



University of Johannesburg
Academy of Computer Science & Software Engineering
IFM2A10: Informatics 2A – Database Design
Practical Assignment 6 (Due: 5 April 2016 @ 12h30pm)

Assignment

“Computer, compute to the last digit the value π ” – Spock

In an alternate universe, hundreds of years ahead, the Milky Way galaxy is home to a group of ally alien species that formed the United Federation of Planets. They have dedicated themselves to creating a stable and hopefully conflict-free environment, as well as explore the furthest depths of space in the interest of science.

They have just recently discovered a series of wormholes that allows them to visit unexplored galaxies. With this new discovery, they requested the newly instated Admiral James Kirk to control the Federation's expeditions as well as build an information system that will support him into doing so. After a meeting with his trusted officers, the following was established as requirements for the information system's database:

- Commander Spock (Science Officer) explained that there needs to be a way to keep track of which galaxies are visited and which planets are explored at each galaxy. Commander Spock further explained that, because different types of planets might be found, there also needs to be a way to keep track of the different types of planets.
- Commander Montgomery Scott (Chief Engineer) explained that there needs to be a way to keep track of which ships are sent to explore the different galaxies that have been discovered. Each galaxy is explored by many of the fleet's different ships, although each ship under the command of Commander Scott can only be assigned to explore a single galaxy.
- Dr. Leonard McCoy (Chief Medical Officer) explained that in order to better monitor the crew members of the federation, there needs to be a way of checking which crew members are assigned to the federation's ships.
- Nyota Uhura (Chief Communication Officer) explained that the system needs to also keep track of information on the different alien species that are discovered in the planets that are explored. She has pointed out that each alien species may be found in the different planets that are explored, and that at each of the planets where they are found each of the alien species usually elect a community leader (whose name must be recorded).

Admiral Kirk has chosen YOU! YES YOU! BELIEVE IT! YOU ARE THE CHOSEN ONE! He has selected you to be the Chief Database Design Officer to the Federation. Your first task is to design the database they need for their information system. After your first meeting Admiral Kirk and all the chief officers, you identified that the database will need to keep track of information on Galaxies, Planets, Planet Types, Alien Species, Ships and Crew Members. The attributes that will be included in the database design must be decided by you. Admiral Kirk trusts that you will be able to select appropriate attributes (at least 3) for each of the tables which must be in your database.

Questions

1. Illustrate a **conceptual design** of the database by means of an ER diagram.
 - a. You may use any tool to draw the ER diagram. No hand drawn diagrams will be accepted.
2. Implement the designed database using **Microsoft Access**.
 - a. Implement all tables
 - b. Save all SQL statements
3. Enter data to show your database is appropriately designed. You may enter the data directly into Microsoft Access (**Meaning, no need to write and save INSERT INTO queries**)
 - a. At least 2 galaxies, 2 planets per galaxy, 3 possible planet types, 5 alien species, 3 ships, 2 crew members per ship.
4. Implement a Query that will enable a view of each crew member as well as the galaxy that they have been sent to explore. (**Make use of SQL JOINS**).
5. Implement a Query that will enable a view of each Alien Species as well as the Planet Type that they have been discovered on. (**Make use of SQL JOINS**).

You must upload all designs and illustrations, along with your database, to EVE. Digital illustrations must be either in PDF or image format. Paper submissions will NOT be accepted.

Instructions

- This solution must be implemented in Microsoft Access.
- Name all queries according to their question number. For example:
 - Question A as “**A**”
 - Question B1 as “**B1**”
 - etc.
- Submission details are outlined in the General Undergraduate Learning Guide. Please ensure that the submission complies with the instructions therein.
- Submit and upload a text file (extension: .txt) that adheres to the following rules:
 - Name your text file using your Student Number, Initials, Surname and Practical number.
 - E.g. 2014000001_A_SOMEONE_P04.txt
 - Include in your text file all your student details (Student Number, Initials, Surname and Practical number.)
 - Copy all your queries to the text file.
 - Use the Question Number as a heading for each query or set of queries.

Mark Allocation

Question 1 – ER Diagram	0 – 3	4 – 6	7 – 10
Entities formed with attributes	<ul style="list-style-type: none"> Wrong or no appropriate entities added Some correct attributes assigned to entities 	<ul style="list-style-type: none"> Most entities defined Most necessary attributes assigned to new entity 	<ul style="list-style-type: none"> All entities defined All necessary attributes assigned and keys assigned
Entity relationships	No or some relationships shown	Most relationships shown with correct attributes	Most relationships shown with correct attributes and correct multiplicity
Question 2 – MS Access Implementation	0 – 3	4 – 6	7 – 10
Entities and relationships implemented	No connection between implementation and conceptual design	Entities and relationships implemented correctly according to conceptual design	All entities and relationships implemented correctly
Question 3 – Minimum Data Requirements	0 – 2	3 – 9	10
Data in MS Access Database	Few, but close to no data	Some data entered, but not all data requested	Minimum data requirements fully met
Question 4 – MS Access Implementation	0 – 1	2 – 3	4 – 5
Display each Crew Member as well as the Galaxy that they have been sent to explore	No or invalid query implemented	Incomplete or partially valid query implemented implemented without SQL Joins	Valid query implemented with SQL Joins.
Question 5 – MS Access Implementation	0 – 1	2 – 3	4 – 5
Display each Alien Species as well as the Planet Type that they have been discovered on	No or invalid query implemented	Incomplete or partially valid query implemented implemented without SQL Joins	Valid query implemented with SQL Joins.

Total: 50 Marks

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