A Hostel Swapping Database Management Project
Report submitted for Database Management System
(UCS310)
by

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Problem Statement

Developing a hostel swapping management system in order to effectively manage the hostel allocation and swapping process. Every semester when it comes to hostel room allocation, students run into issues when they don't receive the room/hostel of their choice. Because there is no proper/formal manner of addressing these difficulties, students choose for an informal mode of communication, such as chat groups, in order to obtain the room of their choice. These methods frequently prove to be more difficult alternatives. Our idea will offer students how to swap rooms not only within the hostel, but also between hostels.

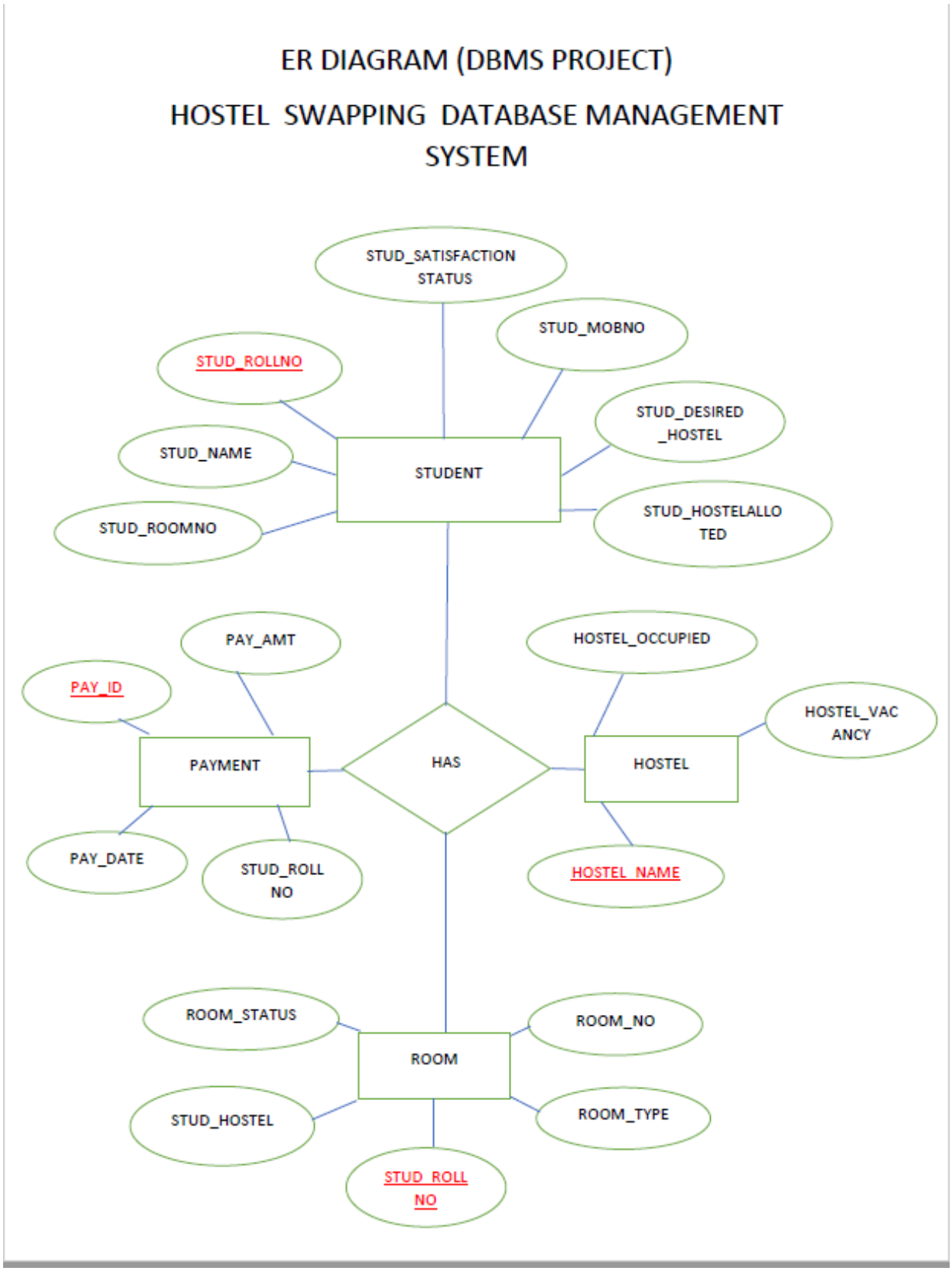
Overview

Organizations such as colleges have to allocate different hostels to different students on the basis of their preferences during hostel swapping and hence have to deal with a lot of data. Hence it is very important for such organizations to have a DBMS with a frontend that easily allows students to swap hostels without any chaos.

Functional Requirements

1. Separate interfaces for students and hostel management. Students and management system i.e. warden, caretaker etc. should have separate logins.
2. Allow students to choose if they are satisfied with their room/hostel or not.
3. Allow students to view/update/cancel already booked room if necessary.
4. Cancelled room should create free slots for other students.
5. The system should avoid clash of booked room.
6. Both students should be able access each other's phone number and some details.

