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Documentation of cs301 course project

A)Tables and their details

Valid_tickets table - all the valid tickets are stored in this table(conditions to valid are mentioned in flow chart)

```
create table valid_tickets(pnr int primary key,
                           trainno int,
                           noofpassengers int,
                           coach varchar(7),
                          journeydate char(10),
                          p1 varchar(10),
                           a1 int,
                           g1 varchar(6),
                           c1 int,
                           b1 char(2),
                           s1 int,
                           p2 varchar(10),
                           a2 int,
                           g2 varchar(6),
                           c2 int,
                           b2 char(2),
                           s2 int,
                           p3 varchar(10),
                           a3 int,
                           g3 varchar(6),
                           c3 int,
                           b3 char(2),
                           s3 int,
                           p4 varchar(10),
                           a4 int,
                           g4 varchar(6),
                           c4 int,
                           b4 char(2),
                           s4 int,
                           p5 varchar(10),
                           a5 int,
                           g5 varchar(6),
                           c5 int,
```

```
                                        b5 char(2),
                                        s5 int,
                                        p6 varchar(10),
                                        a6 int,
                                        g6 varchar(6),
                                        c6 int,
                                        b6 char(2),
                                        s6 int,
                                        foreign key(trainno, journeydate) references
trains(trainno, journeydate)
                                       foreign key(pnr,trainno,
                                    journeydate,noofpassengers,coach,p1,a1,g1,c1,b1,s1,p2,a2,g
                                    2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b
                                    5,s5,p6,a6,g6,c6,b6,s6) references tickets(pnr,trainno,
                                    journeydate,noofpassengers,coach,p1,a1,g1,c1,b1,s1,p2,a2,g
                                    2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b
                                    5,s5,p6,a6,g6,c6,b6,s6)

                                       );
```

Tickets table - all tickets entered in the form are added to this table

```
create table tickets(pnr int primary key,
                                        trainno int,
                                        noofpassengers int,
                                        coach varchar(7),
                                       journeydate char(10),
                                       p1 varchar(10),
                                        a1 int,
                                        g1 varchar(6),
                                        c1 int,
                                        b1 char(2),
                                        s1 int,
                                        p2 varchar(10),
                                        a2 int,
                                        g2 varchar(6),
                                        c2 int,
                                        b2 char(2),
                                        s2 int,
                                        p3 varchar(10),
                                        a3 int,
                                        g3 varchar(6),
                                        c3 int,
                                        b3 char(2),
                                        s3 int,
```

```
    p4 varchar(10),
    a4 int,
    g4 varchar(6),
    c4 int,
    b4 char(2),
    s4 int,
    p5 varchar(10),
    a5 int,
    g5 varchar(6),
    c5 int,
    b5 char(2),
    s5 int,
    p6 varchar(10),
    a6 int,
    g6 varchar(6),
    c6 int,
    b6 char(2),
    s6 int,
   );
```

Accoach table - seating in ac coach

```
create table accoach(seat_no int primary key,berth char(2));
```

Sleepercoach table - seating in sleeper coach

```
create table sleepercoach(seat_no int primary key,berth char(2));
```

Booking_agent - all booking agents entered in booking agent portal

```
create table booking_agent(bname varchar(255),bcred int primary key,badd varchar(255));
```

Trains - only valid trains are present in this table(conditions to valid are mentioned in flow chart)

```
create table trains(
        trainno int not null,
        journeydate char(10) not null,
        noofaccoaches int,
        noofsleepercoaches int,
        acseatsbooked int,
        sleeperseatsbooked int,
        primary key(trainno, journeydate),
        foreign key(trainno , journeydate) references from all_trains(trainno,journeydate)
```

);

All_trains - all trains entered in the portal will be inserted in this table

```
create table all_trains(tid int primary key, trainno int,
                                        journeydate char(10),
                                        noofaccoaches int,
                                        noofsleepercoaches int,
                                        acseatsbooked int,
                                        sleeperseatsbooked int
                                );
```

