**Exercise 1**

**Diagram

Description automatically generated**

In this ERD, the entities are manager, band and club. There is a primary key in every entity so to make sure making a relationship is possible. In the entity manager, the attributes are id, name, address and phone number. In the band entity, the attributes are name, the total number of musicians, types of music played, hiring fee, phone number, studio address, manager id (foreign key) and club id (foreign key). In the club entity, the attributes are id, name, address and phone number.

Here a band is managed by only one manager but a manager can manage multiple bands at a time. For a band, on a day only booking is opened but a club can book multiple bands on one day.

**Exercise 2**

Diagram

Description automatically generated

In this ERD, the entities are student, course and sub-course. There is a primary key and a foreign key in every entity to make sure making a relationship is possible. In student entity, the attributes are id, name, address, term address, phone number, subject choose, level, grade and course id (foreign key). In course entity, the attributes are id, name and number of students. In sub-course entity, the attributes are id, name and number of students.

Here a student can choose only one course but one course maybe choose by one or many students. Courses have sub-courses. One course may or may not contain sub-course and a sub-course may belong to one many courses, so a third entity is introduced, course\_sub-course. The common attribute is duration.

**Exercise 3**

**Diagram

Description automatically generated**

**In this ERD, the entities are faculty, department, courses, units and teaching staff. The attributes of faculty are id, name and number of departments. The attributes of department are id, faculty id (foreign key), name and no. of teaching members. In courses entity, the attributes are id, department key (extraterritorial key), name, number of students and number of courses. The unit entity contains id, name and number of students as attributes. The teaching staff entity consists of id, department id (foreign key), name, address, phone number, faculty head and department head.**

**Here, a faculty contain many department where a department belongs to only one faculty. A department run many courses and a course is ran by only department. A course is composed of many units and a unit may belongs to one or many courses. So a third entity is introduced, course\_units. A department contsists of many teaching staffs but a teaching staff may belong to only one deparment A teaching staff may teach one or many units and a unit maybe taught by one or many teaching staffs.**

**Exercise 4**

**Diagram

Description automatically generated**

In this ERD, the entities are RDA, nutritional value and ingredients. There is a primary key and foreign key in every entity to make sure making a relationship is possible. RDA entity contains patients id, name, address, phone number, diseases, description and treatment as attributes. Nutritional value entity contains id, RDA id (foreign key), ingredient id (foreign key), calories, protein, vitamin, fiber, minerals, sugar, fat and oil and carbohydrates as attributes. In ingredient entity, the attribute are id, name and type.

Here, RDA consists of variety of nutritional value but a specific variety of nutritional value is recommended for only one patient. An ingredient consists of various nutritional value and specific amount nutritional value is contained by only one ingredient.

**Exercise 5**

**Diagram

Description automatically generated**

**In this ERD, the entities are client, projects, sites and programmer. There is a primary key and foreign key in every entity to make sure making a relationship is possible. In client entity, the attributes are id, name, address, phone number, date, project order, project completed and amount paid. In projects entity, the attributes are id, client id (foreign id), name, started date, completed date, emplpoyee required and sites used. In sites entity, id and project worked on are attributes. In programmer entity , the attributes are id, project id (foreign key), name, address, phone number, project worked on and sites used.**

**Here, a client may have zero or many projects but a project belongs to only one client. A project is worked on many sites and a site works on many projects so, a need for third entity arises with common attributes as programmers required. At one time one programmer works on zero or only one projects. A programmer may work on zero sites or many sites at a time and a sites may need one or many programmer. Thus a third entity with common attribute, contribution, is introduced.**