Fundamentals of Database Systems – ASSIGNMENT 2

PGDBA, First Year, 2020–2022

Deadline: January 15, 2021

Total: 5 marks

SUBMISSION INSTRUCTIONS

1. Submit all the solutions in a single file.
2. Naming convention for your submission file (assuming 20BM6JPxx is your roll number): `20BM6JPxx-assign2` (.rtf, .docx, .doc, .pdf, .tex, etc.).
3. To submit a solution file (say `20BM6JPxx-assign1.pdf`), ensure that it is not password protected and mail to `<assignisik@gmail.com>` with the subject line as follows: `PGDBA 2020-22 20BM6JPxx Assignment 2`.

NOTE: All the solutions must be self-sufficient and to the point.

Q1. Consider the following schema representing the year of establishment of different branches of multiple banks:

- BRANCH = $\langle id : integer, ifsc : string, yoe : string \rangle$

Given the IFSC codes are going to change soon, suppose we need to retrieve bank-specific details for the revision of IFSC codes. Let the first three characters of IFSC code symbolize the bank name (in abbreviation). You need to write an SQL query that can find out the first three characters of each IFSC code.

Q2. Consider the following schema representing the details about the winners of Rio 2016 Olympic:

- OLYMPIAN = $\langle game : string, name : string, dob : date \rangle$

Write an SQL query that can find out the numbers of Olympians whose DOB is between 01/01/1951 to 05/08/1976 and are grouped according to game.

Q3. Given the relational schema $R = (H, I, J, D, P, Q, A)$ with atomic attributes, for which the set of functional dependencies $\{H \rightarrow HIJDPQA, ID \rightarrow P, JP \rightarrow H, J \rightarrow I\}$ hold, answer the following questions:

(i) Find the candidate keys for R.

(ii) Identify the highest normal form that R satisfies.

(iii) If R is not in BCNF, decompose it until it becomes. During decomposition, re-compute the keys and normal forms the emerging relations satisfy.