Q1-1 ER Model Diagram
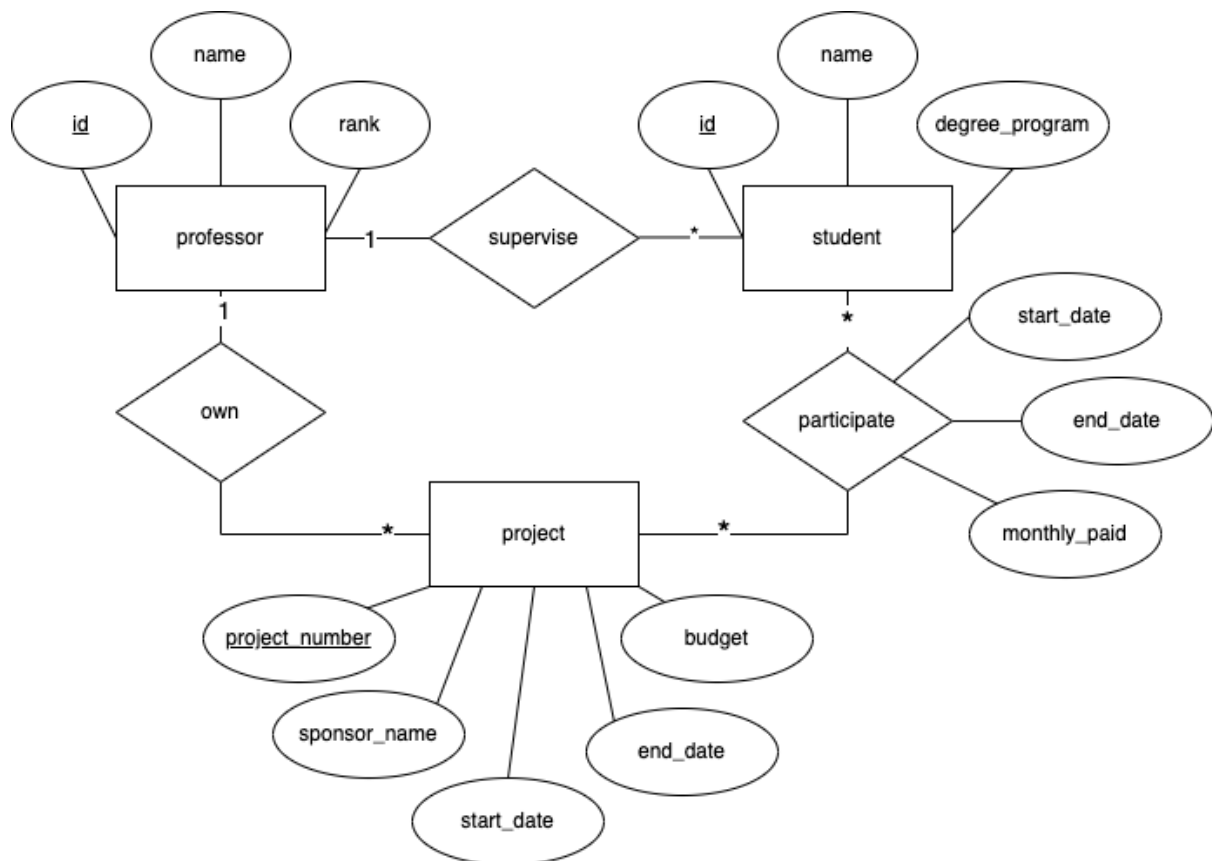

Q1-2 Relational Model

```sql
CREATE TABLE Professors (
  id   INTEGER,
  name VARCHAR(20),
  rank INTEGER,
  PRIMARY KEY (id)
);

CREATE TABLE Projects (
  project_number INTEGER,
  sponsor_name VARCHAR(20),
  start_date DATE,
  end_date DATE,
  budget REAL,
  professor_id INTEGER,
  PRIMARY KEY (project_number),
  FOREIGN KEY (professor_id) REFERENCES Professors(id)
);
```

```sql
CREATE TYPE degree_program_type AS ENUM (
  'Bachelor',
  'Master',
  'PhD'
);

CREATE TABLE Students (
  student_id INTEGER,
  student_name VARCHAR(20),
  degree_program degree_program_type,
  professor_id INTEGER,
  PRIMARY KEY (student_id),
  FOREIGN KEY (professor_id) REFERENCES Professors(id)
);

CREATE TABLE Students_projects (
  student_id INTEGER,
  project_number INTEGER,
  start_date DATE,
  end_date DATE,
  monthly_paid REAL,
  PRIMARY KEY (student_id, project_number),
  FOREIGN KEY (student_id) REFERENCES Students(student_id),
  FOREIGN KEY (project_number) REFERENCES Professors(id)
);
```

註：Sutdents_projects等同於ER Model的participate relation。

Q2 - Decomposition

forum_name	popularity
Gossiping	100
Joke	23

post_id	forum_name	title	article
131	Gossiping	Girlfriend	How can I get girlfriend ?
252	Gossiping	Firends	I don't have a friend...
46	Joke	Knock	Knock! Knock! ...
151	Joke	Santa Claus	Hold! Hold! Hold!

reply_id	post_id	reply
1	131	"Haha"
2	131	"I don't know"
3	252	"Haha"
4	252	"I can be"
5	252	"QQ"
6	46	"Then?"
7	46	"What's the point ?"
8	151	"XDD"

畫底線處為primary_key