Department

Graduate

Project

Professor

M

1

principal\_investigator

M

research\_assistant

1

M

M

M

co\_Investigator

M

1

work

chairman

M

M

1

M

1

degree\_major

advisor

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Professor | | | | | | |
| ssn | name | age | gender | rank | specialty | deptNum |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Project | | | | | | |
| projNum | sponsor | start\_date | end\_date | budget | grad\_ssn | prof\_ssn |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Graduate | | | | | |  |
| snn | name | age | gender | degree\_program | advsr\_ssn | deptNum |

|  |  |
| --- | --- |
| Research\_Assistant | |
| ssn | projNum |

|  |  |
| --- | --- |
| Co\_investigator | |
| ssn | projNum |

|  |  |  |  |
| --- | --- | --- | --- |
| Department | | |  |
| deptNum | name | main\_office | chairman |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Professor | | | | | | |
| ssn | name | age | gender | rank | specialty | deptNum |

|  |  |
| --- | --- |
| Co\_investigator | |
| snn | projNum |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Project | | | | | |
| projNum | sponsor | start\_date | end\_date | budget | prin\_investigator |

|  |  |
| --- | --- |
| Research\_Assistant | |
| snn | projNum |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Graduate | | | | | | |
| ssn | name | age | gender | degree\_program | advsr\_snn | deptNum |

|  |  |  |  |
| --- | --- | --- | --- |
| Department | | | |
| deptNum | name | main\_office | chairman |

CREATE TABLE Professor

(

ssn char(10),

name char(64),

age integer,

gender char(1),

rank integer,

specialty char(64),

deptNum integer,

PRIMARY KEY (ssn),

FOREIGN KEY (deptNum) REFERENCES Department (deptNum)

);

CREATE TABLE Project

(

projNum integer,

sponsor char(64),

start\_date char(20),

end\_date char(20),

budget float,

prin\_Investigator char(10),

PRIMARY KEY (projNum),

FOREIGN KEY (prin\_Investigator) REFERENCES Professor (ssn)

);

CREATE TABLE Graduate

(

ssn char(10),

age integer,

name char(64),

degree\_Program char(64),

gender char(1),

advsr\_ssn char(10),

deptNum integer,

PRIMARY KEY (ssn),

FOREIGN KEY (advsr\_ssn) REFERENCES Graduate(ssn) ON DELETE

RESTRICT ON UPDATE CASCADE,

FOREIGN KEY (deptNum) REFERENCES Department(deptNum)

);

CREATE TABLE Department

(

deptNum integer,

name char(64),

main\_office char(10),

chairman char(10),

PRIMARY KEY (deptNum),

FOREIGN KEY (chairman) REFERENCES Professor (ssn)

);

CREATE TABLE Co\_Investigator

(

ssn char(10),

projNum integer,

PRIMARY KEY (ssn, projNum),

FOREIGN KEY (ssn) References Professor (ssn)

ON DELETE CASCADE,

FOREIGN KEY (projNum) REFERENCES Project (projNum)

ON DELETE CASCADE

);

CREATE TABLE Research\_Assistant

(

ssn char (10),

projNum integer,

PRIMARY KEY (ssn, projNum),

FOREIGN KEY (ssn) REFERENCES Graduate (ssn)

ON DELETE CASCADE,

FOREIGN KEY (projNum) REFERENCES Project (projNum)

ON DELETE CASCADE

)

ALTER TABLE Professor ADD FOREIGN KEY (deptNum) References Department (deptNum);

ALTER TABLE Project ADD FOREIGN KEY (prin\_Investigator) References Professor (ssn);

ALTER TABLE Graduate ADD FOREIGN KEY (advsr\_ssn) References Graduate(ssn) ON DELETE RESTRICT ON UPDATE CASCADE;

ALTER TABLE Graduate ADD FOREIGN KEY (deptNum) References Department(deptNum);

ALTER TABLE department ADD FOREIGN KEY (chairman) References Professor (ssn);

