



## Final Evaluation: 40%

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### Course Identification

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Name of programs – Codes:	COMPUTER SCIENCE TECHNOLOGY - VIDEO GAME PROGRAMMING (420.BX)
Course title:	<b>DATABASE DEVELOPMENT</b>
Course number:	420-B35-AS
Group:	07130
Teacher's name:	Ramiro Guerreiro
Duration:	<b>Extended</b> (24 hours)
Semester:	Fall 2020

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### Student Identification

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Name: \_\_\_\_\_ Student number: \_\_\_\_\_

Date: \_December 11<sup>th</sup>, 2020\_\_\_\_\_ Result: \_\_\_\_\_

☐ I declare that this is an original work, and that I credited all content sources of which I am not the author (online and printed, images, graphics, films, etc.), in the required quotation and citation style for this work.

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### Standard of the Evaluated Competencies

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#### Statement of the evaluated competencies – Codes

**Competency:** Develop transactional Web applications - 00SU

#### Evaluated elements of the competency

3. Prepare the database.
5. Program the server-side application logic.
7. Control the quality of the application.

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## Instructions

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- Class notes, mobile phones and Internet access are **not** allowed during the exam.
- Students **must** submit PART I to continue the exam with PART II.
- Students are allowed to use their laptops during PART II.
- 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)
- 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.

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## Mark Breakdown

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This examination is calculated on 100 points distributed as follows:

Case Study: Development a Java and Swing application project using Object Orientation, DataBase and GUI.

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|--------------|-----------|
| • Question 1 | 30 points |
| • Question 2 | 30 points |
| • Question 3 | 40 points |

**TOTAL: 100 POINTS**

Instructions:

You must be using Java and Eclipse to take this exam.

At the end of the exam, compress the project folder into a zip file and upload it to the LEA assignment for the final exam.

## Case Study:

### Question 1: (30 points)

Code correctly the following classes and methods:

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

1. Each object captain has an attribute name and also an attribute for the vessel object that the captain controls. The constructor of the Captain class must have a parameter (name) and must leave the vessels blank (null).
2. Each object vessel has an attribute name, an attribute type ("starbase" or "ship") and an attribute for the captain who commands it. The constructor of the class Vessel must have two parameters (type and name) and must leave the captain blank (null).
3. The class Starfleet has a static method **assign** to assign un captain to a vessel.
4. The class Starfleet has a list of all captains and a list of all active vessels.
5. The class Starfleet has a static method **remove**, overloaded, to remove a captain or a vessel from their respective list. If a captain is removed, the attribute "captain" of the vessel under his / her command must be updated to indicate "" (empty string). In a similar way, if a vessel is removed, the object that represents its captain must be updated.
6. The class Starfleet has a static method to save (serialize) the two lists in a file whose name is the argument of the method.
7. The class Starfleet has a static method to read (de-serialize) the two lists from a file whose name is the argument of the method.

Examples:

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

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

The vessel "Deep Space 9" is of type "base stellaire" 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 : (30 points)

Make a copy of the project you created to answer question 1.

Assume in question 1 that the captain's name is VARCHAR (50) and it is the captain's identifier. Also consider that the vessel name is VARCHAR (50) and it is the vessel identifier. Consider that the vessel type is VARCHAR (20). Standardize the column names: captain\_name, vessel\_name and vessel\_type.

1. (15 points) Define the tables to better represent the classes / data of the question 1. Create a sql script to create a StarFleet database, to create the tables you have defined and to insert data into those tables.

2. (15 points) Create in the Starfleet class methods to save the data in the tables and to read the tables and recreate the objects and the two lists.

Question 3 : (40 points)

Create a Java Swing GUI application to:

1. List all captains in the Starfleet database, that is, captain's name, vessel name and vessel type (if there is one assigned). Suggestion: use data table model.

2. Insert a captain.

3. Assign a captain to a vessel (which is already in the database)

4. Remove a captain.

Attention: SQL queries and commands must be protected from SQL injections.

Suggestion: use parametric queries

## Correction Grid

Question 1					
Elements of the competency: 00SU.5. Program the server-side application logic.					
Performance criteria	Highly satisfactory	Satisfactory	Unsatisfactory	Highly unsatisfactory	Total
5.3 Appropriate choice of clauses, operators, commands or parameters in database queries.	13-15	9-12	7-8	0-6	/30
5.4 Correct handling of database data.	13-15	9-12	7-8	0-6	
Question 2					
Elements of the competency: 00SU.3. Prepare the database.					
Performance criteria	Highly satisfactory	Satisfactory	Unsatisfactory	Highly unsatisfactory	Total
3.1 Suitable creation or adaptation of the database.	9-10	6-8	5	0-4	/30
3.2 Proper insertion of initial or test data.	9-10	6-8	5	0-4	
3.3 Compliance with the data model.	9-10	6-8	5	0-4	

Question 3					
Elements of the competency: 00SU.3. Prepare the database.					
Performance criteria	Highly satisfactory	Satisfactory	Unsatisfactory	Highly unsatisfactory	Total
3.2 Proper insertion of initial or test data.	9-10 .	6-8 .	5	0-4 .	/20
3.3 Compliance with the data model.	9-10	6-8 .	5	0-4 .	
Elements of the competency: 00SU.5. Program the server-side application logic.					
Performance criteria	Highly satisfactory	Satisfactory	Unsatisfactory	Highly unsatisfactory	Total
5.7 Precise application of secure programming techniques.	9-10	6-8	5	0-4	/10
Elements of the competency: 00SU.7. Control the quality of the application.					
Performance criteria	Highly satisfactory	Satisfactory	Unsatisfactory	Highly unsatisfactory	Total
7.2 Thorough reviews of code and security.	9-10	6-8	5	0-4	/10

CORRECTION GRID FOR LANGUAGE			
Clear Communication	Clear Communication, <b>most of the time</b>	Vague Communication	Unclear Communication
- 0	- 0,25	- 0,75	- 1
(Word Choice) Use of precise and rich vocabulary	(Word Choice) Use of precise vocabulary	(Word Choice) Use of imprecise vocabulary	(Word Choice) Use of inappropriate vocabulary
- 0	- 0,25	- 0,75	- 1
(Format/Type of work) Respect of norms	(Format/Type of work) Respect of <b>most of the</b> norms	(Format/Type of work) Non-respect of the norms	(Format/Type of work) Inappropriate in relation to the required norms
- 0	- 0,25	- 0,75	- 1
(Linguistic Code) (≤2 mistakes / page)	(Linguistic Code) (3-7 mistakes/page)	(Linguistic Code) (8-10 mistakes/ page)	(Linguistic Code) (>10 mistakes/ page)
- 0	- 0,25 - 1.25	- 1.25 - 1.75	- 2