**Task:1**

Consider a schema-example:

**R**=*(a,b,c)*

With function dependencies:

*b* -> *c*

*a, c* -> *b*

**R** is not in BCNF

*b* is not a superkey.

Any decomposition of **R** will not include all the

attributes in

*a, c -> b*

Thus, the composition is NOT dependency-preserving

**Task:2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| UnitID | TutorID | Date | Room | Topic |
| U1 | Tut1 | 23.02.03 | 629 | GMT |
| U2 | Tut3 | 18.11.02 | 631 | Gln |
| U4 | Tut5 | 04.07.03 | 621 | AVQ |
| U5 | Tut3 | 05.05.03 | 632 | PhF |

|  |  |  |
| --- | --- | --- |
| UnitID | StudentID | Grade |
| U1 | St1 | 4.7 |
| U1 | St4 | 4.3 |
| U2 | St1 | 5.1 |
| U4 | St2 | 5.0 |
| U5 | St2 | 4.9 |

|  |  |
| --- | --- |
| Topic | Book |
| GMT | Deumlich |
| Gln | Zehnder |
| AVQ | SwissTopo |
| PhF | Dummlers |

|  |  |
| --- | --- |
| TutorID | TutEmail |
| Tut1 | [tut1@fhbb.ch](mailto:tut1@fhbb.ch) |
| Tut3 | [tut3@fhbb.ch](mailto:tut3@fhbb.ch) |
| Tut5 | [tut5@fhbb.ch](mailto:tut5@fhbb.ch) |

**Task:3**

|  |  |  |  |
| --- | --- | --- | --- |
| ProjectName | Budget | TeamSize | ProjectManager |
| Project1 | 1 kk $ | 15 | Manager1 |
| Project2 | 1.5 kk $ | 12 | Manager2 |

|  |  |
| --- | --- |
| ProjectManager | Position |
| Manager1 | CTO |
| Manager2 | CTO2 |

**Task:4**

|  |  |
| --- | --- |
| Group | Speciality |
| g1 | s1 |
| g2 | s2 |

|  |  |
| --- | --- |
| Speciality | Faculty |
| s1 | f1 |
| s2 | f2 |

**Task:5**

|  |  |  |
| --- | --- | --- |
| ProjectID | Curator | TeamSize |
| p1 | e1 | 100 |
| p2 | e2 | 120 |

|  |  |
| --- | --- |
| ProjectGroupsNumber | TeamSize |
| 5 | 100 |
| 6 | 120 |

|  |  |
| --- | --- |
| Department | Curator |
| d1 | e1 |
| d2 | e2 |

**Task:6**

**The three design goals for relational databases:**

*BCNF*

*Losslessness*

*Dependency preservation*

**Desirable:**

*Lossless join*

**Undesirable:**

*Lossy decomposition*