

**AMERICAN INTERNATIONAL UNIVERSITY- BANGLADESH**

**(AIUB)**

**FACULTY OF SCIENCE AND TECHNOLOGY**

**DEPARTMENT OF SCIENCE**

INTRODUCTION TO DATABASE

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**Section: B**

**Case Study and E-R Diagram of Project**

**Supervised By**

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**Topic: School Management**

**Case study:**

In the school management system of ‘A’ Kinder Garden Public school, students of different classes are there. One student can enroll in one class only and a class may have many students. The management database has information of students like unique student’s ID (primary key), phone number, Student’s name, Guardian’s name, Student’s address, Student’s attending class. Students can register to courses. Courses have their own information like unique course ID, course name, course sections. One student may register in many courses and one course might be registered by many students. Courses are linked to classes as there are 1 to 10 different classes. Classes have their own information too like unique class ID, class name. Every class and course have different class and different course ID. One course is for one unique class. A class has more than one course. These courses are taken by teachers. Teachers have information stored like unique teacher Id (primary key), teacher name, teacher address, salary. One teacher is responsible for more than one classes. One class has more than one teachers for having multiple courses. Teachers are responsible for different classes. Each department is associated with teachers of different classes. One department has many teachers but a teacher in in single department. Departments also have information like unique department ID, department name, courses taken. So, courses are connected to departments too. Each class has their own classrooms. Classrooms have info like classroom ID which is unique. One class has multiple classrooms because of sections. Infrastructure category has classrooms entered in their model. Infrastructure has things like infrastructure ID, infrastructure name. Again, infrastructure is maintained by the staff. Staffs have their own information like Id, name, phone, address, salary. Many staffs are there to take care of infrastructure. Staffs also make reports on programs happening in school. Each report has different report ID, report name, happening date. Teachers are there joined in the school committee board. A committee board has many teachers attending. A committee board has its unique member id, member name, member status. School committee board take various projects about research and educational purposes. Projects have their own ID, name, primary date, finalized date. Every unique ID in all entities are primary key.