ER Diagram


ER DIAGRAM (DBMS PROJECT)
HOSTEL SWAPPING DATABASE MANAGEMENT SYSTEM
STUD_SATISFACTION STATUS
STUD_MOBNO
STUD_ROLLNO
STUD_DESIRED _HOSTEL
STUD_NAME
STUDENT
STUD_ROOMNO
STUD_HOSTELALLO TED
PAY_AMT
HOSTEL_OCCUPIED
PAY_ID
HOSTEL_VAC ANCY
PAYMENT
HAS
HOSTEL
PAY_DATE
STUD_ROLL NO
HOSTEL_NAME
ROOM_STATUS
ROOM_NO
ROOM
STUD_HOSTEL
ROOM_TYPE
STUD_ROLL NO

Relational Schemas

1. Student

STUD_ROLLNO	STUD_NAME	STUD_ROOMNO	STUD_SATIS	STUD_MOB	STUD_HOSTEL

2. Payment

PAY_ID	STUD_ROLLNO	PAY_DATE	PAY_AMT

3. Room

STUD_ROLLNO	STUD_ROOMNO	ROOM_TYPE	STUD_HOSTEL	ROOM_STATUS

1. Hostel

H_NAME	VACANCY	OCCUPIED

UNNORMALIZED TABLE:

+Stud_name	Stud_Rollno	Stud_Roomno	Stud_satisfaction	Stud_mobile	Stud_hostel	Desired Hostel	Room_type	Pay_id	Pay_date
Aashima	534	334	Yes	9987383773	PG	-	2S AC	T53T7E	2022-03-21
Riddhi	693	128	No	7283746299	G	I	1S	HF8EU9	2022-03-19
Chirag	782	456	No	8937351274	H	K	3S AC	H6738W	2022-03-22
Nitin	916	349	No	7783913579	K	H	2S AC	98YR82	2022-03-21
Tia	824	139	Yes	9827746382	I	-	3S AC	2EH9U8	2022-03-22
Aman	756	140	No	8397560980	H	K	3S AC	3H345L	2022-03-20

NORMALIZED TABLES:

STUDENT TABLE:

Stud_name	Stud_Rollno	Stud_Roomno	Stud_satisfaction	Stud_mobile	Stud_hostel	Desired Hostel
Aashima	534	334	Yes	9987383773	PG	-
Riddhi	693	128	No	7283746299	G	I
Chirag	782	456	No	8937351274	H	K
Nitin	916	349	No	7783913579	K	H
Tia	824	139	Yes	9827746382	I	-
Aman	756	140	No	8397560980	H	K

PAYMENT TABLE:

Pay_amt	Stud_Rollno	Pay_id	Pay_date
32500	534	T53T7E	2022-03-21
37200	693	HF8EU9	2022-03-19
31300	782	H6738W	2022-03-22
35100	916	98YR82	2022-03-21
33200	824	2EH9U8	2022-03-22
31300	756	3H345L	2022-03-20