B)Stored procedures and triggers

Stored Procedures

stored procedure for train booking - updates seats booked in trains table, check conditions in flow chart, inserts into table tickets, assigns berth and seat no to passengers

```
create or replace procedure ticket_booking(in pnr int ,IN train_no int,IN no_p int,IN coach
varchar(7),IN journey_date char(10),
                                                IN p1
varchar(30),IN a1 int,IN g1 varchar(6),
                                                IN p2
varchar(30),IN a2 int,IN g2 varchar(6),
                                                IN p3
varchar(30),IN a3 int,IN g3 varchar(6),
                                                IN p4
varchar(30),IN a4 int,IN g4 varchar(6),
                                                IN p5
varchar(30),IN a5 int,IN g5 varchar(6),
                                                IN p6
varchar(30),IN a6 int,IN g6 varchar(6)
                                                )
language plpgsql
as
$$
declare

c1 int;
```

```
b1 char(2);
s1 int;
c2 int;
b2 char(2);
s2 int;
c3 int;
b3 char(2);
s3 int;
c4 int;
b4 char(2);
s4 int;
c5 int;
b5 char(2);
s5 int;
c6 int;
b6 char(2);
s6 int;
f record;
begin
select * from trains into f where trains.trainno = train_no and trains.journeydate =
journey_date;
if coach = 'sleeper' and (f.noofsleepercoaches*24 - f.sleeperseatsbooked >= no_p ) then
        if no_p = 1 then
                update trains set sleeperseatsbooked = sleeperseatsbooked + 1 where
trainno = train_no;
                s1 = f.sleeperseatsbooked%24 + 1;
                c1 = (f.sleeperseatsbooked)/24 + 1;
                select berth from  sleepercoach into b1 where sleepercoach.seat_no = s1;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);
        elseif no_p = 2 then
                update trains set sleeperseatsbooked = sleeperseatsbooked + 2 where
trainno = train_no;
                s1 = f.sleeperseatsbooked%24 + 1;
                c1 = (f.sleeperseatsbooked)/24 + 1;
                select berth from sleepercoach into b1 where sleepercoach.seat_no = s1;
                s2 = f.sleeperseatsbooked%24 + 2;
                c2 = (f.sleeperseatsbooked+1)/24 + 1;
                select berth from sleepercoach into b2 where sleepercoach.seat_no = s2;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 3 then
```

```
                update trains set sleeperseatsbooked = sleeperseatsbooked + 3 where
trainno = train_no;
                s1 = f.sleeperseatsbooked%24 + 1;
                c1 = (f.sleeperseatsbooked)/24 + 1;
                select berth from sleepercoach into b1 where sleepercoach.seat_no = s1;
                s2 = f.sleeperseatsbooked%24 + 2;
                c2 = (f.sleeperseatsbooked+1)/24 + 1;
                select berth from sleepercoach into b2 where sleepercoach.seat_no = s2;
                s3 = f.sleeperseatsbooked%24 + 3;
                c3 = (f.sleeperseatsbooked+2)/24 + 1;
                select berth from sleepercoach into b3 where sleepercoach.seat_no = s3;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 4 then
                update trains set sleeperseatsbooked = sleeperseatsbooked + 4 where
trainno = train_no;
                s1 = f.sleeperseatsbooked%24 + 1;
                c1 = (f.sleeperseatsbooked)/24 + 1;
                select berth from sleepercoach into b1 where sleepercoach.seat_no = s1;
                s2 = f.sleeperseatsbooked%24 + 2;
                c2 = (f.sleeperseatsbooked+1)/24 + 1;
                select berth from sleepercoach into b2 where sleepercoach.seat_no = s2;
                s3 = f.sleeperseatsbooked%24 + 3;
                c3 = (f.sleeperseatsbooked+2)/24 + 1;
                select berth from sleepercoach into b3 where sleepercoach.seat_no = s3;
                s4 = f.sleeperseatsbooked%24 + 4;
                c4 = (f.sleeperseatsbooked+3)/24 + 1;
                select berth from sleepercoach into b4 where sleepercoach.seat_no = s4;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 5 then
                update trains set sleeperseatsbooked = sleeperseatsbooked + 5 where
trainno = train_no;
                s1 = f.sleeperseatsbooked%24 + 1;
                c1 = (f.sleeperseatsbooked)/24 + 1;
                select berth from sleepercoach into b1 where sleepercoach.seat_no = s1;
                s2 = f.sleeperseatsbooked%24 + 2;
                c2 = (f.sleeperseatsbooked+1)/24 + 1;
                select berth from sleepercoach into b2 where sleepercoach.seat_no = s2;
                s3 = f.sleeperseatsbooked%24 + 3;
                c3 = (f.sleeperseatsbooked+2)/24 + 1;
                select berth from sleepercoach into b3 where sleepercoach.seat_no = s3;
```

```
                s4 = f.sleeperseatsbooked%24 + 4;
                c4 = (f.sleeperseatsbooked+3)/24 + 1;
                select berth from sleepercoach into b4 where sleepercoach.seat_no = s4;
                s5 = f.sleeperseatsbooked%24 + 5;
                c5 = (f.sleeperseatsbooked+4)/24 + 1;
                select berth from sleepercoach into b5 where sleepercoach.seat_no = s5;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 6 then
                update trains set sleeperseatsbooked = sleeperseatsbooked + 5 where
trainno = train_no;
                s1 = f.sleeperseatsbooked%24 + 1;
                c1 = (f.sleeperseatsbooked)/24 + 1;
                select berth from sleepercoach into b1 where sleepercoach.seat_no = s1;
                s2 = f.sleeperseatsbooked%24 + 2;
                c2 = (f.sleeperseatsbooked+1)/24 + 1;
                select berth from sleepercoach into b2 where sleepercoach.seat_no = s2;
                s3 = f.sleeperseatsbooked%24 + 3;
                c3 = (f.sleeperseatsbooked+2)/24 + 1;
