School of Computer Science and Statistics, Trinity College Dublin

Module: CSU22041 Information Management, Academic Year 2022-2023- Gaye Stephens.

You will be assigned into groups for this assignment and each group will be assigned an application domain.

Part 1 Unified Modelling Language (UML)

1. Develop an Information Model design to support an IT system for your application domain. Present your design in a group report which includes the following.

    a. Background Research undertaken- Introduction to system, how you went about researching the domain and how you went about undertaking the task (including choice of tools to support group communication and drawing the diagrams)

    b. Description of Ethical Consideration for your system (using Ethics Canvas)

    c. Eight fully described UML Use Cases (ovals). Including for each UC/oval text descriptions for normal scenario and an error scenario

    d. A UML Class diagram comprising: at least 15 classes with each class having at least 2 data attributes (with types), Associations to be named and include role and cardinality information, No more than 2 subclass or aggregations, description of design decisions made.

    e. Two detailed UML Activity diagrams with descriptions for two selected use cases/ovals.

    f. Listing of who did what

    g. Discussion of Strengths and Weaknesses of the overall UML Design

2. A recorded **7-10 minute** presentation by the group on either Use Cases or Class Diagram or Activity Diagrams or Ethics Canvas) of your **interim** design, **including** strengths and weaknesses of the aspect of design. Each group can decide which diagram they would like to present. More details on how many students have to speak during the presentation and what you need to include will be provided during class.

Part 2 eXtensible Markup Language

1. XML and DTD documents

    a. From your group's UML Class diagram, pick <u>at least</u> 6 classes and for each create a different XML document. Include the following characteristics <u>for each</u> XML document:

        - At least 6 different XML elements/tags are used.
        - At least 1 of the XML elements should have 1 XML attribute
        - Interlinks between some of the documents (reflecting the assocations/relationships between the classes within the UML design), with enough information to allow for interesting cross document XML Queries to be designed

    b. For each XML document create a DTD

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2. Design and Document **at minimum 8** interesting **XQuery** queries that support some of your UML use cases. Pesent these queries during online sessions.
    - At least 3 of the queries should retrieve information from two or more interlinked XML documents, using the WHERE clause
    - At least 2 of the queries should use the FOR clause
    - At least 1 of the queries should use the LET clause
    - At least 2 of the queries should use a Built-in XQuery function
    - At least 2 of the queries should use User Defined Functions

3. Present your XML, DTD and XQueries in a group report which also includes the following.
    - What (if anything) did you need to change in going from UML design to XML implementation? - Include revised diagrams/ethics canvas, if appropriate.
    - List who did what in the group for XML implementation
    - Strengths and Weaknesses of the XML design and XQueries design
    - For the XML and DTD documents- Use comments to clearly state what is the purpose of the document, and comments describing purpose of each element and for each attribute, and why certain cardinality (*,+ etc.) is used.
    - For each Xquery include: identification of the UML use case that it supports, description of the purpose of the query and provide example outputs that you expect when query is executed.

Deadlines:

Submission	**Type**	**Deadline**	**Submit to**	**% of Marks**
UML Diagram Presentation	Group	Friday 14th October 2022	Blackboard	20%
UML Report	Group	Friday 21st October 2022	Blackboard	40%
XML Demonstrations	Group	Week beginning 21st November 2022	During lab sessions*	10%
XML Report	Group	Friday 2rd December 2022	Blackboard	30%

Each group will be assigned marks for their reports, presentation and demonstration. Each student who participates in the group will receive the same mark.

*This may be subject to change depending on size of class and labs provided.