**Normalization:**

**Enroll** (sid, sname, saddress, phone, guardian’s\_name, attending\_class, cid, classname)

1NF: Phone multivalued attribute

2NF: sid, sname, saddress, phone, guardian’s\_name, attending\_class, cid

cid, classname

3NF: No transitive dependency

sid, sname, saddress, phone, guardian’s\_name, attending\_class, cid

cid, classname

Table: sid, sname, saddress, phone, guardian;’s\_name, attending\_class, cid

cid, classname

**Register** (sid, sname, saddress, phone, guardian’s\_name, attending\_class, courseid, coursename, section)

1NF: Phone multivalued attribute

2NF: sid, sname, saddress, phone, guardian’s\_name, attending\_class

courseid, coursename, section

csid, sid, courseid

3NF: No transitive dependency

sid, sname, saddress, phone, guardian’s\_name, attending\_class

courseid, coursename, section

csid, sid, courseid

Table: sid, sname, saddress, phone, guardian’s\_name, attending\_class

courseid, coursename, section

csid, sid, courseid

**In** (courseid, coursename, section, did, dname, taken\_course)

1NF: No multivalued attributes

2NF: courseid, coursename, section, did

did, dname, taken\_course

3NF: No transitive dependency

courseid, coursename, section, did

did, dname, taken\_course

Table: courseid, coursename, section, did

did, dname, taken\_course

**Linked** (courseid, coursename, section, cid, classname)

1NF: No multivalued attributes

2NF: courseid, coursename, section, cid

cid, classname

3NF: No transitive dependency

courseid, coursename, section, cid

cid, classname

Table: courseid, coursename, section, cid

cid, classname

**Taken** (courseid, coursename, section, tid, tname, taddress, salary, phone)

1NF: Phone multivalued attribute

2NF: courseid, coursename, section

tid, tname, taddress, salary, phone

ctid, courseid, tid

3NF: No transitive dependency

courseid, coursename, section

tid, tname, taddress, salary, phone

ctid, courseid, tid

Table: courseid, coursename, section

tid, tname, taddress, salary, phone

ctid, courseid, tid

**Associated** (tid, tname, taddress, salary, phone, did, dname, taken\_course)

1NF: Phone multivalued attribute

2NF: tid, tname, taddress, salary, phone, did

did, dname, taken\_course

3NF: No transitive dependency

tid, tname, taddress, salary, phone, did

did, dname, taken\_course

Table: tid, tname, taddress, salary, phone, did

did, dname, taken\_course

**Responsible In** (tid, tname, taddress, salary, phone, cid, classname)

1NF: Phone multivalued attribute

2NF: tid, tname, taddress, salary, phone

cid, classname

tcid, tid, cid

3NF: No transitive dependency

tid, tname, taddress, salary, phone

cid, classname

tcid, tid, cid

Table: tid, tname, taddress, salary, phone

cid, classname

tcid, tid, cid

**Join** (tid, tname, taddress, salary, phone, memberid, mname, mstatus)

1NF: Phone multivalued attribute

2NF: tid, tname, taddress, salary, phone, memberid

memberid, mname, mstatus

3NF: No transitive dependency

tid, tname, taddress, salary, phone, memberid

memberid, mname, mstatus

Table: tid, tname, taddress, salary, phone, memberid

memberid, mname, mstatus

**Has** (cid, classname, classid)

1NF: No multivalued attributes

2NF: cid, classname

classid, cid

3NF: No transitive dependency

cid, classname

classid, cid

Table: cid, classname

classid, cid

**Entered In** (inid, in\_name, classid)

1NF: No multivalued attributes

2NF: inid, in\_name

classid, inid

3NF: No transitive dependency

inid, in\_name

classid, inid

Table: inid, in\_name

classid, inid

**Take In** (memberid, mname, mstatus, pid, pname, primary\_date, finalized\_date)

1NF: No multivalued attributes

2NF: memberid, mname, mstatus,

pid, pname, primary\_date, finalized\_date, memberid

3NF: No transitive dependency

memberid, mname, mstatus,

pid, pname, primary\_date, finalized\_date, memberid

Table: memberid, mname, mstatus,

pid, pname, primary\_date, finalized\_date, memberid

**Maintain** (inid, in\_name, stid, stname, staddress, phone, salary)

1NF: Phone multivalued attribute

2NF: inid, in\_name

stid, stname, staddress, phone, salary

instid, inid, stid

3NF: No transitive dependency

inid, in\_name

stid, stname, staddress, phone, salary

instid, inid, stid

Table: inid, in\_name

stid, stname, staddress, phone, salary

instid, inid, stid

**Make** (stid, stname, staddress, phone, salary, rid, sname, happening\_date)

1NF: Phone multivalued attribute

2NF: stid, stname, staddress, phone, salary

rid, sname, happening\_date

rstid, stid, rid

3NF: No transitive dependency

stid, stname, staddress, phone, salary

rid, sname, happening\_date

rstid, stid, rid

Table: stid, stname, staddress, phone, salary

rid, sname, happening\_date

rstid, stid, rid

**Total Table:**

sid, sname, saddress, phone, guardian’s\_name, attending\_class, cid

cid, classname

sid, sname, saddress, phone, guardian’s\_name, attending\_class

courseid, coursename, section

csid, sid, courseid

courseid, coursename, section, did

did, dname, taken\_course

courseid, coursename, section, cid

cid, classname

courseid, coursename, section

tid, tname, taddress, salary, phone

ctid, courseid, tid

tid, tname, taddress, salary, phone, did

did, dname, taken\_course

tid, tname, taddress, salary, phone

cid, classname

tcid, tid, cid

tid, tname, taddress, salary, phone, memberid

memberid, mname, mstatus

cid, classname

classid, cid

inid, in\_name

classid, inid

memberid, mname, mstatus

pid, pname, primary\_date, finalized\_date, memberid

inid, in\_name

stid, stname, staddress, phone, salary

instid, inid, stid

stid, stname, staddress, phone, salary

rid, sname, happening\_date

rstid, stid, rid

**Final Table:**

1. **Students** (sid, sname, saddress, phone, guardian’s\_name, attending\_class, cid)
2. **Class** (cid, classname)
3. **Courses&Students** (csid, sid, courseid)
4. **Courses1** (courseid, coursename, section, did)
5. **Courses2** (courseid, coursename, section, cid)
6. **Courses&Teachers** (ctid, courseid, tid)
7. **Teachers1** (tid, tname, taddress, salary, phone, did)
8. **Departments** (did, dname, taken\_course)
9. **Teachers&Class** (tcid, tid, cid)
10. **Teachers2** (tid, tname, taddress, salary, phone, memberid)
11. **Classrooms1** (classid, cid)
12. **Infrastructures** (inid, in\_name)
13. **Classrooms2** (classid, inid)
14. **Committee** (memberid, mname, mstatus)
15. **Projects** (pid, pname, primary\_date, finalized\_date, memberid)
16. **Infrastructures&Staffs** (instid, inid, stid)
17. **Staffs** (stid, stname, staddress, phone, salary)
18. **Reports** (rid, sname, happening\_date)
19. **Reports&Staffs** (rstid, stid, rid)