Introduction

A hostel mess operates and serves a number of meals during the day to the students residing in the hostel. The current system being followed requires that each student pay a fixed mess fee at the beginning of the year. In the case when a student is not eating in the mess, he can take a mess off and the fee for those days will be waived. However this is a problem if we consider the fact that a student’s absence from the mess may not be continuous but scattered for eg he may eat in the mess for two days then not eat the next day,then again eat for three days, then not eat for the next two days etc. In this case, it would be very cumbersome for a student to get a mess off for each absence. This problem is prevalent in all the hostels across our institute and in such cases, the students do not even bother to get a mess off whenever they are absent from the mess.

As a result of this, every student pays a fixed amount of money irrespective of the number of meals eaten in the mess. In order to solve this problem, we have created a mess management system so that each student only pays for the amount he eats. Whenever the student enters the mess, he will be required to mark his biometric attendance. This facility is already available in other areas of our college and can also be extended to the mess.

The students information including his Name, Room No, Amount due etc. is stored in the database. The mess caterers also maintain information about the meal schedule in their mess, the cost for each meal, the cost for extra items and the cost for each utensil in the mess in the database. For every meal that the student eats in the mess, the cost is added to the Amount Due by him. Whenever he issues any extra items, the cost for that is also added to his Amount Due. In the case where a student steals or damages any of the utensils in the mess, the charge for the utensil will be added to the amount due to damage in his database. At the end of every month, the student is required to pay whatever amount he owes.

In the same way, information is maintained for every visitor who comes to the mess for eg parent of student, students from other colleges coming for fests etc. The visitor is required to give his attendance as well and at the end of the visitors stay, the amount that he has to pay is generated in the same way as done for the student. Once the visitor leaves the college, his information is deleted.

This also solves the current problem of the mess staff having to manually maintain records of who has taken extra items and manually figuring out the amount that each student owes.

List of Entities

1. Student
2. Mess
3. Visitor
4. Meal type
5. Utensil Type

Entity Structure and Attributes

1. Student

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Description** | **Constraints** |
| RNo | INT | Roll no of student | PRIMARY KEY |
| Name | VARCHAR(32) | Name of student | NOT NULL |
| RoomNo | INT | Room Number of student | NOT NULL |
| AmountDamage | FLOAT | Amount owed for damage of mess property. |  |
| AmountFood | FLOAT | Amount that the student currently owes calculated based upon the number of times he has eaten in the mess and the type of meal. |  |

2) Mess

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Description** | **Constraints** |
| Time | DATETIME | Timings for each meal in the mess | PRIMARY KEY |
| ExtraCharge | FLOAT | Extra Item Charges | NOT NULL |
| Meal | INT | Breakfast, Lunch or Dinner(A Meal ID From Meal table) | FOREIGN KEY |
| Utensil | INT | Type of Utensil(A UtensilID from Utensil table) | FOREIGN KEY |

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Description** | **Constraints** |
| ID | INT | ID for each visitor to the mess | PRIMARY KEY |
| VisitorName | VARCHAR(32) | Name of Visitor | NOT NULL |
| FoodCharge | FLOAT | Amount that the visitor currently owes calculated based upon the number of times he has eaten in the mess and the type of meal. |  |
| DamageCharge | FLOAT | Amount owed for damage of mess property. |  |

3)Visitor

4) Meal

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Description** | **Constraints** |
| MealID | INT | ID for each meal(Breakfast, Lunch or Dinner) | PRIMARY KEY |
| MealCost | FLOAT | Cost for the meal | NOT NULL |

5) Utensil

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Description** | **Constraints** |
| UtensilID | INT | ID for each utensil | PRIMARY KEY |
| Quantity | INT | Quantity of each utensil | NOT NULL |
| UtensilCost | FLOAT | Cost of each utensil | NOT NULL |

Primary Keys and Foreign Keys

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SN** | **Table** | **Primary Key** | **Foreign Keys** | |
| **Column** | **References** |
| 1 | Student | RNo | - | - |
| 2 | Mess | Time | Meal | Meal.MealID |
| Utensil | Utensil.UtensilID |
| 3 | Visitor | ID | - | - |
| 4 | Meal | MealID | - | - |
| 5 | Utensil | UtensilID | - | - |

SQL Table Creations and Insertions

Create Table Student

**CREATE** **TABLE** student(

RNo INT **PRIMARY** **KEY** ,  
Name VARCHAR( 32 ) [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
RoomNo INT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
AmountDamage FLOAT,  
AmountFood FLOAT

)

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[ [Edit](http://localhost/phpmyadmin/tbl_sql.php?db=messmanagement&table=student&sql_query=create+table+student%28%0D%0A++++RNo+INT+PRIMARY+KEY%2C%0D%0A++++Name+VARCHAR%2832%29+NOT+NULL%2C%0D%0A++++RoomNo+INT+NOT+NULL%2C%0D%0A++++AmountDamage+FLOAT%2C%0D%0A++++AmountFood+FLOAT%29&show_query=1&token=18e064c94f19b3b6b21126e615a855b4#querybox) ] [ [Create PHP Code](http://localhost/phpmyadmin/import.php?db=messmanagement&table=student&sql_query=create+table+student%28%0D%0A++++RNo+INT+PRIMARY+KEY%2C%0D%0A++++Name+VARCHAR%2832%29+NOT+NULL%2C%0D%0A++++RoomNo+INT+NOT+NULL%2C%0D%0A++++AmountDamage+FLOAT%2C%0D%0A++++AmountFood+FLOAT%29&show_query=1&show_as_php=1&token=18e064c94f19b3b6b21126e615a855b4) Top of Form