                select berth from sleepercoach into b3 where sleepercoach.seat_no = s3;
                s4 = f.sleeperseatsbooked%24 + 4;
                c4 = (f.sleeperseatsbooked+3)/24 + 1;
                select berth from sleepercoach into b4 where sleepercoach.seat_no = s4;
                s5 = f.sleeperseatsbooked%24 + 5;
                c5 = (f.sleeperseatsbooked+4)/24 + 1;
                select berth from sleepercoach into b5 where sleepercoach.seat_no = s5;
                s6 = f.sleeperseatsbooked%24 + 6;
                c6 = (f.sleeperseatsbooked+5)/24 + 1;
                select berth from sleepercoach into b6 where sleepercoach.seat_no = s6;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        end if;

elseif coach = 'ac' and (f.noofaccoaches*18 - f.acseatsbooked >= no_p ) then
        if no_p = 1 then
                update trains set acseatsbooked = acseatsbooked + 1 where trainno =
train_no;
                s1 = f.acseatsbooked%18 + 1;
                c1 = (f.acseatsbooked)/18 + 1;
                select berth from accoach into b1 where accoach.seat_no = s1;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
```

```
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);
        elseif no_p = 2 then
                update trains set acseatsbooked = acseatsbooked + 2 where trainno =
train_no;
                s1 = f.acseatsbooked%18 + 1;
                c1 = (f.acseatsbooked)/18 + 1;
                select berth from accoach into b1 where accoach.seat_no = s1;
                s2 = f.acseatsbooked%18 + 2;
                c2 = (f.acseatsbooked+1)/18 + 1;
                select berth from accoach into b2 where accoach.seat_no = s2;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 3 then
                update trains set acseatsbooked = acseatsbooked + 3 where trainno =
train_no;
                s1 = f.acseatsbooked%18 + 1;
                c1 = (f.acseatsbooked)/18 + 1;
                select berth from accoach into b1 where accoach.seat_no = s1;
                s2 = f.acseatsbooked%18 + 2;
                c2 = (f.acseatsbooked+1)/18 + 1;
                select berth from accoach into b2 where accoach.seat_no = s2;
                s3 = f.acseatsbooked%18 + 3;
                c3 = (f.acseatsbooked+2)/18 + 1;
                select berth from accoach into b3 where accoach.seat_no = s3;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 4 then
                update trains set acseatsbooked = acseatsbooked + 4 where trainno =
train_no;
                s1 = f.acseatsbooked%18 + 1;
                c1 = (f.acseatsbooked)/18 + 1;
                select berth from accoach into b1 where accoach.seat_no = s1;
                s2 = f.acseatsbooked%18 + 2;
                c2 = (f.acseatsbooked+1)/18 + 1;
                select berth from accoach into b2 where accoach.seat_no = s2;
                s3 = f.acseatsbooked%18 + 3;
                c3 = (f.acseatsbooked+2)/18 + 1;
                select berth from accoach into b3 where accoach.seat_no = s3;
                s4 = f.acseatsbooked%18 + 4;
                c4 = (f.acseatsbooked+3)/18 + 1;
                select berth from accoach into b4 where accoach.seat_no = s4;
```

```
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 5 then
                update trains set acseatsbooked = acseatsbooked + 5 where trainno =
train_no;
                s1 = f.acseatsbooked%18 + 1;
                c1 = (f.acseatsbooked)/18 + 1;
                select berth from accoach into b1 where accoach.seat_no = s1;
                s2 = f.acseatsbooked%18 + 2;
                c2 = (f.acseatsbooked+1)/18 + 1;
                select berth from accoach into b2 where accoach.seat_no = s2;
                s3 = f.acseatsbooked%18 + 3;
                c3 = (f.acseatsbooked+2)/18 + 1;
                select berth from accoach into b3 where accoach.seat_no = s3;
                s4 = f.acseatsbooked%18 + 4;
                c4 = (f.acseatsbooked+3)/18 + 1;
                select berth from accoach into b4 where accoach.seat_no = s4;
                s5 = f.acseatsbooked%18 + 5;
                c5 = (f.acseatsbooked+4)/18 + 1;
                select berth from accoach into b5 where accoach.seat_no = s5;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        elseif no_p = 6 then
                update trains set acseatsbooked = acseatsbooked + 6 where trainno =
train_no;
                s1 = f.acseatsbooked%18 + 1;
                c1 = (f.acseatsbooked)/18 + 1;
                select berth from accoach into b1 where accoach.seat_no = s1;
                s2 = f.acseatsbooked%18 + 2;
                c2 = (f.acseatsbooked+1)/18 + 1;
                select berth from accoach into b2 where accoach.seat_no = s2;
                s3 = f.acseatsbooked%18 + 3;
                c3 = (f.acseatsbooked+2)/18 + 1;
                select berth from accoach into b3 where accoach.seat_no = s3;
                s4 = f.acseatsbooked%18 + 4;
                c4 = (f.acseatsbooked+3)/18 + 1;
                select berth from accoach into b4 where accoach.seat_no = s4;
                s5 = f.acseatsbooked%18 + 5;
                c5 = (f.acseatsbooked+4)/18 + 1;
                select berth from accoach into b5 where accoach.seat_no = s5;
                s6 = f.acseatsbooked%18 + 6;
                c6 = (f.acseatsbooked+5)/18 + 1;
```

```
                select berth from accoach into b6 where accoach.seat_no = s6;
                insert into tickets values (pnr, train_no , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);

        end if;
else
                insert into tickets values (pnr, 1 , no_p , coach , journey_date , p1, a1,
g1,c1,b1,s1
,p2,a2,g2,c2,b2,s2,p3,a3,g3,c3,b3,s3,p4,a4,g4,c4,b4,s4,p5,a5,g5,c5,b5,s5,p6,a6,g6,c6,b6,s
6);


end if;
end;
$$
```

