



**NATIONAL INSTITUTE OF TECHNOLOGY
WARANGAL**

**DATABASE MANAGEMENT SYSTEM
PROJECT REPORT
RUNNING CREW MANAGEMENT FOR RAILWAYS**

DESIGNED BY

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PROBLEM STATEMENT:

Our comprehensive database system is designed to efficiently store and monitor critical details and status updates of railway crew. It provides a centralized platform for easy tracking of crew status, training, and medical fitness records, also with an efficient algorithm that retrieves crew availability and enables duty assignments. Our database also tracks crew movement on duty, recording distance covered which will be useful for mileage calculations. All the records of on duty and off duty of each crew will be maintained in the database up to date and can later be useful if any issue occurs or find the previous status of the crew, etc. Our system ensures only medically and technically fit crew are assigned duties, enhancing railways safety and efficiency. Accurate records can be maintained, progress be monitored, and salaries calculated based on performance.

ASSUMPTIONS:

1. DataOf: Each crew member has their own data, and no data is left without being associated with a crew member, hence a one-to-one relationship with total participation.
2. Dependents: A crew member may or may not have a dependent, but a dependent belongs to only one crew member, resulting in partial participation for crew members and total participation for dependents.

3. Each crew member has their own status and medical, and every status and medical is associated with a single crew member, leading to a one-to-one relationship with total participation for both.

4. Fortnight details: Every crew member is associated with at least one fortnight detail, and each fortnight detail is associated with a single crew member, resulting in total participation for both entities and a many-to-one relationship between fortnight details and crew members.

5. Previous trainings: Some crew members may not have previous trainings, but every trained crew member has a previous training record, resulting in partial participation for crew members and total participation for trained crew members. It is a many-to-one relationship between previous_trainings and crew members.

6. Status: Crew members must belong to any one of the status(OnDuty, Off Duty, Trainee) as part of total participation. This disjoint nature ensures that a crew member can only be in one status at a time.

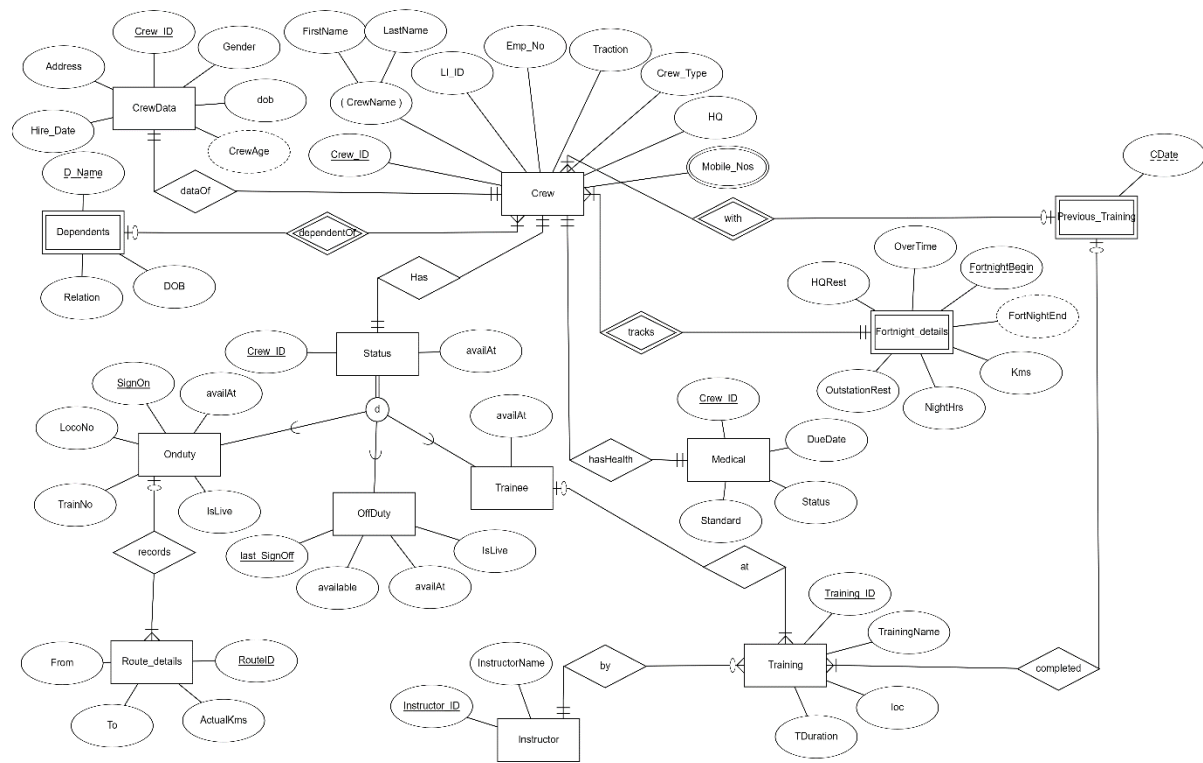
7. Every OnDuty has a route associated (total participation), but some routes may not be recorded yet in OnDuty at a given instance (partial participation). It is a many-to-one relationship from OnDuty to Route_details, ensuring different RouteIDs cannot be associated with the same OnDuty.

8. Trainee: Trainees must attend training (total participation), but not all trainings may take place at a given instance (partial participation). It is a one-to-many relationship between trainings and trainees.

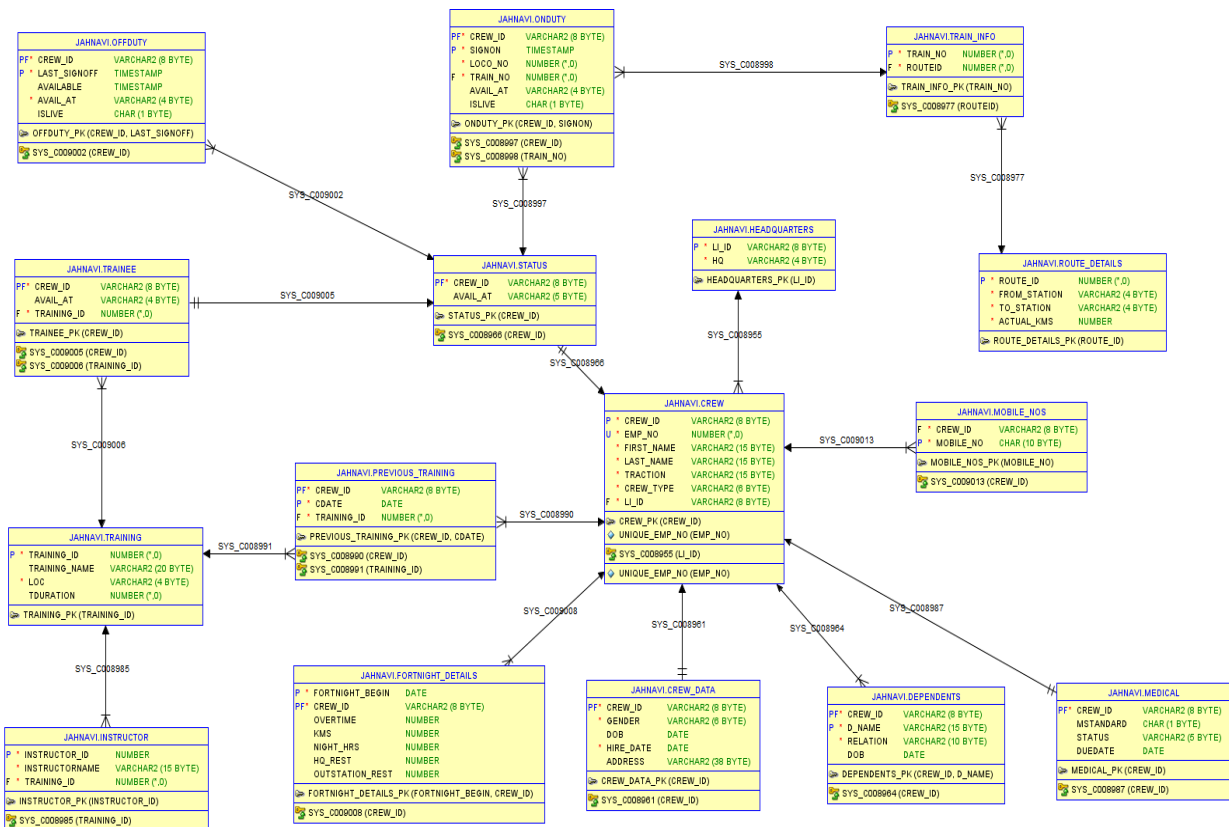
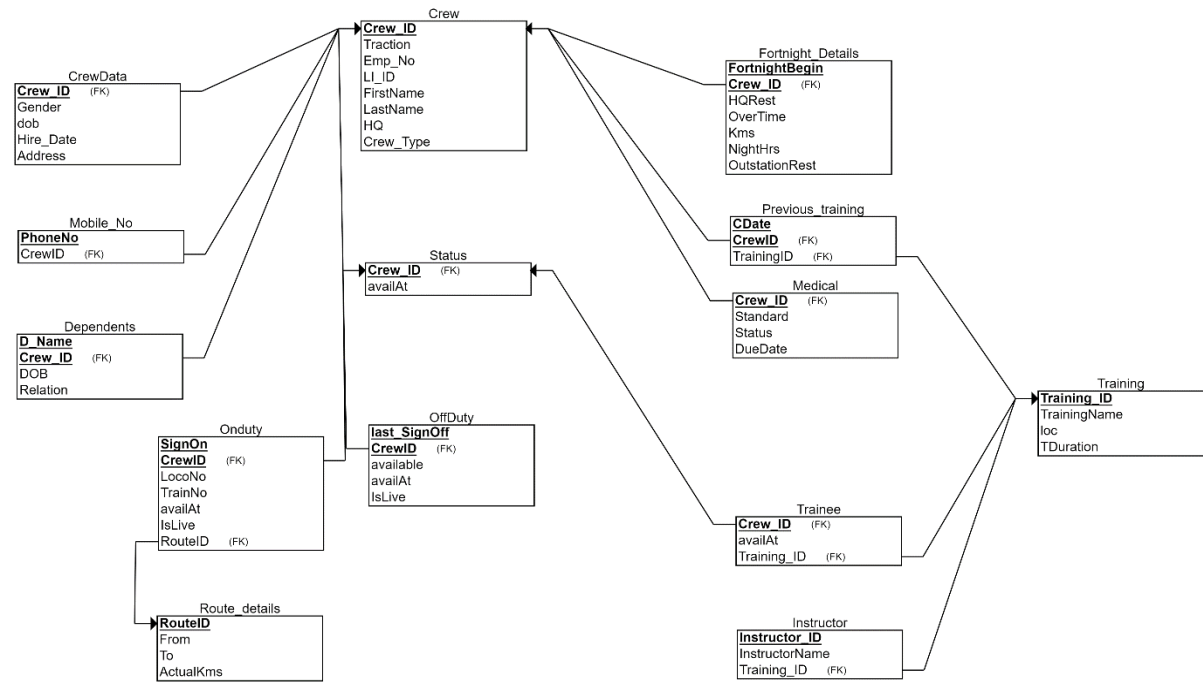
9. Total participation in previous_training and one-to-many relationship between training and previous_trainings, also our database prevents multiple trainings by a crew member on the same date.

