**COMP 3005**  
**Assignment #3**  
**Due: Oct. 19 @11:59PM**

**Instruction**

1. Do the assignments independently. Copying is not allowed.
2. The database for this assignment is the same as in Assignment #1. Do the assignment directly on this document and rename it with your last name + first name and submit to **brightspace**. Make sure your uploaded file can be opened.
3. You can use any version of Oracle VM or download and install latest version of Oracle from its official website.

**Part 1 Concepts (20 marks)**

Explain the following concepts based on the definitions given in the lecture notes. Different answers found online will be marked wrong.

1. Type compatibility (2)
2. Relationally complete (2)
3. Basic relational operators (2)
4. Free variable (2)
5. Bound variable (2)
6. Grouping (2)
7. Aggregate functions (2)
8. Use relational algebra to represent R1(S#, C#) divideby R2 (S#) (6)

**Part 2 (80 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Employees** | | | |
| **E#** | **Name** | **Age** | **Manager** |
| E1 | Adams | 50 |  |
| E2 | Blake | 40 | E1 |
| E3 | Clark | 35 | E1 |
| E4 | David | 30 | E3 |
| E5 | Emily | 25 | E4 |
| E6 | Last | 20 | E5 |

|  |  |  |
| --- | --- | --- |
| **Workon** | | |
| **E#** | **P#** | **Hours** |
| E1 | P1 | 700 |
| E2 | P1 | 300 |
| E2 | P2 | 200 |
| E3 | P1 | 100 |
| E3 | P2 | 200 |
| E3 | P3 | 300 |
| E4 | P1 | 100 |
| E4 | P2 | 200 |
| E4 | P3 | 300 |
| E6 | P1 | 200 |
| E6 | P2 | 300 |
| E6 | P3 | 400 |
| E6 | P4 | 500 |

|  |  |  |
| --- | --- | --- |
| **Projects** | | |
| **P#** | **Name** | **Location** |
| P1 | CPU | B1 |
| P2 | GPU | B2 |
| P3 | GPU | B2 |
| P4 | SSD | B3 |

Given the employees and projects databases the same as in Assignment #1. Use Query By Example (QBE) to express queries 1,2,3,4,5,6 and use SQL to express all 10 queries. (80)  
Each QBE query is 5 marks. Each SQL query is 4 marks and the result is 1 mark. Screenshot of both SQL query and running results are needed in order to get the 5 marks.

1. Get the age of Last.
2. Get the name of Last’s manager
3. Get the name of the employee who works on GPU project.
4. Get the name of the employee who does not work on any project.
5. Get the pair of employee name and project name such that the employee works on the project less than 300 hours.
6. Get the name of the employee who works on every project
7. Get the name of the employee who works on every project except SSD.
8. Get the name of the employee who works on every project that Clark works on.
9. Get the name of the employee who works on the same projects that Clark works on.
10. Get the name of the employee who works on more than two projects.