ROOM TABLE:

Room_status	Room_no.	Room_type	Hostel	Stud_Rollno
Occupied	334	2S AC	PG	534
Occupied	128	1S	G	693
Occupied	456	3S AC	H	782
Occupied	349	2S AC	K	916
Occupied	139	3S AC	I	824
Occupied	140	3S AC	H	756

HOSTEL TABLE:

Hostel	Vacancy	Alloted
PG	12	338
G	7	143
H	23	477
K	27	323
I	13	137

Functional Dependencies and Normalization

1. **Student**:
   R = (Stud_name, Stud_Rollno. , Stud_Roomno , Stud_satisfaction, Stud_mobile, Stud_hostel, Desired hostel) FDs:
   a. Stud_Rollno. -> Stud_name
   b. Stud_Rollno. -> Stud_Roomno
   c. Stud_Rollno. -> Stud_satisfaction
   d. Stud_Rollno. -> Stud_mobile
   e. Stud_Rollno. -> Stud_hostel
   f. Stud_Rollno. -> Desired_hostel

   Table is in 1NF since all attributes are atomic.

   Table is in 2NF since there is no partial dependency.

   Table is in 3NF due to absence of any transitive dependency.

2. **Payment:**

   R = (Pay_amt, Stud_Rollno., Pay_id, Pay_date) FDs:

   a. Pay_id -> Pay_amt
   b. Pay_id -> Stud_rollno
   c. Pay_id -> Pay_date

   Table is in 1NF since all attributes are atomic.

   Table is in 2NF since there is no partial dependency.

   Table is in 3NF due to absence of any transitive dependency.

3. **Room :**

   R = (Room_status, Room_no., Room_type, Hostel, Stud_Rollno.) FDs:

   a. Stud_Rollno -> Room_status
   b. Stud_Rollno -> Room_no.
   c. Stud_Rollno -> Room_type
   d. Stud_Rollno -> Hostel

   Table is in 1NF since all attributes are atomic.

   Table is in 2NF since there is no partial dependency.

   Table is in 3NF due to absence of any transitive dependency.

4. **Hostel:**

   R = (Hostel,Vaccancy,Alloted)FDs:

   a. Hostel -> Vaccancy
   b. Hostel -> Alloted

   Table is in 1NF since all attributes are atomic.

   Table is in 2NF since there is no partial dependency.

   Table is in 3NF due to absence of any transitive dependency.

