CSE 414 Databases – Spring 2022

Assignment 1

Deadline (29.05.2022 Sunday, 23:55)

This assignment is not a group assignment. You must solve them by yourself. You must solve the questions on a paper, not a word document. Take the photo of the paper and upload it.

A Park consists of a collection of Wood-Sections each has a number of specific species of trees. You can access everywhere by Roads. The forest also has a Manager. There are Fire-Stations in the park. Each one monitors fires in the Park. There are Facilities which consists of camps and offices in the park. There are also Rivers. Each river supply water to a different facility.

Answer the questions using the text above.

1- **(35 points)** Draw the E-R diagram of the park.

2- **(5 points)** Give all the functional dependencies in the question.

3- **(10 points)** Is there a weak entity in the E-R diagram. If there isn't, modify the question so that there will be a weak entity. Explain every detail. Explain why you need a weak entity in both cases.

4- **(15 points)** Create tables for your E-R diagram.
(Do not forget that you should consider the effect of type of relationships to the tables.)

5- **(20 points)** Give 2 relations. Show if they hold or does not the criteria of 3NF and Boyce-Codd Normal Form. Explain why they are (or not) in 3NF and Boyce-Codd Normal Form, give your reasons and proofs in details.

6- **(15 points)** Create database schema where the relations must hold Boyce-Codd Normal Form or 3NF after the normalization steps.