stored procedure for train release - checks the condition given in flowchart, inserts into all_trains table

```
create or replace procedure train_release(tid int,tno int,jdate char(10),accoaches int,
sleepercoaches int, acbooked int, sleeperbooked int)
language plpgsql
as
$$
declare
f record;
currdate char(10);
begin
select current_date into currdate;

select * from trains into f where trains.trainno=tno and trains.journeydate=jdate;
if not found then
        if currdate<jdate then
                insert into all_trains
values(tid,tno,jdate,accoaches,sleepercoaches,acbooked,sleeperbooked);
        else
                insert into all_trains
values(tid,1,jdate,accoaches,sleepercoaches,acbooked,sleeperbooked);
        end if;
else
insert into all_trains values(tid,1,jdate,accoaches,sleepercoaches,acbooked,sleeperbooked);

end if;
```

```
end;
$$
```

Triggers

trigger for valid_ticket insert - fires when there is an insert into tickets table, inserts valid(which satisfies conditions in flowchart) tickets into valid_tickets table

```
create or replace function ticket_insert()
returns trigger
language plpgsql
as
$$
begin
if new.trainno <> 1 then
insert into valid_tickets values
(new.trainno,new.noofpassengers,new.coach,new.journeydate,new.p1,new.a1,new.g1,new.
c1,new.b1,new.s1,new.p2,new.a2,new.g2,new.c2,new.b2,new.s2,new.p3,new.a3,new.g3,ne
w.c3,new.b3,new.s3,new.p4,new.a4,new.g4,new.c4,new.b4,new.s4,new.p5,new.a5,new.g5,
new.c5,new.b5,new.s5,new.p6,new.a6,new.g6,new.c6,new.b6,new.s6);
end if;
return new;
end;
$$

create trigger ticket_insert_trigger
after insert
on tickets
for each statement
execute procedure ticket_insert();
```