PL/SQL Code to Implement Project Functionalities

```
create table Student(
 Stud_rollNO int PRIMARY KEY,
Stud_roomNo int NOT NULL,
Stud_Name varchar(10) NOT NULL,
Stud_Mob number(10) NOT NULL,
Stud_Hostel varchar(10),
Stud_satisfac varchar(10),
Stud_des_hostel varchar(3)
);
insert into Student values(534,334,'Aashima',9987383773,'PG','YES',NULL);
insert into Student values(693,128,'Riddhi',7283746299,'G','NO','I');
insert into Student values(782,456,'Chirag',8937351274,'H','NO','K');
insert into Student values(916,349,'Nitin',7783913579,'K','NO','H');
insert into Student values(824,139,'Tia',9827746382,'I','YES',NULL);
insert into Student values(756,140,'Aman',8397560980,'H','YES',NULL);
create table payment(
pay_id varchar(7) PRIMARY KEY,
Stud_rollno int  references Student(Stud_rollNO),
pay_amt int NOT NULL,
pay_date varchar(10)
);

insert into payment values('T53T7E',534,32500,2022-03-21);
insert into payment values('HF8EU9',693,37200,2022-03-19);
insert into payment values('H6738W',782,31300,2022-03-22);
insert into payment values('98YR82',916,35100,2022-03-21);
```

```
insert into payment values('2EH9U8',824,33200,2022-03-22);
insert into payment values('3H345L',756,31300,2022-03-20);
create table hostel(
hname varchar(3) PRIMARY KEY,
vacancy int,
occupied int
);
insert into hostel values('PG',12,338);
insert into hostel values('G',7,143);
insert into hostel values('H',23,477);
insert into hostel values('K',27,323);
insert into hostel values('I',13,137);
create table room(
Stud_rollno int  references Student(Stud_rollNO),
room_status varchar(10),
Stud_roomNo int NOT NULL,
room_type varchar(10),
Stud_Hostel varchar(10)
);
insert into room values(534,'occupied',334,'2s-ac','PG');
insert into room values(693,'occupied',128,'1s-ac','G');
insert into room values(782,'occupied',456,'3s-ac','H');
insert into room values(916,'occupied',349,'2s-ac','K');
insert into room values(824,'occupied',139,'3s-ac','I');
insert into room values(756,'occupied',140,'3s-ac','H');
select * from Student;
select * from payment;
select * from hostel;
```

```
select * from room;
select * from Student where Stud_satisfac='NO';
  Select * from Student where Stud_Hostel IN
(Select Stud_des_hostel from Student where Stud_satisfac='NO')
AND Stud_des_hostel IN
(Select Stud_Hostel from Student where Stud_satisfac='NO')AND Stud_satisfac='NO' ;
 update Student
 set Stud_Hostel=Stud_des_hostel,Stud_satisfac='YES',Stud_des_hostel=NULL
 where Stud_des_hostel IN
( Select Stud_Hostel from Student where Stud_Hostel IN
(Select Stud_des_hostel from Student where Stud_satisfac='NO')
 AND Stud_des_hostel IN
 (Select Stud_Hostel from Student where Stud_satisfac='NO'))
AND Stud_satisfac='NO' ;
 select * from Student;
--PL/SQL Code
 declare
rows number(5);
begin
update Student
set Stud_Hostel=Stud_des_hostel,Stud_satisfac='YES',Stud_des_hostel=NULL
 where  Stud_Hostel IN(select hname from hostel where vacancy >0 ) AND
Stud_satisfac='NO';
if SQL%NOTFOUND then
dbms_output.put_line('No Vacancy Available');
elsif SQL%FOUND then
 update hostel
 set vacancy=vacancy-1,occupied=occupied +1
```

```
 where hname IN(select Stud_Hostel from Student where Stud_satisfac='NO')AND
vacancy>0;

dbms_output.put_line('Room alloted');

end if;

end;

select * from hostel;

--PL/SQL Code

declare cursor c1 is  select * from Student where Stud_satisfac='YES';

rec c1%rowtype;

begin

open c1;

loop

fetch c1 into rec;

exit when c1%notfound;

dbms_output.put_line(' stud-rollno-> ' ||rec.Stud_rollNO||  ' stud-roomno ->'
||rec.Stud_roomNo||' stud-name ->'|| rec.Stud_Name|| ' stud-mob-> '||rec.Stud_Mob|| '
stud-satisfaction-> '|| rec.Stud_satisfac|| ' stud-hostel -
>'||rec.Stud_Hostel||rec.Stud_des_hostel);

end loop;

close c1;

end;

select * from student;
```

Screenshots

STUDENT Table:

STUD_ROLLNO	STUD_ROOMNO	STUD_NAME	STUD_MOB	STUD_HOSTEL	STUD_SATISFAC	STUD_DES_HOSTEL
534	334	Aashima	9987383773	PG	YES	-
693	128	Riddhi	7283746299	G	NO	I
782	456	Chirag	8937351274	H	NO	K
916	349	Nitin	7783913579	K	NO	H
824	139	Tia	9827746382	I	YES	-
756	140	Aman	8397560980	H	YES	-

Download CSV

6 rows selected.

PAYMENT Table:

PAY_ID	STUD_ROLLNO	PAY_AMT	PAY_DATE
T53T7E	534	32500	1998
HF8EU9	693	37200	2000
H6738W	782	31300	1997
98YR82	916	35100	1998
2EH9U8	824	33200	1997
3H345L	756	31300	1999

Download CSV

6 rows selected.

HOSTEL Table:

HNAME	VACANCY	OCCUPIED
PG	12	338
G	7	143
H	23	477
K	27	323
I	13	137

Download CSV

5 rows selected.