*10.'islive' ensures that an entry is live. When a new entry is made in either on duty or off duty or trainee , it automatically marks other live records of the corresponding crew as unlive. This maintains data integrity and promotes efficiency in the database (and implemented by triggers on these tables).

ENTITY RELATIONSHIP MODEL:



RELATIONAL SCHEMA:



FUNCTIONAL DEPENDENCIES AND NORMALIZATION:

CREW(CREW_ID, TRACTION,EMP_NO,LI_ID,FIRST_NAME,LAST_NAME,CREW_TYPE,HQ)

CREW_ID -> TRACTION

CREW_ID -> EMP_NO

CREW_ID -> LI_ID

CREW_ID -> FIRST_NAME

CREW_ID -> LAST_NAME

CREW_ID -> CREW_TYPE

EMP_NO -> CREW_ID

LI_ID -> HQ

CREW_ID -> HQ (redundant FD)

CANDIDATE KEYS: CREW_ID, EMP_NO

This relation is in 1NF as there are no multivalued attributes.

This relation is in 2NF as there are no partial dependencies (as candidate keys are single attributes only).

LI_ID -> HQ (This transitive dependency violates 3NF criteria)

So, decomposing this relation into

1. **CREW**

2. **HEADQUARTERS**

CREW(CREW_ID, TRACTION,EMP_NO,LI_ID,FIRST_NAME,LAST_NAME,CREW_TYPE)

CREW_ID -> TRACTION

CREW_ID -> EMP_NO

CREW_ID -> LI_ID

CREW_ID -> FIRST_NAME

CREW_ID -> LAST_NAME

CREW_ID -> CREW_TYPE

EMP_NO -> CREW_ID

CANDIDATE KEYS: CREW_ID, EMP_NO

This relation is now free from transitive dependencies.

As all the determinants (i.e., on the left hand side of the functional dependency) in the FDs are keys (CREW_ID , EMP_NO) , the relation is also in BCNF.

HEADQUARTERS(LI_ID,HQ)

LI_ID -> HQ

CANDIDATE KEYS : LI_ID

This is in BCNF as this is a two-attribute relation!

CREWDATA(CREW_ID,CREW_NAME,GENDER,DOB,HIRE_DATE,ADDRESS)

CREW_ID -> CREW_NAME

CREW_ID -> GENDER

CREW_ID -> DOB

CREW_ID -> HIRE_DATE

CREW_ID -> ADDRESS

CANDIDATE KEY : CREW_ID

As all the determinants in the FDs are key (CREW_ID) , the relation's highest normal form is BCNF.

MOBILE_NOS(MOBILE_NO,CREW_ID)

MOBILE_NO -> CREW_ID

CANDIDATE KEY : MOBILE_NO

This is in BCNF as this is a two-attribute relation!

MEDICAL(CREW_ID,MSTANDARD,STATUS,DUE DATE)

CREW_ID -> MSTANDARD

CREW_ID -> DUE DATE

CANDIDATE KEY : CREW_ID

As all the determinants in the FDs are key (CREW_ID), the relation's highest normal form is BCNF.

DEPENDENTS(CREW_ID,D_NAME,RELATION,DOB)

CREW_ID D_NAME -> RELATION

CREW_ID D_NAME -> DOB

CANDIDATE KEY : (CREW_ID D_NAME)

As all the determinants in the FDs are key (CREW_ID D_NAME), the relation's highest normal form is BCNF.

STATUS(CREW_ID,AVAIL_AT)

CREW_ID -> AVAIL_AT

CANDIDATE KEY : CREW_ID

This is in BCNF as this is a two-attribute relation!

ONDUTY(CREW_ID,SIGNON,LOCO_NO,TRAIN_NO,AVAIL_AT,ISLIVE,ROUTE_ID)

CREW_ID SIGNON -> LOCO_NO

CREW_ID SIGNON -> TRAIN_NO

CREW_ID SIGNON -> AVAIL_AT

CREW_ID SIGNON -> ISLIVE

CREW_ID SIGNON -> ROUTE_ID (redundant FD)

TRAIN_NO -> ROUTE_ID

CANDIDATE KEYS : (CREW_ID SIGNON)

This relation is in 1NF as there are no multivalued attributes.

This relation is in 2NF as there are no partial dependencies , where CREW_ID alone or SIGNON alone can determine one or more attributes.

TRAIN_NO -> ROUTE_ID

This is the only transitive dependency violating 3NF, so decomposing this relation into :

1. **ONDUTY**

2. **TRAIN_INFO**

ONDUTY(CREW_ID, SIGNON, LOCO_NO, TRAIN_NO, AVAIL_AT, ISLIVE)

CREW_ID SIGNON -> LOCO_NO

CREW_ID SIGNON -> TRAIN_NO

CREW_ID SIGNON -> AVAIL_AT

CREW_ID SIGNON -> ISLIVE

CANDIDATE KEY: (CREW_ID SIGNON)

As all the determinants in the FDs are key (CREW_ID SIGNON), the relation's highest normal form is BCNF.

TRAIN_INFO(TRAIN_NO, ROUTE_ID)

TRAIN_NO -> ROUTE_ID

CANDIDATE KEY : TRAIN_NO

This is in BCNF as this is a two-attribute relation!

OFFDUTY(CREW_ID, LAST_SIGNOFF, AVAILABLE, AVAIL_AT, ISLIVE)

CREW_ID LAST_SIGNOFF -> AVAILABLE

CREW_ID LAST_SIGNOFF -> AVAIL_AT

CREW_ID LAST_SIGNOFF -> ISLIVE

CANDIDATE KEY: (CREW_ID LAST_SIGNOFF)

As all the determinants in the FDs are key (CREW_ID LAST_SIGNOFF), the relation's highest normal form is BCNF.

TRAINEE(CREW_ID, AVAIL_AT, TRAINING_ID)

CREW_ID -> AVAIL_AT

CREW_ID -> TRAINING_ID

CANDIDATE KEY : CREW_ID

As all the determinants in the FDs are key (CREW_ID), the relation's highest normal form is BCNF.

INSTRUCTOR(INSTRUCTOR_ID, INSTRUCTORNAME, TRAINING_ID)

INSTRUCTOR_ID -> INSTRUCTORNAME

INSTRUCTOR_ID -> TRAINING_ID

CANDIDATE KEY : INSTRUCTOR_ID

As all the determinants in the FDs are key (INSTRUCTOR_ID), the relation's highest normal form is BCNF.

TRAINING(TRAINING_ID, TRAINING_NAME, LOC, TDURATION)

TRAINING_ID -> TRAINING_NAME

TRAINING_ID -> LOC

TRAINING_ID -> TDURATION

CANDIDATE KEY : TRAINING_ID

As all the determinants in the FDs are key (TRAINING_ID), the relation's highest normal form is BCNF.

PREVIOUS_TRAINING(CREW_ID, CDATE, TRAINING_ID)

CREW_ID CDATE -> TRAINING_ID

CANDIDATE KEY : (CREW_ID CDATE)

As all the determinants in the FDs are key (CREW_ID CDATE), the relation's highest normal form is BCNF.

ROUTE_DETAILS(ROUTE_ID, FROM, TO, ACTUAL_KMS)

ROUTE_ID -> FROM

ROUTE_ID -> TO

ROUTE_ID -> ACTUAL_KMS

FROM TO -> ROUTE_ID

CANDIDATE KEY : (ROUTE_ID , FROM TO)

As all the determinants in the FDs are key (ROUTE_ID , FROM TO), the relation's highest normal form is BCNF.

FORTNIGHT_DETAILS(FORTNIGHT_BEGIN, CREW_ID, HQ_REST, OVERTIME, KMS, NIGHT_HRS, OUTSTATION_REST)

FORTNIGHT_BEGIN CREW_ID -> HQ_REST

FORTNIGHT_BEGIN CREW_ID -> OVERTIME

FORTNIGHT_BEGIN CREW_ID -> KMS

FORTNIGHT_BEGIN CREW_ID -> NIGHT_HRS

FORTNIGHT_BEGIN CREW_ID -> OUTSTATION HRS

FORTNIGHT_BEGIN CREW_ID -> _REST

CANDIDATE KEY : (FORTNIGHT_BEGIN CREW_ID)

As all the determinants in the FDs are key (FORTNIGHT_BEGIN CREW_ID), the relation's highest normal form is BCNF.

