



DATABASE SYSTEMS (AI/DS)

Spring, 2023 ASSIGNMENT # 1

Due Date: **Sun, March 12, 2023 (11:59 pm)**

Instructions

Please follow the following submission instructions. **Failure to submit according to the below format would result in a deduction of 10% marks. Submissions other than Google classroom (e.g., email, etc.) will not be accepted.**

1. You need to submit a word file with the ERD and assumptions for each of the questions and .sql file for your sql queries with proper comments.
2. Do not zip your file, submit each file individually, the naming convention should be like this (**i22_xxxx_AI_section.docx, i22_xxxx_AI_section.sql**),
3. Your diagram should be readable; it shouldn't be cluttered else you may lose marks.

Deadline: The deadline to submit the assignment is **Sunday, March 12, 2023 (11:59 pm)**. No late submission will be accepted. Correct and timely submission of the assignment is the responsibility of every student; hence no relaxation will be given to anyone.

Grading Policy

A rubric is on the last page, you may refer to it for the grading criteria

Honor Policy

This assignment is a learning opportunity that will be evaluated based on your ability. Plagiarism cases will be dealt with strictly. If found plagiarized, both the involved parties will be awarded zero marks in this assignment, all the remaining assignments, or even an **F grade** in the course.

TOOLS:

There are many tools to draw ERD diagrams such as Draw.io, lucid charts, etc. You may use any of them for this assignment

Note: Start early so that you can finish it on time.



Question 1

Marks [70]

ZARA is a Spanish clothing and accessories retailer based in Arteixo, Galicia. Founded on 24 May 1975 by Amancio Ortega and Rosalía Mera, the brand is renowned for its ability to deliver new clothes to stores quickly and in small batches. Zara needs just two weeks to develop a new product and get it to stores, compared to the six-month industry average and launches around 10,000 new designs each year. Zara was described by Louis Vuitton Fashion Director Daniel Piette as “possibly the most innovative and devastating retailer in the world. The company produces about 450 million items a year for its 1,770 stores in 86 countries. Zara has made of the use of Information Systems (IS) to advance in many areas. This has resulted in huge success for the company. This included the application of Business intelligence (BI) involves technologies, practices for collection, integration, and applications to analyze and present business information. The main aim of business intelligence is to promote better business decision-making. BI describes a group of information on concepts and methods to better decision-making in business. This is achieved by employing a fact-based support system. The intelligence systems are data-driven and sometimes used in executive information systems. Predictive views on business operations can be provided by the use of BI systems. predictive views on business operations can be provided by the use of BI systems since historical and current data has been gathered into a data bank performance management benchmarking is done whereby information on other companies in the same industry is gathered. Since Zara has a large network and therefore deals with large volumes of data, an enterprise information system has been employed in the firm. This is generally a type of computing system that involves an enterprise-class that is, typically offering total quality service handling large volumes of data, and is able to sustain a big organization. With this system, a technology platform is provided which enables the enterprise is provided to that information can be shared in all useful levels of management enterprise systems are important in removing the problem of fragmentation of information. This happens when there are numerous information systems in an enterprise. The problem is solved by developing a standard data structure. Zara is a big organization; the enterprise systems are housed in many different data centers and include a content management system as the main application. The Zara team comprises technology professionals. These include content specialists, network and system engineers, flash developers, database business analysts and administrators, software developers, quality assurance managers, and computer and applications support technicians. All these specialists



