LaSalle College
Montréal

Midterm Exam: 30%

Course Identification

Name of programs – Codes:	COMPUTER SCIENCE TECHNOLOGY - VIDEO GAME PROGRAMMING (420.BX)
Course title:	**DATABASE DEVELOPMENT**
Course number:	420-B35-AS
Group:	07130
Teacher's name:	Ramiro Guerreiro
Duration:	Extended
Semester:	Fall 2020

Student Identification

Name: _____ Student number: _____

Date: _____ Result: _____

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Standard of the Evaluated Competencies

Statement of the evaluated competencies – Codes

Use an object-oriented development approach – 016T

Evaluated elements of the competency

1. Create an object model.
2. Refine the object model.
3. Program a class.
4. Ensure that the class functions correctly.
5. Generate the executable version of the program.

Instructions

- No break is allowed in this exam. Students are not allowed to exit the examination room before half of the allotted time has passed. Once a student has exited the classroom, he or she may not re-enter. (PIEA – Article 5.12.4)
- Internet access is not allowed during the exam.
- Students are allowed to use their laptops.
- Students must submit SECTION I to continue the exam with SECTION II.
- The teacher may not answer questions during the exam.
- Students must keep silent during the exam time.
- It is the teacher's responsibility to identify language errors. If such errors are found, the teacher has the right to apply a penalty of up to 10% of the grade. (PIEA – Article 5.7)
- Plagiarism, any attempt at plagiarism or complicity in plagiarism during an evaluation representing 20% and more of the final grade, will result in a course failure. (PIEA – Article 5.16)
- Wait for the teacher's signal before turning this page.

Mark Breakdown

This examination is calculated on 100 points distributed as follows:

- Question 1: For a total of 40 points
- Question 2: For a total of 60 points

TOTAL : 100

Directions:

For each question, create an Eclipse project named "MidTermQn" where n is the number of the question. In each question, you must create a small main (class and function) to perform a very basic test on your classes.

At the end of the exam, zip all those project folders into one zip file and upload it into the LEA assignment for Midterm Exam.

Question 1: (40 points)

Correctly code the following classes and methods:

The class Starfleet has two **static** internal classes: Captain and Vessel.

1. Each captain has a name and the name of the vessel he or she is commanding. The constructor of the class Captain must have a parameter (name) and leave the name of the vessel blank. The class Captain must have getters for the captain's name and the name of vessel under his / her command.

2. Each vessel has a name, a type ("stellar base" or "ship") and the name of the captain who commands it. The constructor of the class Vessel must have two parameters (type and name) and leave the captain's name blank. The class Vessel must have getters for the vessel's name, vessel's type and its captain's name.

3. The class Starfleet has a method for assigning a captain to a vessel.

4. The class Starfleet has a list (memory) of all its captains and a list (memory) of its active vessels.

5. The class Starfleet has an overloaded method to remove a captain or a vessel from its respective list (memory). When removing a captain, his/her name must be removed from the vessel he/she was commanding. When removing a vessel, its name must be removed from the captain who was commanding it.

6. Create a class Main to verify that your class Starfleet works properly.

Examples:

Captain "Jean-Luc Picard" commands the vessel "Enterprise".

The vessel "Enterprise" is of type "ship" and it is commanded by Captain "Jean-Luc Picard"

The vessel "Deep Space 9" is of type "stellar base" and it is commanded by Captain "Benjamin Sisco".

The vessel "Voyageur" is of type "ship" and it is commanded by Captain "Katherine Janeway"

Question 2: (60 points)

You must code an Employee class for a HR system. Objects in this class must have attributes:

1. id – an positive integer that is an unique identifier of the employee
2. name – the emplyee's family name
3. givenName - the emplyee's given name
4. salary – a double greater or equal to 0.

Remark: The name and the givenName must contain only lowercase and uppercase latin letters, space or "-".

A. The attributes id, name and givenName must be **immutable**.

B. Four cases of exceptions must be correctly thrown by the class:

EmployeeDataException code 1 – invalid id (id less or equal to zero)

EmployeeDataException code 2 – invalid name

EmployeeDataException code 3 – invalid givenName

EmployeeDataException code 4 – invalid salary (salary less than zero)

The EmployeeDataException must have the appropriate message for each case.

C. The class must be usable with Java collections, such as TreeSet.

The default order between objects is the standard order of id as integers.

Two secondary orders must be provided:

C.1. Alphabetic order by name and first name and then id.

C2. Salary and then id.

D. Create a class Main to verify that your class Employee works properly.