ROOM Table:

STUD_ROLLNO	ROOM_STATUS	STUD_ROOMNO	ROOM_TYPE	STUD_HOSTEL
534	occupied	334	2s-ac	PG
693	occupied	128	1s-ac	G
782	occupied	456	3s-ac	H
916	occupied	349	2s-ac	K
824	occupied	139	3s-ac	I
756	occupied	140	3s-ac	H

Download CSV

6 rows selected.

Students who are not satisfied with their hostel allotment -

STUD_ROLLNO	STUD_ROOMNO	STUD_NAME	STUD_MOB	STUD_HOSTEL	STUD_SATISFAC	STUD_DES_HOSTEL
693	128	Riddhi	7283746299	G	NO	I
782	456	Chirag	8937351274	H	NO	K
916	349	Nitin	7783913579	K	NO	H

Download CSV

3 rows selected.

STUD_ROLLNO	STUD_ROOMNO	STUD_NAME	STUD_MOB	STUD_HOSTEL	STUD_SATISFAC	STUD_DES_HOSTEL
916	349	Nitin	7783913579	K	NO	H
782	456	Chirag	8937351274	H	NO	K

Download CSV

2 rows selected.

Students who have option to swap and get their desired hostel.

Hostels swapped

2 row(s) updated.

STUD_ROLLNO	STUD_ROOMNO	STUD_NAME	STUD_MOB	STUD_HOSTEL	STUD_SATISFAC	STUD_DES_HOSTEL
534	334	Aashima	9987383773	PG	YES	-
693	128	Riddhi	7283746299	G	NO	I
782	456	Chirag	8937351274	K	YES	-
916	349	Nitin	7783913579	H	YES	-
824	139	Tia	9827746382	I	YES	-
756	140	Aman	8397560980	H	YES	-

Download CSV

6 rows selected.

Now, Checking for vacancy for those students which have no student to swap hostel with

HNAME	VACANCY	OCCUPIED
PG	12	338
G	7	143
H	23	477
K	27	323
I	13	137

Download CSV

5 rows selected.

Vacancy available and room allotted.

```
Statement processed.
Room alloted
```

Vacancy is occupied .

HNAME	VACANCY	OCCUPIED
PG	12	338
G	6	144
H	23	477
K	27	323
I	13	137

Download CSV

5 rows selected.

```
Statement processed.
 stud-rollno-> 534 stud-roomno ->334 stud-name ->Aashima stud-mob-> 9987383773 stud-satisfaction-> YES stud-hostel ->PG
 stud-rollno-> 693 stud-roomno ->128 stud-name ->Riddhi stud-mob-> 7283746299 stud-satisfaction-> YES stud-hostel ->I
 stud-rollno-> 782 stud-roomno ->456 stud-name ->Chirag stud-mob-> 8937351274 stud-satisfaction-> YES stud-hostel ->K
 stud-rollno-> 916 stud-roomno ->349 stud-name ->Nitin stud-mob-> 7783913579 stud-satisfaction-> YES stud-hostel ->H
 stud-rollno-> 824 stud-roomno ->139 stud-name ->Tia stud-mob-> 9827746382 stud-satisfaction-> YES stud-hostel ->I
 stud-rollno-> 756 stud-roomno ->140 stud-name ->Aman stud-mob-> 8397560980 stud-satisfaction-> YES stud-hostel ->H
```

Finally, all students have been successfully allotted their desired hostel

STUD_ROLLNO	STUD_ROOMNO	STUD_NAME	STUD_MOB	STUD_HOSTEL	STUD_SATISFAC	STUD_DES_HOSTEL
534	334	Aashima	9987383773	PG	YES	-
693	128	Riddhi	7283746299	I	YES	-
782	456	Chirag	8937351274	K	YES	-
916	349	Nitin	7783913579	H	YES	-
824	139	Tia	9827746382	I	YES	-
756	140	Aman	8397560980	H	YES	-

Download CSV

6 rows selected.