TABLES:

HEADQUARTERS

Name	Null?	Type

LI_ID	NOT NULL	VARCHAR2(8)
HQ	NOT NULL	VARCHAR2(4)

CREW

Name	Null?	Type

CREW_ID	NOT NULL	VARCHAR2(8)
EMP_NO	NOT NULL	NUMBER(38)
FIRST_NAME	NOT NULL	VARCHAR2(15)
LAST_NAME	NOT NULL	VARCHAR2(15)
TRACTION	NOT NULL	VARCHAR2(15)
CREW_TYPE	NOT NULL	VARCHAR2(6)
LI_ID	NOT NULL	VARCHAR2(8)

MOBILE_NOS

Name	Null?	Type

CREW_ID	NOT NULL	VARCHAR2(8)
MOBILE_NO	NOT NULL	CHAR(10)

CREW_DATA

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
GENDER	NOT NULL	VARCHAR2(6)
DOB		DATE
HIRE_DATE	NOT NULL	DATE
ADDRESS		VARCHAR2(38)

DEPENDENTS

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
D_NAME	NOT NULL	VARCHAR2(15)
RELATION	NOT NULL	VARCHAR2(10)
DOB		DATE

STATUS

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
AVAIL_AT		VARCHAR2(5)

ROUTE_DETAILS

Name	Null?	Type
ROUTE_ID	NOT NULL	NUMBER(38)
FROM_STATION	NOT NULL	VARCHAR2(4)
TO_STATION	NOT NULL	VARCHAR2(4)
ACTUAL_KMS	NOT NULL	NUMBER

TRAIN_INFO

Name	Null?	Type
TRAIN_NO	NOT NULL	NUMBER(38)
ROUTEID	NOT NULL	NUMBER(38)

TRAINING

Name	Null?	Type
TRAINING_ID	NOT NULL	NUMBER(38)
TRAINING_NAME		VARCHAR2(20)
LOC	NOT NULL	VARCHAR2(4)
TDURATION		NUMBER(38)

MEDICAL

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
MSTANDARD		CHAR(1)
STATUS		VARCHAR2(5)
DUEDATE		DATE

PREVIOUS_TRAINING

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
CDATE	NOT NULL	DATE
TRAINING_ID	NOT NULL	NUMBER(38)

ONDUTY

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
SIGNON	NOT NULL	TIMESTAMP(6)
LOCO_NO	NOT NULL	NUMBER(38)
TRAIN_NO	NOT NULL	NUMBER(38)
AVAIL_AT		VARCHAR2(4)
ISLIVE		CHAR(1)

OFFDUTY

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
LAST_SIGNOFF	NOT NULL	TIMESTAMP(6)
AVAILABLE		TIMESTAMP(6)
AVAIL_AT	NOT NULL	VARCHAR2(4)
ISLIVE		CHAR(1)

TRAINEE

Name	Null?	Type
CREW_ID	NOT NULL	VARCHAR2(8)
AVAIL_AT		VARCHAR2(4)
TRAINING_ID	NOT NULL	NUMBER

INSTRUCTOR

Name	Null?	Type
INSTRUCTOR_ID	NOT NULL	NUMBER
INSTRUCTORNAME	NOT NULL	VARCHAR2(15)
TRAINING_ID	NOT NULL	NUMBER(38)

FORTNIGHT_DETAILS

Name	Null?	Type
FORTNIGHT_BEGIN	NOT NULL	DATE
CREW_ID	NOT NULL	VARCHAR2(8)
OVERTIME		NUMBER
KMS		NUMBER
NIGHT_HRS		NUMBER
HQ_REST		NUMBER
OUTSTATION_REST		NUMBER

CREATING TABLES, TRIGGERS, AND INSERTING VALUES:

HEADQUARTERS:

```
CREATE TABLE HEADQUARTERS(
  LI_ID VARCHAR(8) PRIMARY KEY,
  HQ VARCHAR(4) NOT NULL
);

INSERT INTO HEADQUARTERS VALUES('KZJ3241','KZJ');
INSERT INTO HEADQUARTERS VALUES('DKJ6123','DKJ');
INSERT INTO HEADQUARTERS VALUES('SC1367','SC');
INSERT INTO HEADQUARTERS VALUES('BPQ1573','BPQ');
```

```

INSERT INTO HEADQUARTERS VALUES('BZA7341','BZA');
INSERT INTO HEADQUARTERS VALUES('BDCR9787','BDCR');
INSERT INTO HEADQUARTERS VALUES('KZJ5676','KZJ');
INSERT INTO HEADQUARTERS VALUES('DKJ6565','DKJ');
INSERT INTO HEADQUARTERS VALUES('ZN1928','ZN');
INSERT INTO HEADQUARTERS VALUES('BZA7432','BZA');
INSERT INTO HEADQUARTERS VALUES('BDCR5999','BDCR');
INSERT INTO HEADQUARTERS VALUES('DKJ6261','DKJ');

```

```
SELECT * FROM HEADQUARTERS;
```

	LI_ID	HQ
1	KZJ3241	KZJ
2	DKJ6123	DKJ
3	SC1367	SC
4	BPQ1573	BPQ
5	BZA7341	BZA
6	BDCR9787	BDCR
7	KZJ5676	KZJ
8	DKJ6565	DKJ
9	ZN1928	ZN
10	BZA7432	BZA
11	BDCR5999	BDCR
12	DKJ6261	DKJ

CREW:

```

CREATE TABLE CREW(
CREW_ID VARCHAR(8),
EMP_NO INTEGER NOT NULL CONSTRAINT CHECK_EMPNO CHECK (EMP_NO BETWEEN 100000000
AND 999999999),
FIRST_NAME VARCHAR(15) NOT NULL ,
LAST_NAME VARCHAR(15) NOT NULL ,
TRACTION VARCHAR(15) NOT NULL ,
CREW_TYPE VARCHAR(6) NOT NULL,
LI_ID VARCHAR(8) NOT NULL,
PRIMARY KEY(CREW_ID),

```



```

FOREIGN KEY(LI_ID) REFERENCES HEADQUARTERS,
CONSTRAINT UNIQUE_EMP_NO UNIQUE(EMP_NO)
);

INSERT INTO CREW VALUES('KZJ1224',123454321,'ARJUN','DESAI','ELEC','LPG','KZJ3241');
INSERT INTO CREW VALUES('DKJ1234',123456789,'RAKESH','PONNALA','DISL','LPG','DKJ6123');
INSERT INTO CREW VALUES('SC2345',246813579,'SAHIL','KANTAM','ELEC','ALP','SC1367');
INSERT INTO CREW VALUES('BPQ3456',135792468,'SANHTOSH','BEEMOJU','DUAL','LPM','BPQ1573');
INSERT INTO CREW VALUES('BZA4567',357912468,'ANJALI','ADIVI','ELEC','LPG','BZA7341');
INSERT INTO CREW VALUES('BDCR5678',579132468,'PREETHAM','KONDRA','ELEC','LPG','BDCR9787');
INSERT INTO CREW VALUES('SC6789',132465798,'GOPI','GANTA','DUAL','LPP','SC1367');
INSERT INTO CREW VALUES('KZJ7891',987654321,'VEDHIKA','MUSIPATLA','DISL','LPM','KZJ5676');
INSERT INTO CREW VALUES('DKJ8912',876549321,'KIRAN','POBBATHI','ELEC','LPG','DKJ6565');
INSERT INTO CREW VALUES('KZJ9124',453267891,'RAMESH','CHALLA','DUAL','LPP','KZJ3241');
INSERT INTO CREW VALUES('ZN1357',864209351,'SHESHU','VELAGANDULA','ELEC','ALG','ZN1928');
INSERT INTO CREW VALUES('BZA7522',192837465,'RAHUL','VUPPALA','ELEC','LPP','BZA7432');
INSERT INTO CREW VALUES('BDCR5888',597321475,'NIKHIL','GANLA','DUAL','LPG','BDCR5999');

```

```
SELECT * FROM CREW;
```

	CREW_ID	EMP_NO	FIRST_NAME	LAST_NAME	TRACTION	CREW_TYPE	LI_ID
1	KZJ1224	123454321	ARJUN	DESAI	ELEC	LPG	KZJ3241
2	DKJ1234	123456789	RAKESH	PONNALA	DISL	LPG	DKJ6123
3	SC2345	246813579	SAHIL	KANTAM	ELEC	ALP	SC1367
4	BPQ3456	135792468	SANHTOSH	BEEMOJU	DUAL	LPM	BPQ1573
5	BZA4567	357912468	ANJALI	ADIVI	ELEC	LPG	BZA7341
6	BDCR5678	579132468	PREETHAM	KONDRA	ELEC	LPG	BDCR9787
7	SC6789	132465798	GOPI	GANTA	DUAL	LPP	SC1367
8	KZJ7891	987654321	VEDHIKA	MUSIPATLA	DISL	LPM	KZJ5676
9	DKJ8912	876549321	KIRAN	POBBATHI	ELEC	LPG	DKJ6565
10	KZJ9124	453267891	RAMESH	CHALLA	DUAL	LPP	KZJ3241
11	ZN1357	864209351	SHESHU	VELAGANDULA	ELEC	ALG	ZN1928
12	BZA7522	192837465	RAHUL	VUPPALA	ELEC	LPP	BZA7432
13	BDCR5888	597321475	NIKHIL	GANLA	DUAL	LPG	BDCR5999

