

For question 1a:

Creating database **Accomodation** and creating *student*, *student\_hostel* and *hostel* tables then inserting records using the following commands as shown in the 2 screenshots below


*create database accomodation;*

*create table student (student\_id varchar(5) primary key, first\_name varchar(50) not null, last\_name varchar(50) not null, gender varchar(6) not null, program\_of\_study varchar(60) not null, age smallint );*

*create table Student\_Hostel (Student\_ID varchar(5) not null, Hostel\_ID varchar(5) not null, Hostel\_Room\_Number smallint not null);*

*create table Hostel (Hostel\_ID varchar(5) primary key, Hostel\_Name varchar(40) not null, Hostel\_Representative varchar(50), Hostel\_Rooms smallint );*

**this is the output:**



```
SQL Shell (psql)
postgres=# create database accomodation;
CREATE DATABASE
postgres=# create table student (student_id varchar(5) primary key, first_name varchar(50) not null, last_name varchar(50) not null, gender varchar(6) not null, program_of_study varchar(60) not null, age smallint );
CREATE TABLE
postgres=# create table Student_Hostel (Student_ID varchar(5) not null, Hostel_ID varchar(5) not null, Hostel_Room_Number smallint not null);
CREATE TABLE
postgres=# create table Hostel (Hostel_ID varchar(5) primary key, Hostel_Name varchar(40) not null, Hostel_Representative varchar(50), Hostel_Rooms smallint );
CREATE TABLE
```

This is for the insertion of data

```
SQL Shell (psql)
postgres=# insert into student (student_id,first_name,last_name,gender,program_of_study,age)
postgres=# values('N0001','Ken','Kandoje','male','Bsc in computer network engineering','23'),
postgres=# ('N0002','Chifuniro','Phiri','male','Bsc in Geology','22'),
postgres=# ('N0003','Lonjezo','Kanyongo','male','Bed in Language','21'),
postgres=# ('N0004','Stephanol','Chicklewalker','male','Bsoc in Gender studies','20'),
postgres=# ('N0005','Vivian','Messie','Female','Bsc in Electronic','20'),
postgres=# ('N0006','Funny','Chilemba','Female','Bed in Biology','20'),
postgres=# ('N0007','Memory','James','Female','Bsc in infomation Systems','19'),
postgres=# ('N0008','Mary','Ben','Female','Bsc in Chemitry','21'),
postgres=# ('N0009','Magret','Wasili','Female','Bed in Chemistry','19'),
postgres=# ('N0010','Cynthia','banda','Female','Bsc in Physics','20');
INSERT 0 10
postgres=# insert into Hostel(Hostel_ID,Hostel_Name,Hostel_Representative,Hostel_Rooms)
postgres=# values('KMG','Kamungu','Chifuniro Phiri','29'),
postgres=# ('BNG','Bangwe','Rabeccah Banda','29'),
postgres=# ('KMS','Kamsesa','Tamah Kondowe','32'),
postgres=# ('LNG','Longwe','James Mphoya','29'),
postgres=# ('CLM','Chilembwe','Paul Magaleta','32'),
postgres=# ('MSO','Msonthe','Patrick Chisale','129'),
postgres=# ('TOW','Towe','Peter Kayira','19');
INSERT 0 7
postgres=# insert into student_Hostel(Student_ID,Hostel_ID,Hostel_Room_Number)
postgres=# values('N0001','KMG','12'),
postgres=# ('N0002','KMG','13'),
postgres=# ('N0003','BNG','9'),
postgres=# ('N0004','KMS','11'),
postgres=# ('N0005','LNG','20'),
postgres=# ('N0006','CLM','30'),
postgres=# ('N0007','LNG','15');
INSERT 0 7
```