Insert values into Student

[**INSERT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Finsert.html&token=18e064c94f19b3b6b21126e615a855b4) **INTO** student  
**VALUES** ( 1, 'Dhruv Prakash', 269, 100, 100 )

Create table Visitor

**CREATE** **TABLE** visitor(

Id INT **PRIMARY** **KEY** ,  
VisitorName VARCHAR( 32 ) [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
FoodCharge FLOAT,  
DamageCharge FLOAT

)

Insert into Visitor

[**INSERT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Finsert.html&token=18e064c94f19b3b6b21126e615a855b4) **INTO** visitor  
**VALUES** ( 1, 'Gaurav Yadav', 0, 0 )

Create Table Meal

**CREATE** **TABLE** Meal(

MealID INT **PRIMARY** **KEY** ,  
MealCost FLOAT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL**

)

Insert into Meal

[**INSERT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Finsert.html&token=18e064c94f19b3b6b21126e615a855b4) **INTO** Meal  
**VALUES** ( 1, 350 )

Create Table Utensil

**CREATE** **TABLE** Utensil(

UtensilId INT **PRIMARY** **KEY** ,  
Quantity INT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
UtensilCost FLOAT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL**

)

Insert into Table Utensil

[**INSERT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Finsert.html&token=18e064c94f19b3b6b21126e615a855b4) **INTO** utensil  
**VALUES** ( 3, 20, 300 )

Create Table Mess

**CREATE** **TABLE** mess(

TIME DATETIME **PRIMARY** **KEY** ,  
ExtraCharge FLOAT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
Meal INT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
Utensil INT [**NOT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Flogical-operators.html%23operator_not&token=18e064c94f19b3b6b21126e615a855b4) **NULL** ,  
**CONSTRAINT** fk\_Route **FOREIGN** **KEY** ( Meal ) **REFERENCES** Meal( MealID ) ,  
**CONSTRAINT** fk\_Route1 **FOREIGN** **KEY** ( Utensil ) **REFERENCES** Utensil( UtensilID )

)

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[ [Edit](http://localhost/phpmyadmin/tbl_sql.php?db=messmanagement&table=utensil&sql_query=Create+Table+mess%28%0D%0A++++TIME+DATETIME+PRIMARY+KEY%2C%0D%0A++++ExtraCharge+FLOAT+NOT+NULL%2C%0D%0A++++Meal+INT+NOT+NULL%2C%0D%0A++++Utensil+INT+NOT+NULL%2C%0D%0A++++CONSTRAINT+fk_Route+FOREIGN+KEY+%28Meal%29+REFERENCES+Meal%28MealID%29%2C%0D%0A++++CONSTRAINT+fk_Route1+FOREIGN+KEY+%28Utensil%29+REFERENCES+Utensil%28UtensilID%29%29&show_query=1&token=18e064c94f19b3b6b21126e615a855b4#querybox) ] [ [Create PHP Code](http://localhost/phpmyadmin/import.php?db=messmanagement&table=utensil&sql_query=Create+Table+mess%28%0D%0A++++TIME+DATETIME+PRIMARY+KEY%2C%0D%0A++++ExtraCharge+FLOAT+NOT+NULL%2C%0D%0A++++Meal+INT+NOT+NULL%2C%0D%0A++++Utensil+INT+NOT+NULL%2C%0D%0A++++CONSTRAINT+fk_Route+FOREIGN+KEY+%28Meal%29+REFERENCES+Meal%28MealID%29%2C%0D%0A++++CONSTRAINT+fk_Route1+FOREIGN+KEY+%28Utensil%29+REFERENCES+Utensil%28UtensilID%29%29&show_query=1&show_as_php=1&token=18e064c94f19b3b6b21126e615a855b4) ]

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Insert into Table Mess

[**INSERT**](http://localhost/phpmyadmin/url.php?url=http%3A%2F%2Fdev.mysql.com%2Fdoc%2Frefman%2F5.5%2Fen%2Finsert.html&token=18e064c94f19b3b6b21126e615a855b4) **INTO** Mess  
**VALUES** (

'11:30', 300, 1, 3

)

**Cardinality**

M= Many and N=0,1,2…

|  |  |  |
| --- | --- | --- |
| S.No | Entities | Cardinality |
| 1 | Mess and Meal | 1:1 |
| 2 | Mess and Utensil | 1:1 |

**Functional Dependencies**

1) Student

* RNo->Name,RoomNo,AmountDamage,AmountFood
* Name,RoomNo->AmountDamage,AmountFood

2) Mess

* Time->ExtraCharge,Meal,Utensil
* ExtraCharge->Meal,Utensil

3) Visitor

* ID->VisitorName,FoodCharge,DamageCharge
* ID,VisitorName->FoodCharge,DamageCharge

4) Meal

* MealId->MealCost

5) Utensil

* UtensilID->Quantity,UtensilCost
* Quantity->UtensilCost

**Final ER Diagram**

Visitor

Student

c

of

off

Utensil

Meal

Mess