work in tandem to bring about a competitive advantage to businesses by allowing for quick-response capability. The Zara is devoted to integrating information technology appropriately into all areas of its operations and activities. The range of services and resources available to its clients is attributed to the commitment to integrating IT properly into the organization. The client services group in the Zara partners with staff and clients to identify and meet each group's technological requirements. This group of technical advisors associates with departments to execute a roadmap for a team's technological vision and then defines this vision within entity projects. Much support is required for invariable innovation. The Zara IT group is devoted to developing the community through technology and operates closely with business associates. The IT group is devoted to developing the community through technology and operates closely with business associates. The IT group has the technical support and tools they require to come up with new ideas and spread the ideas to the wider community worldwide. This ensures that client needs are realized. A constantly growing state-of-the-art technology infrastructure has enabled the firm to develop and maintain a fully integrated organization/ enterprise. The infrastructure has enabled the firm to develop and maintain a fully integrated organization/ enterprise. The infrastructure entails a core of systems and attempts designed to produce the flexibility and capacity for innovation and growth. Zara thrives in an environment of change, experimentation, and learning that is spreading over the boundaries for the application of IT in their business in the enterprises' easy-to-use modular tools, templates, and platforms that involve all sides of life at the Zara firms including career development, administration, and operations are implemented and developed. In Zara other web-based solutions are deployed with advanced knowledge management thereby making a big shift in the quality and speed of work in how the enterprises function. In the exploding growth of the software market, a new world growth for the software market a new world of connectivity is realized in Zara. The urgency of the business recognizing the importance of corporate portals has enabled the linkage of information, data, people, and knowledge to provide business solutions. The corporate portals come from consumer portals like Alta-vista, yahoo! and Lycos. The portals (gateways) show the importance of letting clients have a wide scope of varied information on the web. This has given rise to the increase in multitasking, receiving information, and checking from varied sources and thereby getting involved in projects that cross geographical boundaries with this technology the needs of the community, employees, and even the extended network that is more advanced are served. Zara is possibly the most devastating and innovative retailer in the



world. With more than 1000 shops worldwide, Zara has turned controlled garment factories into a competitive advantage by making and designing garments. By making the garments themselves, it can quickly react to varying market trends. Zara has been able to succeed in building a massive brand, without promotion or advertising but through information systems and information technology.

Problem Statement

You are required to design an Entity-Relationship Diagram (ERD) for the ZARA brand. The ERD should cover all the entities involved in the supply chain and manufacturing side of ZARA, as well as those involved in the retail side of ZARA. ZARA is a multinational company with manufacturing outlets around the world, so they have many vendors for the manufacturing side. Additionally, they have several types of employees, including contract workers, manufacturing staff, and business personnel such as marketing, retail, and finance. Employees are also located around the world.

Regarding customers, there are two types: those who purchase online and those who buy from physical stores located worldwide. When a person purchases something in-store, they must provide their personal information to the system for record-keeping purposes. If a person buys something online, ZARA provides the delivery service to the customer.

Keeping the above scenario in mind, create an ERD diagram that clearly shows all entities, their attributes, relationships, and cardinalities. Be as creative as possible, as your level of creativity and attention to detail can result in higher marks.



Question 2

Marks [80]

Design a conceptual database design for a video streaming platform similar to YouTube. In the platform, you have multiple actors for example content creators, viewers, AD agencies, and the admin of the platform. The platform generates its revenue from the Ads placed inside the videos, these ads are of different categories i.e., video ads, image ads, short pause ads, etc., and each of these ads has different pricing per video per view, moreover, the price of ads is different for every location. To place an Ad, ad agencies can create an account on the platform and subscribe to the Ads on the videos. There are other actors on the platform such as content creators, who can create a free account on the platform and post their videos. Content creators can also view the content of other content creators, they can subscribe to their channel, and react to individual videos by liking or disliking, or even by comments. Content creators can enable ads on their videos, and they are paid based on the number of views on the particular video.

You need to create an ERD diagram for the above scenario. You should clearly mention all the entities and their attributes, and their relation with entities. You should also clearly mention the cardinality between the relations as well. For this question, you need to be as creative as you can, and you should try to handle as many scenarios as you can, do imagine how a real-world video streaming platform would work

Afterward, answer the following questions using SQL queries:

1. Show all the subscribed channels of a content creator “John” who has a high average sentiment on their videos (Hint: Try to handle in the ERD, by using the sentiment of the comments)
2. Show all the earnings of all the content creators in the past 2 months
3. Show the highest-used category of ads used by the content creators

RUBRICS:

Criteria	Questions 1	Question 2
Identification of entities	20	15
Identification of relations	20	15
Creativity	15	15
Diagram Quality	05	05
Cardinalities	10	10
Query 1	-	10
Query 2	-	05
Query 3	-	05