**For question 2**(Display all the students that have been allocated rooms in different hostels): using the inner join as shown below to display students with the rooms

```
SQL Shell (psql)
postgres=# select student.student_id,student.First_name,student.last_name,student
_hostel.hostel_id,student_hostel.hostel_room_number
postgres=# from student
postgres=# inner join student_hostel
postgres=# on student.student_id = student_hostel.student_id;
 student_id | first_name | last_name | hostel_id | hostel_room_number
-----+-----+-----+-----+-----
 N0001      | Ken        | Kandoje   | KMG       | 12
 N0002      | Chifuniro  | Phiri     | KMG       | 13
 N0003      | Lonjezo    | Kanyongo  | BNG       | 9
 N0004      | Stephanol  | Chicklewaker | KMS       | 11
 N0005      | Vivian     | Messie    | LNG       | 20
 N0006      | Funny      | Chilemba  | CLM       | 30
 N0007      | Memory     | James     | LNG       | 15
(7 rows)
```

For question 3: Display all students that do not belong to any hostel

Using **LEFT OUTER JOIN** syntax where the relationship between the student id and hostel id shows allocation of the room such that those names without hostel id have no rooms allocated to them , using these commands:

```
select student.student_id,student.First_name,student.last_name,student_hostel.hostel_id,
student_hostel.hostel_room_number
from student
left outer join student_hostel
on student.student_id = student_hostel.student_id;
```

below is the output:

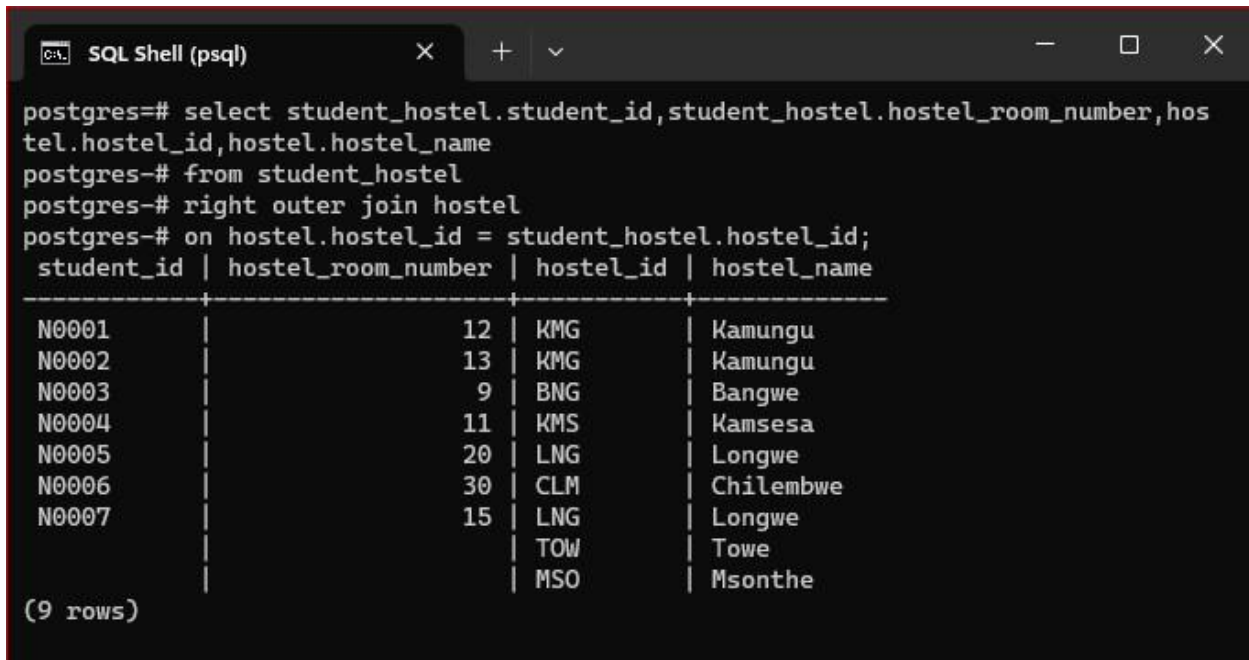
```
SQL Shell (psql)
postgres=# select student.student_id,student.First_name,student.last_name,student
_hostel.hostel_id,student_hostel.hostel_room_number
postgres=# from student
postgres=# left outer join student_hostel
postgres=# on student.student_id = student_hostel.student_id;
 student_id | first_name | last_name | hostel_id | hostel_room_number
-----+-----+-----+-----+-----
 N0001      | Ken        | Kandoje   | KMG       | 12
 N0002      | Chifuniro  | Phiri     | KMG       | 13
 N0003      | Lonjezo    | Kanyongo  | BNG       | 9
 N0004      | Stephanol  | Chicklewaker | KMS       | 11
 N0005      | Vivian     | Messie    | LNG       | 20
 N0006      | Funny      | Chilemba  | CLM       | 30
 N0007      | Memory     | James     | LNG       | 15
 N0010      | Cynthia    | banda     |           |
 N0009      | Magret     | Wasili    |           |
 N0008      | Mary       | Ben       |           |
(10 rows)
```

