer that is shared by all objects of the class Teacher. It should accumulate the value of all teachers’ salaries. |
| Methods | * **constructor**. * **Calculate\_salary :**  return the salary of a teacher. Note that the salary is equal to:   -hours \* 75000 if rank =1.  -hours \* 50000 if rank =2.  -hours \* 40000 if rank =3.   * **get\_totalsalary:** returns the value of totalsalary. * **Set, get.** * **toString** |

II- Write a driver program to instantiate N objects of the class Teacher. You should output the information about the teacher with the highest salary.

Write an application to test your classes’ implementations.

**Problem 2:**

## I- Write an inheritance hierarchy that enables polymorphism for the following classes’ specification:

**Item:** an abstract base class defined as follows:

*Attributes (*declared as private)*:*

1. Code: an integer to identify a purchased item
2. Name: A string to store the item name.
3. Total\_price: to accumulate the prices of all items.

*Methods:*

1. Constructor.
2. Display\_name( ): an abstract method.
3. To String: to display the attribute using the following format:

Name: Printer **Code:1189**

1. Get\_price( ): an abstract method.

**Purchased\_Item:** a concrete class derived from Item.

*Attributes (*declared as private)*:*

1. Cost: a number to determine the purchasing cost.
2. Supplier\_name: a String for the supplier name.
3. Kind: can be set only for the values 1 or 2.

*Methods:*

1. *Constructor (no default value).*
2. Display\_name( ): output the class name.
3. Print: to display the attribute using the following format:

Name: Printer **Code:1189**

**Supplier\_name: WUG company.**

**Price: $150.**

1. Get\_price(): return the cost of a purchased item + 2% for Kind = 1 and 3%

otherwise.

**Manufactured\_Item:** a concrete class derived from the Item class:

*Attributes (declared as private):*

1. Code: an integer to identify a manufactured item.
2. Year: an integer to specify the manufacturing year.
3. Cost: a number to determine the manufacturing cost*.*

*Methods:*

1. *Constructor(no default value).*
2. Display\_name():to output the class name.
3. Print():to display the attribute using the following format:

## Name: Computer\_table code : 4412

**Year: 2003.**

**Price: $350.**

Get\_price(): return the cost of a manufactured item + 1% tax.

II- Write a program to enable the user to store the data about N items. The input for each item should be provided from the keyboard using a scanner object. The program should output the following information:

* List all purchased item with price > $500
* Output the total price of all items.