Project Outline:

1. This is a group project of at least two members per group.
2. The project will begin with your group gathering requirements and developing a data warehouse design. Once the design is complete you will build a prototype data warehouse containing the necessary structures within your database and populating them with source data.
3. This will require you to develop the table definitions, extract/transformation/load (ETL) logic, and example report definitions
4. Each group will be required to submit a Requirements and Detailed Design document for their project.
5. This document is like a deliverable you would provide to a client before you began building a data warehouse system. It outlines the high-level aspects of the data warehouse, the goals it will serve, and covers key design considerations.
6. On the final day, your project group will give a presentation of your project to the class. Each group member is required to give a portion of the presentation and should be familiar with the subject matter right from the beginning.

- In your project, you are required to trace students' performance on several courses at the Belgium Campus University of Computing.
- For instance, on one of the courses the students can take two mid-term exams during one semester.
- At the end of the semester all scores, including those for mid-term, lecture attendance and weekly assessments, are summarized and anyone with the scores exceeding a pre-set limit can take final exam.
- The students with enough scores on the final exam pass the course.
- By interviewing end users, you will learn of their main needs and concerns.
- At this phase, it should be found out which questions they want to be answered and why it is not possible before the warehouse is designed.
- Defining end users' needs gives the information about the future data warehouse content.
- The goals of the warehouse should be clearly set, although they might change and be upgraded during design.
- End users must be contacted at later stages of data warehousing and they must be active in designing the warehouse.
- End users of your data warehouse may be the teaching staff and or any of the interested Belgium staff members.
- Their major task may be to answer such questions as:

1. Number of students having passed an exam by the specified date compared to their performance in course assessments and attendance of the lectures,
2. Percentage of students having passed the exam by taking the mid-term exams.
3. Percentage of students whose term assessment scores allow them take final exam.
4. The grades that students got compared to their success in term assessment and attendance of the lectures.
5. Comparison of the average grades on different written exams of the same course.
6. Correlation between success on exams and different high school types the students attended.
7. Correctness of the answers to the questions on the exams.
8. The questions with majority of correct answers and the questions most difficult to answer etc.

- Your Data warehouse should provide teaching staff with the required information, so that they can analyze their system of lecturing and designing the exams, and recognize and resolve potential problems.
- By analyzing the answers to different types of questions in the mid-term and final written exams, they can find out where the mistakes usually occur and what lessons require more detailed explanations.
- When the requirements of end users are collected, they are checked for their feasibility.
- Necessary data sources available to the organization in designing data warehouse should be identified.
- A detailed analysis of source databases must provide the information about available data and their quality.
- Creation of data warehouse is a process of finding out the balance between users' wishes and soundness of available data. As a source database, you may only need one transactional database of the courses and exams, so that you do not have many problems about consistent integration of data into data warehouse.
- With the completion of the mentioned tasks and acquired necessary knowledge, it is possible to start designing data warehouse.

- Find out which business processes you want to model and what the fact tables are.
- After recognizing the processes and fact tables, define the grain for each fact table.
- After defining the grain of each fact table, dimensions and facts of these fact tables become obvious.
- For every dimension define as many dimensional attributes as possible.

- When the logical model is designed and implemented in the database, it should be defined how data from the sources will be loaded into data warehouse.(A process known as extraction, transformation and loading process (ETL).
- During this process, data from sources are physically and logically transformed.
- The sources are mostly relational, transaction processing databases or flat files, but also older systems on some personal computers and external sources.
- It is your responsibility to define the procedures that ensure data consistency and integration, and to define how the data will be extracted from the sources, transformed and then loaded in data warehouse.
- Extraction, transformation and loading process may be managed by scripts in languages, such as SQL server course.
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Mark Allocation

Content	
Adherence to Steps followed in data warehouse design	10 marks
Gathering requirements	10 marks
Definition of users' requests	20 marks
Defining fact tables	15 marks
Defining Dimensional tables	15 marks
Defining extraction, transformation and loading process	10marks
Extraction, transformation and loading process scripts	10 marks
Initial load of data, into the data warehouse	10 marks
Total	**100 marks**

Additional Information

- This is a group project of at least two members per group.
- The assignment must be typed.
- A table of content and Bibliography must be included.
- There must be a Cover Page with you name, surname, and class on it.
- Belgium Campus consist of software that can **scan for plagiarism** and a student caught doing this will get 0 for this assignment.
- Late assignments will not be accepted; missing the deadline is an automatic 0.
- Although this is a group project, each member is supposed to submit his/her copy of the project; on Teams