**FOR QUESTION 4:** Check if there are hostels without students

At this point we use **RIGHT OUTER JOIN** to combine the hostel and student hostels because they have common record '*hostel-id*', using these commands :

```
select student_hostel.student_id,student_hostel.hostel_room_number,hostel.hostel_id,
hostel.hostel_name
from student_hostel
full outer join hostel
on hostel.hostel_id = student_hostel.hostel_id;
```

Down, is the output.



```
SQL Shell (psql)
postgres=# select student_hostel.student_id,student_hostel.hostel_room_number,hos
tel.hostel_id,hostel.hostel_name
postgres=# from student_hostel
postgres=# right outer join hostel
postgres=# on hostel.hostel_id = student_hostel.hostel_id;
 student_id | hostel_room_number | hostel_id | hostel_name
-----|-----|-----|-----
 N0001      |          12        | KMG       | Kamungu
 N0002      |          13        | KMG       | Kamungu
 N0003      |           9        | BNG       | Bangwe
 N0004      |          11        | KMS       | Kamsesa
 N0005      |          20        | LNG       | Longwe
 N0006      |          30        | CLM       | Chilembwe
 N0007      |          15        | LNG       | Longwe
           |                   | TOW       | Towe
           |                   | MSO       | Msonthe
(9 rows)
```

**for question 5:** Check all students without hostels and all hostels without students. Here I used full outer join to join all three tables using *student\_hostel* as junction table using these commands

```

select student.student_id,student.First_name,student.last_name,student_hostel.hostel_room_number,
hostel.hostel_id,hostel.hostel_name
from student
full outer join student_hostel
on student.student_id = student_hostel.student_id
full outer join hostel
on student_hostel.hostel_id = hostel.hostel_id;
below is the output.

```

```

postgres=# select student.student_id,student.First_name,student.last_name,student_hostel.hostel_id,student
_hostel.hostel_room_number,hostel.hostel_id,hostel.hostel_name
postgres=# from student
postgres=# full outer join student_hostel
postgres=# on student.student_id = student_hostel.student_id
postgres=# full outer join hostel
postgres=# on student_hostel.hostel_id = hostel.hostel_id;
 student_id | first_name | last_name | hostel_id | hostel_room_number | hostel_id | hostel_name
-----
N0001      | Ken        | Kandoje   | KMG       | 12                | KMG       | Kamungu
N0002      | Chifuniro | Phiri     | KMG       | 13                | KMG       | Kamungu
N0003      | Lonjezo   | Kanyongo  | BNG       | 9                 | BNG       | Bangwe
N0004      | Stephanol | Chickewalker | KMS       | 11                | KMS       | Kamsesa
N0005      | Vivian    | Messie    | LNG       | 20                | LNG       | Longwe
N0006      | Funny     | Chilemba  | CLM       | 30                | CLM       | Chilembwe
N0007      | Memory    | James     | LNG       | 15                | LNG       | Longwe
N0010      | Cynthia   | banda     |           |                   |           |
N0009      | Magret    | Wasili    |           |                   |           |
N0008      | Mary      | Ben       |           |                   |           |
           |           |           |           |                   | TOW       | Towe
           |           |           |           |                   | MSO       | Msonthe
(12 rows)

```