MOBILE NOS:

```
CREATE TABLE MOBILE_NOS(
```

```
CREW_ID VARCHAR(8) NOT NULL,  
MOBILE_NO CHAR(10),  
PRIMARY KEY(MOBILE_NO),  
FOREIGN KEY(CREW_ID) REFERENCES CREW  
);  
  
INSERT INTO MOBILE_NOS VALUES('KZJ1224','8499082173');  
INSERT INTO MOBILE_NOS VALUES('KZJ1224','9347840236');  
INSERT INTO MOBILE_NOS VALUES('DKJ1234','9310567458');  
INSERT INTO MOBILE_NOS VALUES('SC2345','8332969360');  
INSERT INTO MOBILE_NOS VALUES('SC2345','9448709123');  
INSERT INTO MOBILE_NOS VALUES('BPQ3456','9701847673');  
INSERT INTO MOBILE_NOS VALUES('BZA4567','9493122103');  
INSERT INTO MOBILE_NOS VALUES('BDCR5678','9390154503');  
INSERT INTO MOBILE_NOS VALUES('BDCR5678','9274655231');  
INSERT INTO MOBILE_NOS VALUES('SC6789','9400738411');  
INSERT INTO MOBILE_NOS VALUES('KZJ7891','8074552593');  
INSERT INTO MOBILE_NOS VALUES('DKJ8912','8106845615');  
INSERT INTO MOBILE_NOS VALUES('DKJ8912','7190900213');  
INSERT INTO MOBILE_NOS VALUES('KZJ9124','9848654686');  
INSERT INTO MOBILE_NOS VALUES('ZN1357','7984232015');  
INSERT INTO MOBILE_NOS VALUES('ZN1357','9989980106');  
INSERT INTO MOBILE_NOS VALUES('BZA7522','8008276371');  
INSERT INTO MOBILE_NOS VALUES('BDCR5888','9121242626');  
  
SELECT * FROM MOBILE_NOS;
```

	CREW_ID	MOBILE_NO
1	KZJ1224	8499082173
2	KZJ1224	9347840236
3	DKJ1234	9310567458
4	SC2345	8332969360
5	SC2345	9448709123
6	BPQ3456	9701847673
7	BZA4567	9493122103
8	BDCR5678	9390154503
9	BDCR5678	9274655231
10	SC6789	9400738411
11	KZJ7891	8074552593
12	DKJ8912	8106845615
13	DKJ8912	7190900213
14	KZJ9124	9848654686
15	ZN1357	7984232015
16	ZN1357	9989980106
17	BZA7522	8008276371
18	BDCR5888	9121242626

CREW DATA:

CREATE TABLE CREW_DATA(

CREW_ID PRIMARY KEY,

GENDER VARCHAR(6) NOT NULL,

DOB DATE,

HIRE_DATE DATE NOT NULL,

ADDRESS VARCHAR(38),

FOREIGN KEY(CREW_ID) REFERENCES CREW

);

INSERT INTO CREW_DATA VALUES('KZJ1224','M',TO_DATE('10-SEP-1979','DD-MM-YYYY'),TO_DATE('12-OCT-2001','DD-MM-YYYY'),'HN0.31-1-1234,SVS HOMES,HNK');

INSERT INTO CREW_DATA VALUES('DKJ1234','M',TO_DATE('1-DEC-1975','DD-MM-YYYY'),TO_DATE('22-JAN-2000','DD-MM-YYYY'),'HN0.12-2-1747,PARIMALA COLONY,TNK');

INSERT INTO CREW_DATA VALUES('SC2345','M',TO_DATE('21-OCT-1970','DD-MM-YYYY'),TO_DATE('15-AUG-1999','DD-MM-YYYY'),'HN0.21-3-3412,JAWAHAR COLONY,IGK');

INSERT INTO CREW_DATA VALUES('BPQ3456','M',TO_DATE('30-NOV-1978','DD-MM-YYYY'),TO_DATE('01-MAR-2001','DD-MM-YYYY'),'HN0.11-5-1111,ARTS COLLEGE,BPA');

INSERT INTO CREW_DATA VALUES('BZA4567','F',TO_DATE('7-JAN-1972','DD-MM-YYYY'),TO_DATE('21-JUN-1997','DD-MM-YYYY'),'HN0.31-4-4432,ADVOCATES,SUR');

```
INSERT INTO CREW_DATA VALUES('BDCR5678','M',TO_DATE('12-FEB-1976','DD-MM-YYYY'),TO_DATE('02-JUL-2003','DD-MM-YYYY'),'HN0.22-2-8989,TEACHERS,LPR');
```

```
INSERT INTO CREW_DATA VALUES('SC6789','M',TO_DATE('4-JUN-1973','DD-MM-YYYY'),TO_DATE('01-SEP-1998','DD-MM-YYYY'),'HN0.15-1-4521,JUBILEE HILLS,MTU');
```

```
INSERT INTO CREW_DATA VALUES('KZJ7891','F',TO_DATE('23-JULY-1976','DD-MM-YYYY'),TO_DATE('19-JAN-1999','DD-MM-YYYY'),'HN0.17-7-1666,BANJARA HILLS,WDO');
```

```
INSERT INTO CREW_DATA VALUES('DKJ8912','M',TO_DATE('15-SEP-1980','DD-MM-YYYY'),TO_DATE('17-APR-2004','DD-MM-YYYY'),'HN0.23-8-2234,KU,KLP');
```

```
INSERT INTO CREW_DATA VALUES('KZJ9124','M',TO_DATE('6-NOV-1987','DD-MM-YYYY'),TO_DATE('30-SEP-2007','DD-MM-YYYY'),'HN0.14-9-7865,VISHWA COLONY,WGL');
```

```
INSERT INTO CREW_DATA VALUES('ZN1357','M',TO_DATE('27-MAR-1975','DD-MM-YYYY'),TO_DATE('08-OCT-1998','DD-MM-YYYY'),'HN0.24-2-1290,SAINATH COLONY,KJU');
```

```
INSERT INTO CREW_DATA VALUES('BZA7522','M',TO_DATE('18-APR-1976','DD-MM-YYYY'),TO_DATE('16-JAN-2002','DD-MM-YYYY'),'HN0.31-1-8531,INDHU COLONY,RTY');
```

```
INSERT INTO CREW_DATA VALUES('BDCR5888','M',TO_DATE('26-JAN-1978','DD-MM-YYYY'),TO_DATE('12-FEB-2001','DD-MM-YYYY'),'HN0.24-5-9752,IRCTC,VJK');
```

```
SELECT * FROM CREW_DATA;
```

	CREW_ID	GENDER	DOB	HIRE_DATE	ADDRESS
1	KZJ1224	M	10-09-79	12-10-01	HN0.31-1-1234,SVS HOMES,HNK
2	DKJ1234	M	01-12-75	22-01-00	HN0.12-2-1747,PARIMALA COLONY,TNK
3	SC2345	M	21-10-70	15-08-99	HN0.21-3-3412,JAWAHAR COLONY,IGK
4	BPQ3456	M	30-11-78	01-03-01	HN0.11-5-1111,ARTS COLLEGE,BPA
5	BZA4567	F	07-01-72	21-06-97	HN0.31-4-4432,ADVOCATES,SUR
6	BDCR5678	M	12-02-76	02-07-03	HN0.22-2-8989,TEACHERS,LPR
7	SC6789	M	04-06-73	01-09-98	HN0.15-1-4521,JUBILEE HILLS,MTU
8	KZJ7891	F	23-07-76	19-01-99	HN0.17-7-1666,BANJARA HILLS,WDO
9	DKJ8912	M	15-09-80	17-04-04	HN0.23-8-2234,KU,KLP
10	KZJ9124	M	06-11-87	30-09-07	HN0.14-9-7865,VISHWA COLONY,WGL
11	ZN1357	M	27-03-75	08-10-98	HN0.24-2-1290,SAINATH COLONY,KJU
12	BZA7522	M	18-04-76	16-01-02	HN0.31-1-8531,INDHU COLONY,RTY
13	BDCR5888	M	26-01-78	12-02-01	HN0.24-5-9752,IRCTC,VJK

DEPENDENTS:

```
CREATE TABLE DEPENDENTS(
```

```
CREW_ID VARCHAR(8),
```

```
D_NAME VARCHAR(15),
```

```
RELATION VARCHAR(10) NOT NULL,  
DOB DATE,  
PRIMARY KEY(CREW_ID,D_NAME),  
FOREIGN KEY(CREW_ID) REFERENCES CREW  
);  
  
INSERT INTO DEPENDENTS VALUES('KZJ1224','SWATHI','WIFE',TO_DATE('07-JAN-1982'));  
INSERT INTO DEPENDENTS VALUES('KZJ1224','SHERYL','DAUGHTER',TO_DATE('01-MAY-2004'));  
INSERT INTO DEPENDENTS VALUES('DKJ1234','KEERTHI','WIFE',TO_DATE('16-FEB-1980'));  
INSERT INTO DEPENDENTS VALUES('DKJ1234','THOMAS','SON',TO_DATE('05-MAR-2003'));  
INSERT INTO DEPENDENTS VALUES('SC2345','SWETHA','WIFE',TO_DATE('10-JUN-1975'));  
INSERT INTO DEPENDENTS VALUES('BPQ3456','MARTHAMMA','MOTHER',TO_DATE('14-JUL-1945'));  
INSERT INTO DEPENDENTS VALUES('BPQ3456','ARUNA','WIFE',TO_DATE('01-AUG-1983'));  
INSERT INTO DEPENDENTS VALUES('BPQ3456','MONA','DAUGHER',TO_DATE('15-SEP-1999'));  
INSERT INTO DEPENDENTS VALUES('BDCR5678','RADHA','WIFE',TO_DATE('31-OCT-1980'));  
INSERT INTO DEPENDENTS VALUES('BDCR5678','SANJAY','SON',TO_DATE('17-NOV-2004'));  
INSERT INTO DEPENDENTS VALUES('SC6789','ROOPA','MOTHER',TO_DATE('25-DEC-1943'));  
INSERT INTO DEPENDENTS VALUES('SC6789','RADHIKA','WIFE',TO_DATE('10-JAN-1975'));  
INSERT INTO DEPENDENTS VALUES('SC6789','VARSHA','DAUGHTER',TO_DATE('14-FEB-1997'));  
INSERT INTO DEPENDENTS VALUES('SC6789','ROHAN','SON',TO_DATE('12-MAR-1999'));  
INSERT INTO DEPENDENTS VALUES('DKJ8912','RANJANI','WIFE',TO_DATE('09-APR-1985'));  
INSERT INTO DEPENDENTS VALUES('ZN1357','DEEPA','WIFE',TO_DATE('21-OCT-1984'));  
INSERT INTO DEPENDENTS VALUES('ZN1357','ROHITH','SON',TO_DATE('06-MAY-2005'));  
INSERT INTO DEPENDENTS VALUES('BZA7522','MANJU','WIFE',TO_DATE('20-JUN-1981'));  
INSERT INTO DEPENDENTS VALUES('BZA7522','POCHAMMA','MOTHER',TO_DATE('13-JUL-1947'));  
INSERT INTO DEPENDENTS VALUES('BDCR5888','JAYA','WIFE',TO_DATE('22-DEC-1979'));  
INSERT INTO DEPENDENTS VALUES('BDCR5888','RAVI','SON',TO_DATE('01-OCT-2002'));  
INSERT INTO DEPENDENTS VALUES('BDCR5888','LAXMI','MOTHER',TO_DATE('12-FEB-1950'));  
  
SELECT * FROM DEPENDENTS;
```

