Potter Times has opened its own Cinema and is expanding rapidly. Initially, Potter Times stored data in a file-based system, which was then transitioned into using spreadsheets. As years progressed, their business has grown exponentially leading to an increase in the number of branches and customers across the country. You are hired as a consultant to develop a prototype database. You can assume the Information Technology (IT) staff will develop the applications using the prototype database. Below are some of the specifications you collected from the initial meetings with the managers of business units. You will develop a prototype database based on your meetings, and you acknowledge that not all attributes are included.

Below are the business rules you have been given by Potter Times:

· Potter Times has 34 branches across Australia. You can assume same services are provided across all locations. Every branch is uniquely identified in the system. Other details which the system needs to store about a cinema are name, address, website, and contact number.

· Every staff member is provided with a unique staff number. The company also needs to keep track of other details about their staff members like their name, address, contact number and date of birth. Staff can either be a manager, a technical support, a general assistant, a ticket clerk, or a bar staff. For the manager and the technical support staff, their salaries need to be recorded. For the general assistants, ticket clerks and bar staff, their hourly rate and hours per week are recorded. A technical support staff can either be a senior technical support or a junior technical support staff. A junior technical staff’s education degree, year of completion and ATAR (Australian Tertiary Admission Rank) are recorded, whereas a senior technical staff’s years of experience is recorded.

· Both managers and technical support staff are employed on a full-time basis whereas general assistants, ticket clerks, and bar staff work on a part-time basis. Every cinema branch employs multiple employees. Every part-time employee can work at multiple branches whereas full time employees can only work at one branch. A cinema is managed by only one manager, who has only one senior technical support staff and at least one general assistant for each movie screening. More than one junior technical support staff can work at the same time, which, however, is not required. A bar staff is only required for night movies, whereas at least one ticket clerk is needed in each location during business hours, with more ticket clerks needed in busy hours.

· A cinema branch has multiple theatres, and a theatre must belong to only one particular branch. Every theatre is uniquely identified in the system. Other details of a theatre include the name, description, and capacity. A theatre is either categorised as a normal theatre, a 3D theatre, or a gold theatre.

· Each theatre plays several movies and movies can be played across several theatres at the same time simultaneously. Every movie has a unique code. The description of every movie included in the system is the name, type of movies (genre), year, classification (such as PG, M, G), rating, and duration.

· A loyal customer may join the Potter Club and become a club member to enjoy discounts and special amenities. You can assume the normal customer details such as customer ID, customer name, address (including state and postcode), and mobile number are recorded. Additional details for a club member, such as the year they joined, amenity preference, and the discount value are also stored.

· An event (e.g., a birthday party) may be booked by a customer for a particular theatre at a branch with a featured movie. The date, the time, the number of people and the cost of the booking are also stored.

**Required:**

With reference to the above scenario, answer the following **two** questions:

1. Using Crow’s Foot notation to create an **Entity Relationship Diagram** (ERD) that provides a suitable model based on the above business rules. You can state your **assumptions**, but they must be reasonable。波特时代已经开设了自己的电影院，并且正在迅速扩张。最初，波特时代在一个基于文件的系统中存储数据，然后过渡到使用电子表格。随着时间的推移，他们的业务呈指数级增长，导致在全国各地的分行和客户数量增加。你被聘为顾问来开发一个原型数据库。您可以假设信息技术(IT)人员将使用原型数据库开发应用程序。下面是您从最初与业务部门经理的会议中收集到的一些规范。您将基于您的会议开发一个原型数据库，并且您承认并不是所有属性都包含在内。

以下是《哈利·波特时代》给你的商业规则:

•波特时代在澳大利亚有34家分店。您可以假设在所有位置提供相同的服务。每个分支在系统中都是唯一标识的。系统需要存储的关于电影院的其他细节包括名称、地址、网站和联系电话。

•每个工作人员都有一个独特的员工编号。公司还需要跟踪员工的其他细节，如姓名、地址、联系电话和出生日期。员工可以是经理、技术支持人员、一般助理、售票员或酒吧工作人员。对于经理和技术支持人员，他们的工资需要记录。对于一般助理、售票员和酒保，他们每小时的工资和每周工作时间都被记录下来。技术支持人员可以是高级技术支持人员，也可以是初级技术支持人员。初级技术人员的教育学位、毕业年份和ATAR(澳大利亚高等教育录取等级)将被记录，而高级技术人员的经验年数将被记录。

经理和技术支持人员都是全职工作，而一般助理、售票员和酒吧工作人员是兼职工作。每个电影院分店都有多个雇员。每个兼职员工可以在多个分支机构工作，全职员工只能在一个分支机构工作。电影院由一个经理管理，每个经理有一个高级技术支持人员和至少一个一般助理负责电影放映。一个以上的初级技术支持人员可以同时工作，但是，这不是必需的。只有在晚上看电影的时候才需要一个酒吧服务员，而在营业时间每个地点至少需要一个售票员，在繁忙时间需要更多的售票员。

•一个电影院分支有多个电影院，而一个电影院必须只属于一个特定的分支。每个剧院在系统中都有独特的标识。剧院的其他细节包括名称、描述和容量。剧院分为普通剧院、3D剧院和黄金剧院。

•每个剧院播放多部电影，并且电影可以在多个剧院同时播放。每部电影都有一个独特的代码。系统中包含的每一部电影的描述包括名称、电影类型(类型)、年份、分类(例如PG、M、G)、等级和持续时间。

•忠实客户可以加入波特俱乐部，成为俱乐部会员，享受折扣和特殊的设施。您可以假设记录了正常的客户详细信息，如客户ID、客户名称、地址(包括州和邮政编码)和手机号码。俱乐部成员的其他细节，如他们加入的年份、舒适偏好和折扣价值也被存储。

•一个活动(例如，生日派对)可能会被客户在分店的特定影院预订，并有一部特色电影。日期、时间、人数和预订成本也会被存储。

要求:

针对上述场景，回答以下两个问题:

(a)使用鱼尾纹符号创建一个实体关系图(ERD)，该实体关系图根据上述业务规则提供一个合适的模型。你可以陈述你的假设，但必须是合理的。