**ER Mapping**

**Step1: Mapping of regular entity types**

student

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| stu\_id | fname | lname | email | status |

degree

|  |  |
| --- | --- |
| degreeID | degree |

file\_type

|  |  |
| --- | --- |
| fileID | file\_type |

category

|  |  |
| --- | --- |
| categoryID | categoryName |

supervisor

|  |  |
| --- | --- |
| supervisorID | name |

project

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| projectID | project\_name | description | view | expire\_after | year | file\_path |

**Step2: Mapping of weak entity types**

**-------------------------------------------------------**

**Step3: Mapping of binary 1:1 relationship types**

project\_student

|  |  |
| --- | --- |
| projectID | stu\_id |

**Step4: Mapping of binary 1:N relationship types**

Project

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| projectID | Project\_name | | year | view | expire\_after | description | stu\_id | supervisorID | categoryID | FileID |
| file\_path | degreeID |

**Step5: Mapping of binary M:N relationship types**

Project\_supervisor

|  |  |
| --- | --- |
| projectID | supervisorID |

**Step6: Mapping of multivalued attributes**

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**Step7: Mapping of N-ary relationships types**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| projectID | Project\_name | | year | view | expire\_after | description | stu\_id | supervisorID | categoryID | FileID |
| file\_path | degreeID |

**Data normalization**

1NF ค่าข้อมูลในแต่ละattribute มีค่าเป็นatomic valuesแล้ว

2NF จัดการข้อมูลที่เป็น Partial Dependency ซึ่งหมายถึงทุก column ในตารางควรขึ้นกับ primary key ทั้งหมด

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| projectID | project\_name | year | view | expire\_after | File\_path | description |

project\_degree

|  |  |
| --- | --- |
| projectID | degreeID |

Project\_filetype

|  |  |
| --- | --- |
| projectID | fileID |

Project\_category

|  |  |
| --- | --- |
| projectID | categoryID |

3NF ไม่มี transitive dependency เพราะแต่ละตารางอ้างอิงกับ primary key ของตัวเองโดยตรง