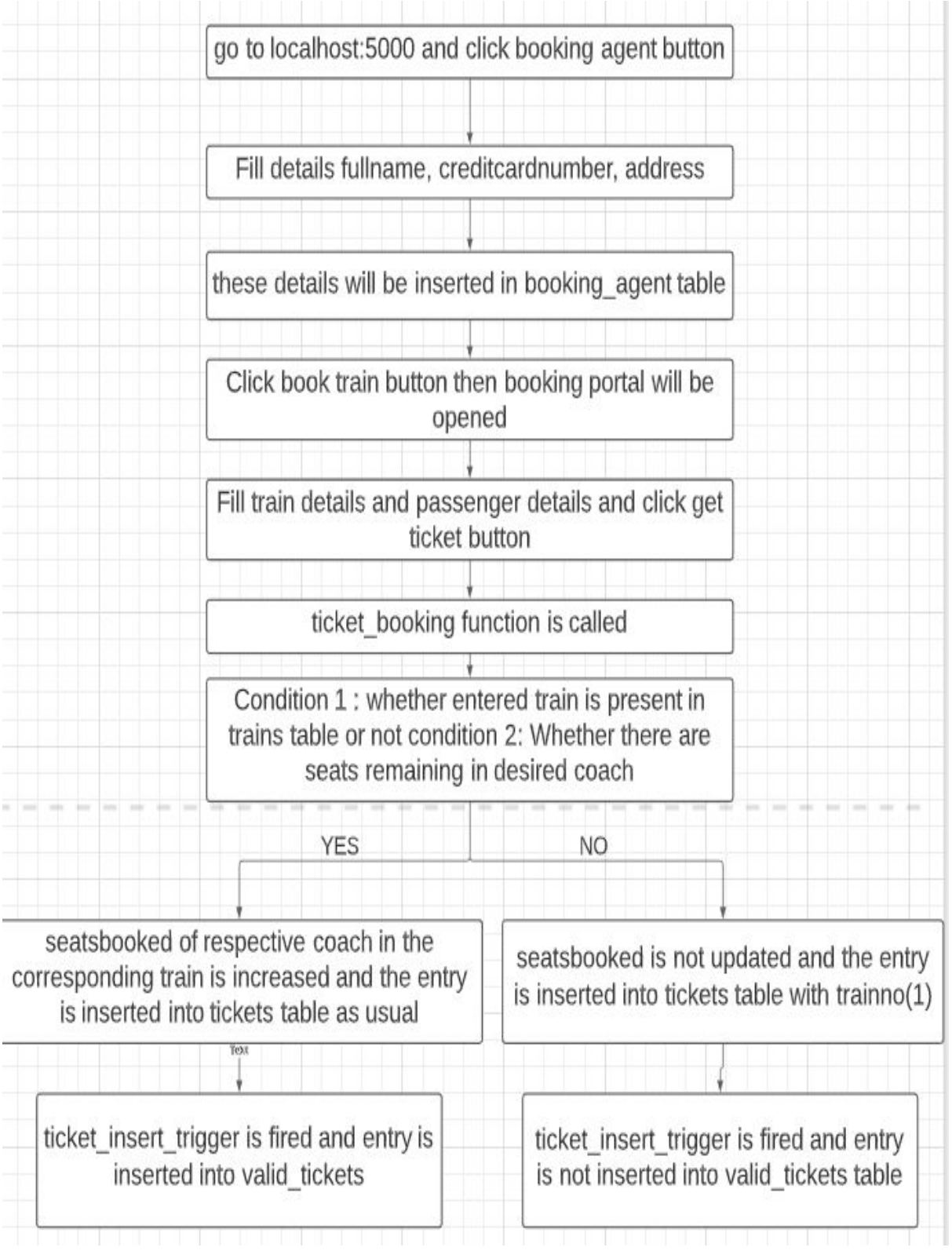
trigger for train insert - fires when there is an insert into all_trains table, inserts valid(which satisfies conditions in flowchart) trains into trains table

```
create function train_insert()
returns trigger
language plpgsql
as
$$
```

```
begin
if new.trainno <> 1 then
insert into trains values
(new.trainno,new.journeydate,new.noofaccoaches,new.noofsleepercoaches,new.acseatsbo
oked,new.sleeperseatsbooked);
end if;
return new;
end;
$$

create trigger train_insert_trigger
after insert
on all_trains
for each statement
execute procedure train_insert();
```

C)Ticket booking procedure



D)Train release procedure