	CREW_ID	D_NAME	RELATION	DOB
1	KZJ1224	SWATHI	WIFE	07-01-82
2	KZJ1224	SHERYL	DAUGHTER	01-05-04
3	DKJ1234	KEERTHI	WIFE	16-02-80
4	DKJ1234	THOMAS	SON	05-03-03
5	SC2345	SWETHA	WIFE	10-06-75
6	BPQ3456	MARTHAMMA	MOTHER	14-07-45
7	BPQ3456	ARUNA	WIFE	01-08-83
8	BPQ3456	MONA	DAUGHER	15-09-99
9	BDCR5678	RADHA	WIFE	31-10-80
10	BDCR5678	SANJAY	SON	17-11-04
11	SC6789	ROOPA	MOTHER	25-12-43
12	SC6789	RADHIKA	WIFE	10-01-75
13	SC6789	VARSHA	DAUGHTER	14-02-97
14	SC6789	ROHAN	SON	12-03-99
15	DKJ8912	RANJANI	WIFE	09-04-85
16	ZN1357	DEEPA	WIFE	21-10-84
17	ZN1357	ROHITH	SON	06-05-05
18	BZA7522	MANJU	WIFE	20-06-81
19	BZA7522	POCHAMMA	MOTHER	13-07-47
20	BDCR5888	JAYA	WIFE	22-12-79
21	BDCR5888	RAVI	SON	01-10-02
22	BDCR5888	LAXMI	MOTHER	12-02-50

STATUS:

```

CREATE TABLE STATUS(
CREW_ID VARCHAR(8) PRIMARY KEY,
AVAIL_AT VARCHAR(5),
FOREIGN KEY(CREW_ID) REFERENCES CREW
);

INSERT INTO STATUS VALUES('KZJ1224',NULL);
INSERT INTO STATUS VALUES('DKJ1234',NULL);
INSERT INTO STATUS VALUES('SC2345',NULL);
INSERT INTO STATUS VALUES('BPQ3456',NULL);
INSERT INTO STATUS VALUES('BZA4567',NULL);
INSERT INTO STATUS VALUES('BDCR5678',NULL);
INSERT INTO STATUS VALUES('SC6789',NULL);
INSERT INTO STATUS VALUES('KZJ7891',NULL);

```

```

INSERT INTO STATUS VALUES('DKJ8912',NULL);

INSERT INTO STATUS VALUES('KZJ9124',NULL);

INSERT INTO STATUS VALUES('ZN1357',NULL);

INSERT INTO STATUS VALUES('BZA7522',NULL);

INSERT INTO STATUS VALUES('BDCR5888',NULL);

```

```
SELECT * FROM STATUS;
```

	CREW_ID	AVAIL_AT
1	KZJ1224	(null)
2	DKJ1234	(null)
3	SC2345	(null)
4	BPQ3456	(null)
5	BZA4567	(null)
6	BDCR5678	(null)
7	SC6789	(null)
8	KZJ7891	(null)
9	DKJ8912	(null)
10	KZJ9124	(null)
11	ZN1357	(null)
12	BZA7522	(null)
13	BDCR5888	(null)

(Table will be updated later with insertions on on duty and off duty and trainee using triggers)

ROUTE DETAILS:

```

CREATE TABLE ROUTE_DETAILS(

ROUTE_ID INTEGER NOT NULL CONSTRAINT CHECK_ROUTEID CHECK(ROUTE_ID BETWEEN 10000
AND 99999),

FROM_STATION VARCHAR(4) NOT NULL,

TO_STATION VARCHAR(4) NOT NULL,

ACTUAL_KMS NUMBER NOT NULL,

PRIMARY KEY(ROUTE_ID)

);

INSERT INTO ROUTE_DETAILS VALUES(12345,'KZJ','BDCR',150);

INSERT INTO ROUTE_DETAILS VALUES(75894,'SC','KZJ',136);

INSERT INTO ROUTE_DETAILS VALUES(69532,'DKJ','NSL',200);

INSERT INTO ROUTE_DETAILS VALUES(72088,'KZJ','ZN',100);

```



```

INSERT INTO ROUTE_DETAILS VALUES(61238,'BZA','BDCR',210);
INSERT INTO ROUTE_DETAILS VALUES(90821,'SC','BPQ',150);
INSERT INTO ROUTE_DETAILS VALUES(23415,'KRMR','KZJ',90);
INSERT INTO ROUTE_DETAILS VALUES(19532,'KZJ','BZA',180);
INSERT INTO ROUTE_DETAILS VALUES(43257,'GNP','ZN',70);
INSERT INTO ROUTE_DETAILS VALUES(58321,'KZJ','NSL',170);
INSERT INTO ROUTE_DETAILS VALUES(54321,'BDCR','KZJ',150);
INSERT INTO ROUTE_DETAILS VALUES(49857,'KZJ','SC',136);
INSERT INTO ROUTE_DETAILS VALUES(23596,'NSL','DKJ',200);
INSERT INTO ROUTE_DETAILS VALUES(83216,'BDCR','BZA',210);
INSERT INTO ROUTE_DETAILS VALUES(12809,'BPQ','SC',150);
INSERT INTO ROUTE_DETAILS VALUES(51432,'KZJ','KRMR',90);
INSERT INTO ROUTE_DETAILS VALUES(23591,'BZA','KZJ',180);
INSERT INTO ROUTE_DETAILS VALUES(75234,'ZN','GNP',70);
INSERT INTO ROUTE_DETAILS VALUES(12385,'NSL','KZJ',170);

```

```

SELECT * FROM ROUTE_DETAILS;

```

	ROUTE_ID	FROM_STATION	TO_STATION	ACTUAL_KMS
1	12345	KZJ	BDCR	150
2	75894	SC	KZJ	136
3	69532	DKJ	NSL	200
4	72088	KZJ	ZN	100
5	61238	BZA	BDCR	210
6	90821	SC	BPQ	150
7	23415	KRMR	KZJ	90
8	19532	KZJ	BZA	180
9	43257	GNP	ZN	70
10	58321	KZJ	NSL	170
11	54321	BDCR	KZJ	150
12	49857	KZJ	SC	136
13	23596	NSL	DKJ	200
14	83216	BDCR	BZA	210
15	12809	BPQ	SC	150
16	51432	KZJ	KRMR	90
17	23591	BZA	KZJ	180
18	75234	ZN	GNP	70
19	12385	NSL	KZJ	170

TRAIN INFO:

```
CREATE TABLE TRAIN_INFO(  
    TRAIN_NO INTEGER NOT NULL CONSTRAINT CHECK_TRAIN_NO CHECK(TRAIN_NO BETWEEN 10000  
    AND 99999),  
    ROUTEID INTEGER NOT NULL,  
    PRIMARY KEY(TRAIN_NO),  
    FOREIGN KEY(ROUTEID) REFERENCES ROUTE_DETAILS  
);  
  
INSERT INTO TRAIN_INFO VALUES(12754,12345);  
INSERT INTO TRAIN_INFO VALUES(17011,75894);  
INSERT INTO TRAIN_INFO VALUES(17206,69532);  
INSERT INTO TRAIN_INFO VALUES(12722,72088);  
INSERT INTO TRAIN_INFO VALUES(67245,61238);  
INSERT INTO TRAIN_INFO VALUES(12721,90821);  
INSERT INTO TRAIN_INFO VALUES(12762,23415);  
INSERT INTO TRAIN_INFO VALUES(12706,19532);  
INSERT INTO TRAIN_INFO VALUES(17234,75894);  
INSERT INTO TRAIN_INFO VALUES(17208,69532);  
INSERT INTO TRAIN_INFO VALUES(19777,43257);  
INSERT INTO TRAIN_INFO VALUES(18777,58321);  
INSERT INTO TRAIN_INFO VALUES(16555,54321);  
INSERT INTO TRAIN_INFO VALUES(12888,49857);  
INSERT INTO TRAIN_INFO VALUES(43255,23596);  
INSERT INTO TRAIN_INFO VALUES(17891,83216);  
INSERT INTO TRAIN_INFO VALUES(77777,12809);  
INSERT INTO TRAIN_INFO VALUES(10007,51432);  
INSERT INTO TRAIN_INFO VALUES(19324,23591);  
INSERT INTO TRAIN_INFO VALUES(90008,75234);  
INSERT INTO TRAIN_INFO VALUES(64821,12385);  
  
SELECT * FROM TRAIN_INFO;
```

