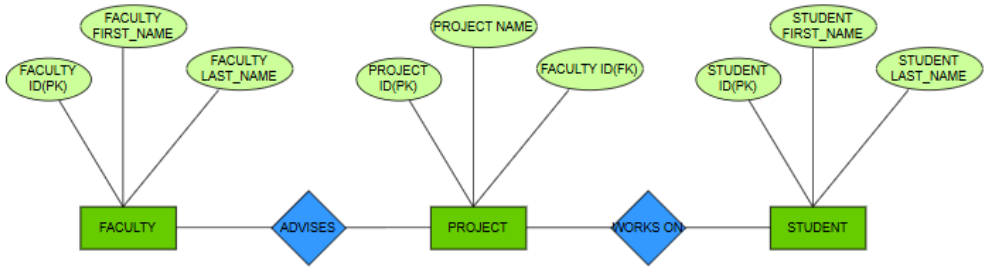
E/R Diagram



RELATIONSHIPS:

FACULTY ⟶ PROJECT (1:M) A FACULTY MEMBER CAN ADVISE MANY PROJECT.

STUDENT ⟶ PROJECT (M:M) ONE STUDENT CAN WORK ON MULTIPLE PROJECTS, AND A PROJECT CAN HAVE MULTIPLE STUDENTS.

(1NF) – Eliminating Repeating Groups

Each Project should have a unique Project ID.

Ensure each column contains atomic values.

Each row should have a single atomic value per column.

FACULTY ID	FACULTY FIRST NAME	FACULTY LAST NAME	PROJECT ID	PROJECT NAME	STUDENT FIRST NAME	STUDENT LAST NAME	STUDENT ID
111111	JACK	CRAIGS	P001	LARGE LANGUAGE MODEL FOR WEB DEVELOPMENT	DANIEL	JOHNSON	101010
111111	JACK	CRAIGS	P002	LARGE LANGUAGE MODEL FOR HEALTHCARE	EMMA	BROWN	121212
222222	NATHAN	SMITH	P003	DATABASE DEVELOPMENT FOR SCHOOL REGISTRATION	HEATHER	WILLIAMS	313131
222222	NATHAN	SMITH	P004	DATA MART FOR STUDENT PERFORMANCE ANALYSIS	EMMA	BROWN	121212
333333	MIKE	JONES	P005	DEVELOPING WEBSITE FOR TUTORING APPOINTMENTS	GEORGE	BROWN	131415
333333	MIKE	JONES	P006	DEVELOPING WEBSITE FOR SCHOOL NEWS	GEORGE	BROWN	131415
333333	MIKE	JONES	P007	AUTOMATING GRADING TOOLS FOR D2L	DANIEL	JOHNSON	101010

(2NF) – Removing Partial Dependencies

Remove partial dependencies by ensuring all non-key attributes depend on the entire primary key.

Ensure each table have relevant attributes.

This table do not have partial dependencies.

FACULTY ID	FACULTY FIRST NAME	FACULTY LAST NAME
111111	JACK	CRAIGS
222222	NATHAN	SMITH
333333	MIKE	JONES

STUDENT ID	STUDENT FIRST NAME	STUDENT LAST NAME
101010	DANIEL	JOHNSON
121212	EMMA	BROWN
313131	HEATHER	WILLIAMS
131415	GEORGE	BROWN

PROJECT ID	PROJECT NAME	FACULTY ID
P001	LARGE LANGUAGE MODEL FOR WEB DEVELOPMENT	111111
P002	LARGE LANGUAGE MODEL FOR HEALTHCARE	111111
P003	DATABASE DEVELOPMENT FOR SCHOOL REGISTRATION	222222
P004	DATA MART FOR STUDENT PERFORMANCE ANALYSIS	222222
P005	DEVELOPING WEBSITE FOR TUTORING APPOINTMENTS	333333
P006	AUTOMATING GRADING TOOLS FOR D2L	333333
P007	DEVELOPING WEBSITE FOR SCHOOL NEWS	333333

STUDENT ID	PROJECT ID
101010	P001
121212	P002
313131	P003
121212	P004
131415	P005
131415	P006
101010	P007

To achieve (3NF), we need to ensure that there are no transitive dependencies.

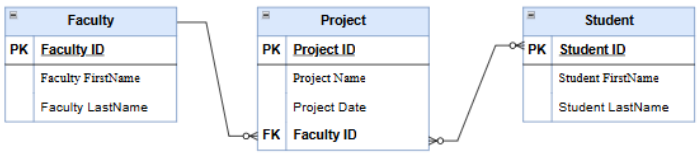
FACULTY ID	FACULTY FIRST NAME	FACULTY LAST NAME
111111	JACK	CRAIGS
222222	NATHAN	SMITH
333333	MIKE	JONES

STUDENT ID	STUDENT FIRST NAME	STUDENT LAST NAME
101010	DANIEL	JOHNSON
121212	EMMA	BROWN
313131	HEATHER	WILLIAMS
131415	GEORGE	BROWN

PROJECT ID	PROJECT NAME	FACULTY ID
P001	LARGE LANGUAGE MODEL FOR WEB DEVELOPMENT	111111
P002	LARGE LANGUAGE MODEL FOR HEALTHCARE	111111
P003	DATABASE DEVELOPMENT FOR SCHOOL REGISTRATION	222222
P004	DATA MART FOR STUDENT PERFORMANCE ANALYSIS	222222
P005	DEVELOPING WEBSITE FOR TUTORING APPOINTMENTS	333333
P006	AUTOMATING GRADING TOOLS FOR D2L	333333
P007	DEVELOPING WEBSITE FOR SCHOOL NEWS	333333

STUDENT ID	PROJECT ID
101010	P001
121212	P002
313131	P003
121212	P004
131415	P005
131415	P006
101010	P007

Relational Database Model



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