CREATE FUNCTION female\_faculty() RETURNS REAL AS’

DECLARE

maleTol INTEGER :=0;

femaleTol INTEGER :=0;

percentage REAL :=0;

genderWhat CHAR;

BEGIN

FOR genderWhat IN SELECT gender FROM professor

LOOP

IF genderWhat = 'm'

THEN

maleTol = maleTol + 1;

END IF;

IF genderWhat = 'f'

THEN

femaleTol = femaleTol + 1;

END IF;

END LOOP;

percentage = (CAST(femaleTol AS REAL)/ (maleTol +femaleTol)) \* 100;

return percentage;

END;

‘LANGUAGE ‘plpgsql’;

CREATE FUNCTION total\_people(INTEGER) RETURNS INTEGER AS'

DECLARE

projectNum\_Loc ALIAS FOR $1;

projectWorkers INTEGER :=1;

assistant\_record research\_assistant%ROWTYPE;

co\_investigator\_record co\_investigator%ROWTYPE;

BEGIN

FOR assistant\_record IN SELECT \* FROM research\_Assistant

LOOP

IF assistant\_record.projnum = projectNum\_Loc

THEN

projectWorkers = projectWorkers + 1;

END IF;

END LOOP;

FOR co\_investigator\_record IN SELECT \* FROM co\_investigator

LOOP

IF co\_investigator\_record.projnum = projectNum\_Loc

THEN

projectWorkers = projectWorkers + 1;

END IF;

END LOOP;

RETURN projectWorkers;

END;'LANGUAGE 'plpgsql';

CREATE FUNCTION trigger\_GraduateMaxProject()

RETURNS TRIGGER AS '

DECLARE

studentNumber graduate.ssn%TYPE;

projectCount INTEGER :=0;

BEGIN

FOR studentNumber IN SELECT ssn FROM graduate

LOOP

projectCount := count(projNum) from research\_assistant

GROUP BY ssn having ssn = studentNumber;

IF projectCount > 2

THEN RAISE EXCEPTION

'Student cannot work on anymore Project. Max number is 2';

END IF;

END LOOP;

RETURN NEW;

END;

'LANGUAGE 'plpgsql';

CREATE TRIGGER student\_Trigger

AFTER INSERT OR UPDATE

ON research\_assistant

FOR EACH ROW EXECUTE PROCEDURE trigger\_graduatemaxproject();CREATE FUNCTION trigger\_projectemaxprojec

RETURNS TRIGGER AS ‘

DECLARE

projectID co\_investigator.projnum%TYPE;

co\_InvesCount INTEGER :=0;

BEGIN

FOR projectID IN SELECT projNum FROM co\_investigator

LOOP

co\_InvesCount := count(ssn) from co\_investigator GROUP BY projNum having projNum = projectID;

IF co\_InvesCount > 4

THEN RAISE EXCEPTION 'No faculty can work on this Project anymore. Max number is 4';

END IF;

END LOOP;

RETURN NEW;

END;

‘LANGUAGE ‘plpgsql’;

CREATE TRIGGER faculty\_restrict

AFTER INSERT OR UPDATE

ON co\_investigator

FOR EACH ROW EXECUTE PROCEDURE trigger\_projectemaxprojec();

insert into department (deptNum, name, main\_office)

values (40, 'Ghost', 'idk');

insert into professor (ssn, name, age, gender, rank, specialty, deptNum)

values ('000000', 'danny', 14, 'm', 4, 'ghost hunting', 40);

insert into graduate (ssn, age,name, degree\_program, gender,deptNum)

values ('1111111', 29, 'dimitri', 'Fairty Tales', 'm', 40);

insert into project (projNum,sponsor, start\_date, end\_date, budget, prin\_investigator)

Values (10, 'Toyota', 08/07/2009, 08/07/2019, 50000, '000000');

insert into research\_assistant (ssn, projNum)

values ('1111111',10)

insert into co\_investigator (ssn, projNum)

values (‘4444444’, 10)