	TRAIN_NO	ROUTEID
1	12754	12345
2	17011	75894
3	17206	69532
4	12722	72088
5	67245	61238
6	12721	90821
7	12762	23415
8	12706	19532
9	17234	75894
10	17208	69532
11	19777	43257
12	18777	58321
13	16555	54321
14	12888	49857
15	43255	23596
16	17891	83216
17	77777	12809
18	10007	51432
19	19324	23591
20	90008	75234
21	64821	12385

TRAINING:

CREATE TABLE TRAINING(

TRAINING_ID INTEGER CONSTRAINT CHECK_TRAININGID CHECK(TRAINING_ID BETWEEN 100 AND 999),

TRAINING_NAME VARCHAR(20),

LOC VARCHAR(4) NOT NULL,

TDURATION INTEGER,

PRIMARY KEY(TRAINING_ID)

);

INSERT INTO TRAINING VALUES(572,'RFSH','KZJ',15);

INSERT INTO TRAINING VALUES(193,'LI','BZA',30);

INSERT INTO TRAINING VALUES(104,'LP','BPQ',14);

INSERT INTO TRAINING VALUES(689,'ALP','SC',20);

INSERT INTO TRAINING VALUES(123,'LPR','BDCR',15);

SELECT * FROM TRAINING;

	TRAINING_ID	TRAINING_NAME	LOC	TDURATION
1	572	RFSH	KZJ	15
2	193	LI	BZA	30
3	104	LP	BPQ	14
4	689	ALP	SC	20
5	123	LPR	BDCR	15

INSTRUCTOR:

CREATE TABLE INSTRUCTOR(

INSTRUCTOR_ID NUMBER CONSTRAINT CHECK_INSTR_ID CHECK(INSTRUCTOR_ID BETWEEN 1000 AND 9999),

INSTRUCTORNAME VARCHAR(15) NOT NULL,

TRAINING_ID INTEGER NOT NULL,

PRIMARY KEY(INSTRUCTOR_ID),

FOREIGN KEY(TRAINING_ID) REFERENCES TRAINING

);

INSERT INTO INSTRUCTOR VALUES(1111,'KANAKAIAH',572);

INSERT INTO INSTRUCTOR VALUES(1222,'SWAMY',572);

INSERT INTO INSTRUCTOR VALUES(1333,'ANIL',572);

INSERT INTO INSTRUCTOR VALUES(4444,'SAMPATHY',193);

INSERT INTO INSTRUCTOR VALUES(4555,'RAMESH',193);

INSERT INTO INSTRUCTOR VALUES(6611,'SRIKAR',104);

INSERT INTO INSTRUCTOR VALUES(7711,'ROHAN',689);

INSERT INTO INSTRUCTOR VALUES(8891,'ARJITH',123);

INSERT INTO INSTRUCTOR VALUES(8761,'SRINIVAS',123);

SELECT * FROM INSTRUCTOR;

	INSTRUCTOR_ID	INSTRUCTORNAME	TRAINING_ID
1	1111	KANAKAIAH	572
2	1222	SWAMY	572
3	1333	ANIL	572
4	4444	SAMPATHY	193
5	4555	RAMESH	193
6	6611	SRIKAR	104
7	7711	ROHAN	689
8	8891	ARJITH	123
9	8761	SRINIVAS	123

MEDICAL:

```

CREATE TABLE MEDICAL(
CREW_ID VARCHAR(8) PRIMARY KEY,
MSTANDARD CHAR(1),
STATUS VARCHAR(5),
DUE DATE DATE,
FOREIGN KEY(CREW_ID) REFERENCES CREW
);

INSERT INTO MEDICAL VALUES('KZJ1224','A','FIT',TO_DATE('16/01/2024', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('DKJ1234','B','FIT',TO_DATE('01/12/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('SC2345','B','FIT',TO_DATE('06/04/2024', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('BPQ3456','A','FIT',TO_DATE('11/09/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('BZA4567','A','FIT',TO_DATE('07/11/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('BDCR5678','A','FIT',TO_DATE('02/08/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('SC6789','B','FIT',TO_DATE('03/02/2024', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('KZJ7891','B','FIT',TO_DATE('12/06/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('DKJ8912','A','FIT',TO_DATE('21/08/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('KZJ9124','B','FIT',TO_DATE('21/08/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('ZN1357','A','FIT',TO_DATE('23/01/2024', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('BZA7522','B','FIT',TO_DATE('17/06/2023', 'DD/MM/YYYY'));
INSERT INTO MEDICAL VALUES('BDCR5888','A','FIT',TO_DATE('16/03/2024', 'DD/MM/YYYY'));

```

SELECT * FROM MEDICAL;

	CREW_ID	MSTANDARD	STATUS	DUEDATE
1	KZJ1224	A	FIT	16-01-24
2	DKJ1234	B	FIT	01-12-23
3	SC2345	B	FIT	06-04-24
4	BPQ3456	A	FIT	11-09-23
5	BZA4567	A	FIT	07-11-23
6	BDCR5678	A	FIT	02-08-23
7	SC6789	B	FIT	03-02-24
8	KZJ7891	B	FIT	12-06-23
9	DKJ8912	A	FIT	21-08-23
10	KZJ9124	B	FIT	21-08-23
11	ZN1357	A	FIT	23-01-24
12	BZA7522	B	FIT	17-06-23
13	BDCR5888	A	FIT	16-03-24

PREVIOUS TRAINING:

CREATE TABLE PREVIOUS_TRAINING(

CREW_ID VARCHAR(8),

CDATE DATE,

TRAINING_ID INTEGER NOT NULL,

PRIMARY KEY(CREW_ID,CDATE),

FOREIGN KEY(CREW_ID) REFERENCES CREW,

FOREIGN KEY(TRAINING_ID) REFERENCES TRAINING

);

INSERT INTO PREVIOUS_TRAINING VALUES('KZJ1224',TO_DATE('10-SEP-2022','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('DKJ1234',TO_DATE('1-DEC-2022','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('SC2345',TO_DATE('21-OCT-2022','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('BPQ3456',TO_DATE('30-NOV-2022','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('BZA4567',TO_DATE('7-JAN-2023','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('BDCR5678',TO_DATE('12-FEB-2023','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('SC6789',TO_DATE('4-JUN-2022','DD-MM-YYYY'),572);

INSERT INTO PREVIOUS_TRAINING VALUES('KZJ7891',TO_DATE('23-MAR-2023','DD-MM-YYYY'),572);

```

INSERT INTO PREVIOUS_TRAINING VALUES('DKJ8912',TO_DATE('15-SEP-2022','DD-MM-YYYY'),572);
INSERT INTO PREVIOUS_TRAINING VALUES('KZJ9124',TO_DATE('6-DEC-2022','DD-MM-YYYY'),572);
INSERT INTO PREVIOUS_TRAINING VALUES('ZN1357',TO_DATE('27-MAR-2022','DD-MM-YYYY'),572);
INSERT INTO PREVIOUS_TRAINING VALUES('BZA7522',TO_DATE('18-APR-2022','DD-MM-YYYY'),572);
INSERT INTO PREVIOUS_TRAINING VALUES('BDCR5888',TO_DATE('26-JAN-2023','DD-MM-YYYY'),572);

```

```

SELECT * FROM PREVIOUS_TRAINING;

```

	CREW_ID	CDATE	TRAINING_ID
1	KZJ1224	10-09-22	572
2	DKJ1234	01-12-22	572
3	SC2345	21-10-22	572
4	BPQ3456	30-11-22	572
5	BZA4567	07-01-23	572
6	BDCR5678	12-02-23	572
7	SC6789	04-06-22	572
8	KZJ7891	23-03-23	572
9	DKJ8912	15-09-22	572
10	KZJ9124	06-12-22	572
11	ZN1357	27-03-22	572
12	BZA7522	18-04-22	572
13	BDCR5888	26-01-23	572

[ONDUTY:](#)

```

CREATE TABLE ONDUTY(
CREW_ID VARCHAR(8),
SIGNON TIMESTAMP NOT NULL,
LOCO_NO INTEGER NOT NULL CONSTRAINT CHECK_LOCONO CHECK(LOCO_NO BETWEEN 10000
AND 99999),
TRAIN_NO INTEGER NOT NULL,
AVAIL_AT VARCHAR(4),
ISLIVE CHAR(1) DEFAULT 'Y',
PRIMARY KEY(CREW_ID,SIGNON),
FOREIGN KEY(CREW_ID) REFERENCES STATUS,
FOREIGN KEY(TRAIN_NO) REFERENCES TRAIN_INFO
);

```

```
SELECT * FROM ONDUTY;
```

↕ CREW_ID	↕ SIGNON	↕ LOCO_NO	↕ TRAIN_NO	↕ AVAIL_AT	↕ ISLIVE
-----------	----------	-----------	------------	------------	----------

(Insertions shown later)

OFFDUTY:

```
CREATE TABLE OFFDUTY(  
  CREW_ID VARCHAR(8),  
  LAST_SIGNOFF TIMESTAMP NOT NULL,  
  AVAILABLE TIMESTAMP,  
  AVAIL_AT VARCHAR(4) NOT NULL,  
  ISLIVE CHAR(1) DEFAULT 'Y',  
  PRIMARY KEY(CREW_ID, LAST_SIGNOFF),  
  FOREIGN KEY(CREW_ID) REFERENCES STATUS  
);
```

```
SELECT * FROM OFFDUTY;
```

↕ CREW_ID	↕ LAST_SIG...	↕ AVAILABLE	↕ AVAIL_AT	↕ ISLIVE
-----------	---------------	-------------	------------	----------

(Insertions shown later)

TRAINEE:

```
CREATE TABLE TRAINEE(  
  CREW_ID VARCHAR(8) PRIMARY KEY,  
  AVAIL_AT VARCHAR(4),  
  TRAINING_ID NUMBER NOT NULL,  
  FOREIGN KEY(CREW_ID) REFERENCES STATUS,  
  FOREIGN KEY(TRAINING_ID) REFERENCES TRAINING  
);  
  
SELECT * FROM TRAINEE;
```

CREW_ID	AVAIL_AT	TRAINING...
---------	----------	-------------

(Insertions shown later)

FORTNIGHT DETAILS:

```
CREATE TABLE FORTNIGHT_DETAILS(
FORTNIGHT_BEGIN DATE,
CREW_ID VARCHAR(8),
OVERTIME NUMBER,
KMS NUMBER,
NIGHT_HRS NUMBER,
HQ_REST NUMBER,
OUTSTATION_REST NUMBER,
PRIMARY KEY(FORTNIGHT_BEGIN,CREW_ID),
FOREIGN KEY(CREW_ID) REFERENCES CREW
);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'KZJ1224',2,131.2,4,15,3);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'DKJ1234',3,150,5,10,1);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'SC2345',NULL,190,2,5,4);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'BPQ3456',1,250,6,7,2);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'BZA4567',1,100,7,8,3);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'BDCR5678',4,450,1,12,6);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'SC6789',NULL,270,4,6,2);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'KZJ7891',2,132.5,2,5,7);

INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'DKJ8912',2,80.7,5,13,5);
```



```
INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'KZJ9124',1,170,1,16,1);
```

```
INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'ZN1357',3,270,3,9,3);
```

```
INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'BZA7522',2,100,2,4,2);
```

```
INSERT INTO FORTNIGHT_DETAILS VALUES(TO_DATE('16-APR-2023', 'DD-MM-YYYY'),'BDCR5888',3,184.5,9,7,2);
```

```
SELECT * FROM FORTNIGHT_DETAILS;
```

	🔗 FORTNIGHT_BEGIN	🔗 CREW_ID	🔗 OVERTIME	🔗 KMS	🔗 NIGHT_HRS	🔗 HQ_REST	🔗 OUTSTATION_REST
1	16-04-23	KZJ1224	2	131.2	4	15	3
2	16-04-23	DKJ1234	3	150	5	10	1
3	16-04-23	SC2345	(null)	190	2	5	4
4	16-04-23	BPQ3456	1	250	6	7	2
5	16-04-23	BZA4567	1	100	7	8	3
6	16-04-23	BDCR5678	4	450	1	12	6
7	16-04-23	SC6789	(null)	270	4	6	2
8	16-04-23	KZJ7891	2	132.5	2	5	7
9	16-04-23	DKJ8912	2	80.7	5	13	5
10	16-04-23	KZJ9124	1	170	1	16	1
11	16-04-23	ZN1357	3	270	3	9	3
12	16-04-23	BZA7522	2	100	2	4	2
13	16-04-23	BDCR5888	3	184.5	9	7	2

TRIGGERS:

PREV TRAIN EVAL:

```
CREATE OR REPLACE TRIGGER PREV_TRAIN_EVAL BEFORE INSERT ON PREVIOUS_TRAINING
```

```
FOR EACH ROW
```

```
BEGIN
```

```
DELETE FROM TRAINEE
```

```
WHERE CREW_ID=:NEW.CREW_ID;
```

```
END;
```

ONDUTY_EVAL:

```
CREATE OR REPLACE TRIGGER ONDUTY_EVAL BEFORE INSERT ON ONDUTY
FOR EACH ROW
DECLARE
S MEDICAL.STATUS%TYPE;
D PREVIOUS_TRAINING.CDATE%TYPE;
A OFFDUTY.AVAILABLE%TYPE;
CURSOR C1 IS SELECT * FROM TRAINEE;
CURSOR C2 IS SELECT * FROM OFFDUTY WHERE CREW_ID=:NEW.CREW_ID AND ISLIVE='Y';
T TRAINEE%ROWTYPE;
R OFFDUTY%ROWTYPE;
BEGIN
--CHECKS IF A EMPLOYEE IS MEDICALLY FIT
SELECT STATUS INTO S FROM MEDICAL
WHERE CREW_ID=:NEW.CREW_ID;
IF S LIKE 'UNFIT'
THEN
RAISE_APPLICATION_ERROR(-20001,'EMPLOYEE IS UNFIT!!!');
END IF;
DBMS_OUTPUT.PUT_LINE('MEDICALLY FIT');
--CHECKS IF EMPLOYEE IS UNDER ANY TRAINING
OPEN C1;
LOOP
FETCH C1 INTO T;
EXIT WHEN C1%NOTFOUND;
IF T.CREW_ID=:NEW.CREW_ID
THEN RAISE_APPLICATION_ERROR(-20002,'EMPLOYEE IS UNDER TRAINING');
END IF;
END LOOP;
CLOSE C1;
DBMS_OUTPUT.PUT_LINE('NOT UNDER ANY TRAINING');
```

```

--CHECKS IF EMPLOYEE IS HAVING REFRESHER TRAINING DUE
SELECT CDATE+INTERVAL '1' YEAR INTO D FROM PREVIOUS_TRAINING
WHERE CREW_ID=:NEW.CREW_ID AND TRAINING_ID=572
ORDER BY CDATE DESC
FETCH FIRST 1 ROW ONLY;
IF D<SYSDATE
THEN RAISE_APPLICATION_ERROR(-20003,'REFRESHER TRAINING IS DUE!!');
END IF;
DBMS_OUTPUT.PUT_LINE('NO DUE ON REFRESHER TRAINING ');
--CHECKS IF EMPLOYEE IS AVAILABLE OTHER WAY IS HE/SHE UNDER REST
OPEN C2;
FETCH C2 INTO R;
IF C2%FOUND THEN
IF R.AVAILABLE >:NEW.SIGNON
THEN RAISE_APPLICATION_ERROR(-20004,'EMPLOYEE IS UNDER REST');
END IF;
END IF;
UPDATE ONDUTY
SET ISLIVE='N'
WHERE CREW_ID=:NEW.CREW_ID AND ISLIVE='Y';
UPDATE OFFDUTY
SET ISLIVE='N'
WHERE CREW_ID=:NEW.CREW_ID AND ISLIVE='Y';
DBMS_OUTPUT.PUT_LINE('AVAIL_AT '||:NEW.AVAIL_AT);
UPDATE STATUS
SET AVAIL_AT= :NEW.AVAIL_AT
WHERE CREW_ID=:NEW.CREW_ID;
CLOSE C2;
DBMS_OUTPUT.PUT_LINE('CAN GO ON DUTY');
END;

```

OFFDUTY_EVAL:

```
CREATE OR REPLACE TRIGGER OFFDUTY_EVAL BEFORE INSERT ON OFFDUTY
FOR EACH ROW
DECLARE
CURSOR C1 IS SELECT * FROM TRAINEE;
T TRAINEE%ROWTYPE;
HEADQ HEADQUARTERS.HQ%TYPE;
BEGIN
--CHECKS IF EMPLOYEE IS UNDER ANY TRAINING
SELECT HQ INTO HEADQ FROM CREW NATURAL JOIN HEADQUARTERS
WHERE CREW_ID=:NEW.CREW_ID;
IF HEADQ = :NEW.AVAIL_AT THEN
IF :NEW.AVAILABLE< (:NEW.LAST_SIGNOFF+ INTERVAL '16' HOUR)
THEN RAISE_APPLICATION_ERROR(-20005,'EMPLOYEE MUST HAVE ATLEAST 16 HRS HEADQUARTER
REST');
END IF;
ELSE
IF :NEW.AVAILABLE< (:NEW.LAST_SIGNOFF+ INTERVAL '6' HOUR)
THEN RAISE_APPLICATION_ERROR(-20006,'EMPLOYEE MUST BE AVAILABLE AFTER ATLEAST 6
HOURS');
END IF;
END IF;
OPEN C1;
LOOP
FETCH C1 INTO T;
EXIT WHEN C1%NOTFOUND;
IF T.CREW_ID=:NEW.CREW_ID
THEN RAISE_APPLICATION_ERROR(-20002,'EMPLOYEE IS UNDER TRAINING');
END IF;
END LOOP;
CLOSE C1;
```

```
DBMS_OUTPUT.PUT_LINE('NOT UNDER ANY TRAINING');

UPDATE ONDUTY

SET ISLIVE='N'

WHERE CREW_ID=:NEW.CREW_ID AND ISLIVE='Y';

UPDATE OFFDUTY

SET ISLIVE='N'

WHERE CREW_ID=:NEW.CREW_ID AND ISLIVE='Y';

UPDATE STATUS

SET AVAIL_AT=:NEW.AVAIL_AT

WHERE CREW_ID=:NEW.CREW_ID;

END;
```

TRAINEE EVAL:

```
CREATE OR REPLACE TRIGGER TRAINEE_EVAL BEFORE INSERT ON TRAINEE

FOR EACH ROW

BEGIN

UPDATE OFFDUTY

SET ISLIVE='N'

WHERE CREW_ID=:NEW.CREW_ID AND ISLIVE='Y';

UPDATE STATUS

SET AVAIL_AT=:NEW.AVAIL_AT

WHERE CREW_ID=:NEW.CREW_ID;

DBMS_OUTPUT.PUT_LINE('TRAINEE REGISTERED');

END;
```

INSERTIONS ON ONDUTY, OFFDUTY, TRAINEE, PREVIOUS_TRAINING TABLES:

To ensure that the on-duty and off-duty tables accurately reflect the daily activities of the crew members, it is important that the insertions into these tables are not made in a strictly serial manner.

Instead, the insertions should be made randomly and in a manner that reflects the “actual sequence of on-duty and off-duty periods “. Here are some insertions on these tables over a period of 2 days:

```
INSERT INTO ONDUTY VALUES('KZJ1224',TIMESTAMP'2023-05-12  
09:15:00',12345,12754,'KZJ','Y');--KZJ TO BDCR
```

```
INSERT INTO ONDUTY VALUES('BDCR5888',TIMESTAMP'2023-05-12  
09:35:00',21342,16555,'BDCR','Y');--BDCR TO KZJ
```

```
INSERT INTO OFFDUTY VALUES('DKJ1234',TIMESTAMP'2023-05-12  
09:50:00',TIMESTAMP'2023-05-13 02:00:00','DKJ','Y');--HQ
```

```
INSERT INTO OFFDUTY VALUES('KZJ1224',TIMESTAMP'2023-05-12  
15:00:00',TIMESTAMP'2023-05-12 23:00:00','BDCR','Y');--BDCR
```

```
INSERT INTO OFFDUTY VALUES('BDCR5888',TIMESTAMP'2023-05-12 15:45:00',TIMESTAMP  
'2023-05-12 23:50:00','KZJ','Y');--KZJ
```

```
INSERT INTO ONDUTY VALUES('SC2345',TIMESTAMP'2023-05-12  
16:00:00',23451,17011,'SC','Y');--SC TO KZJ
```

```
INSERT INTO ONDUTY VALUES('BPQ3456',TIMESTAMP'2023-05-12  
17:50:00',21349,77777,'BPQ','Y');--BPQ TO SC
```

--THIS GIVES ERROR AS HE HAS TRAINING DUE

```
INSERT INTO ONDUTY VALUES('ZN1357',TIMESTAMP'2023-05-12  
19:30:00',98099,90008,'ZN','Y');--ZN TO GNP
```

```
INSERT INTO TRAINEE VALUES('ZN1357','KZJ',572);
```

```
INSERT INTO TRAINEE VALUES('BZA7522','KZJ',572);
```

```
INSERT INTO ONDUTY VALUES('BZA4567',TIMESTAMP'2023-05-12  
20:50:00',98199,67245,'ZN','Y');--BZA TO BDCR
```

```
INSERT INTO OFFDUTY VALUES('SC2345',TIMESTAMP'2023-05-12 21:45:00',TIMESTAMP  
'2023-05-13 04:15:00','KZJ','Y');--KZJ
```

```
INSERT INTO ONDUTY VALUES('KZJ1224',TIMESTAMP'2023-05-12  
23:25:00',56784,16555,'BDCR','Y');--BDCR TO KZJ
```

```
INSERT INTO OFFDUTY VALUES('BPQ3456',TIMESTAMP'2023-05-13 00:13:00',TIMESTAMP  
'2023-05-13 08:15:00','SC','Y');--SC
```

```
INSERT INTO ONDUTY VALUES('BDCR5888',TIMESTAMP '2023-05-13  
00:15:00',12123,12754,'KZJ','Y');--KZJ TO BDCR
```

```
INSERT INTO ONDUTY VALUES('DKJ1234',TIMESTAMP'2023-05-13
02:40:00',80453,17208,'DKJ','Y');--DKL TO NSL

INSERT INTO OFFDUTY VALUES('BZA4567',TIMESTAMP'2023-05-13 03:10:00',TIMESTAMP
'2023-05-13 11:15:00','BDCR','Y');--BDCR

INSERT INTO ONDUTY VALUES('SC2345',TIMESTAMP '2023-05-13
05:45:00',65789,12888,'KZJ','Y');--KZJ TO SC

INSERT INTO OFFDUTY VALUES('KZJ1224',TIMESTAMP'2023-05-13
06:45:00',TIMESTAMP'2023-05-13 23:00:00','KZJ','Y');--HQ

INSERT INTO OFFDUTY VALUES('BDCR5888',TIMESTAMP '2023-05-13
07:58:00',TIMESTAMP'2023-05-14 01:10:00','BDCR','Y');--HQ

INSERT INTO ONDUTY VALUES('SC6789',TIMESTAMP'2023-05-13
07:50:00',87878,17234,'SC','Y');--SC TO KZJ

INSERT INTO ONDUTY VALUES('BPQ3456',TIMESTAMP '2023-05-13
08:30:00',90912,12721,'SC','Y');--SC TO BPQ

INSERT INTO OFFDUTY VALUES('SC2345',TIMESTAMP '2023-05-13 08:55:00',TIMESTAMP
'2023-05-14 04:30:00','SC','Y');--HQ

INSERT INTO OFFDUTY VALUES('DKJ1234',TIMESTAMP'2023-05-13
09:00:00',TIMESTAMP'2023-05-13 17:00:00','NSL','Y');--NSL

INSERT INTO OFFDUTY VALUES('SC2345',TIMESTAMP '2023-05-13 09:35:00',TIMESTAMP
'2023-05-14 03:45:00','SC','Y');--HQ

INSERT INTO ONDUTY VALUES('BZA4567',TIMESTAMP '2023-05-13
11:35:00',33442,17891,'BDCR','Y');--BDCR TO BZA

INSERT INTO TRAINEE VALUES('KZJ7891','SC',689);

INSERT INTO ONDUTY VALUES('DKJ8912',TIMESTAMP'2023-05-13
12:00:00',12176,17206,'DKJ','Y');--DKJ TO NSL

INSERT INTO ONDUTY VALUES('KZJ9124',TIMESTAMP'2023-05-13
13:26:00',76854,10007,'NULL','Y');--KZJ TO KRMR

INSERT INTO TRAINEE VALUES('BDCR5888','BPQ',104);

INSERT INTO ONDUTY VALUES('KZJ9124',TIMESTAMP'2023-05-13
15:00:00',54612,12722,'KZJ','Y');--KZJ TO ZN

INSERT INTO OFFDUTY VALUES('BZA4567',TIMESTAMP'2023-05-13
16:30:00',TIMESTAMP'2023-05-14 12:00:00','BZA','Y');--HQ

INSERT INTO ONDUTY VALUES('BDCR5678',TIMESTAMP'2023-05-13
17:45:00',65378,16555,'BDCR','Y');--BDCR TO KZJ
```

INSERT INTO PREVIOUS_TRAINING VALUES('ZN1357',TO_DATE('28-MAY-2023','DD-MM-YYYY'),572);

ONDUTY:

CREW_ID	SIGNON	LOCO_NO	TRAIN_NO	AVAIL_AT	ISLIVE
1 KZJ1224	12-05-23 9:15:00.000000000 AM	12345	12754 KZJ	N	
2 BDCR5888	12-05-23 9:35:00.000000000 AM	21342	16555 BDCR	N	
3 SC2345	12-05-23 4:00:00.000000000 PM	23451	17011 SC	N	
4 BPQ3456	12-05-23 5:50:00.000000000 PM	21349	77777 BPQ	N	
5 BZA4567	12-05-23 8:50:00.000000000 PM	98199	67245 ZN	N	
6 KZJ1224	12-05-23 11:25:00.000000000 PM	56784	16555 BDCR	N	
7 BDCR5888	13-05-23 12:15:00.000000000 AM	12123	12754 KZJ	N	
8 DKJ1234	13-05-23 2:40:00.000000000 AM	80453	17208 DKJ	N	
9 SC2345	13-05-23 5:45:00.000000000 AM	65789	12888 KZJ	N	
10 SC6789	13-05-23 7:50:00.000000000 AM	87878	17234 SC	Y	
11 BPQ3456	13-05-23 8:30:00.000000000 AM	90912	12721 SC	Y	
12 BZA4567	13-05-23 11:35:00.000000000 AM	33442	17891 BDCR	N	
13 DKJ8912	13-05-23 12:00:00.000000000 PM	12176	17206 DKJ	Y	
14 KZJ9124	13-05-23 1:26:00.000000000 PM	76854	10007 NULL	N	
15 KZJ9124	13-05-23 3:00:00.000000000 PM	54612	12722 KZJ	Y	
16 BDCR5678	13-05-23 5:45:00.000000000 PM	65378	16555 BDCR	Y	

OFFDUTY:

CREW_ID	LAST_SIGNOFF	AVAILABLE	AVAIL_AT	ISLIVE
1 DKJ1234	12-05-23 9:50:00.000000000 AM	13-05-23 2:00:00.000000000 AM	DKJ	N
2 KZJ1224	12-05-23 3:00:00.000000000 PM	12-05-23 11:00:00.000000000 PM	BDCR	N
3 BDCR5888	12-05-23 3:45:00.000000000 PM	12-05-23 11:50:00.000000000 PM	KZJ	N
4 SC2345	12-05-23 9:45:00.000000000 PM	13-05-23 4:15:00.000000000 AM	KZJ	N
5 BPQ3456	13-05-23 12:13:00.000000000 AM	13-05-23 8:15:00.000000000 AM	SC	N
6 BZA4567	13-05-23 3:10:00.000000000 AM	13-05-23 11:15:00.000000000 AM	BDCR	N
7 KZJ1224	13-05-23 6:45:00.000000000 AM	13-05-23 11:00:00.000000000 PM	KZJ	Y
8 BDCR5888	13-05-23 7:58:00.000000000 AM	14-05-23 1:10:00.000000000 AM	BDCR	N
9 SC2345	13-05-23 8:55:00.000000000 AM	14-05-23 4:30:00.000000000 AM	SC	N
10 DKJ1234	13-05-23 9:00:00.000000000 AM	13-05-23 5:00:00.000000000 PM	NSL	Y
11 SC2345	13-05-23 9:35:00.000000000 AM	14-05-23 3:45:00.000000000 AM	SC	Y
12 BZA4567	13-05-23 4:30:00.000000000 PM	14-05-23 12:00:00.000000000 PM	BZA	Y

TRAINEE:

	CREW_ID	AVAIL_AT	TRAINING_ID
1	BZA7522	KZJ	572
2	KZJ7891	SC	689
3	BDCR5888	BPQ	104

STATUS:

	CREW_ID	AVAIL_AT
1	KZJ1224	KZJ
2	DKJ1234	NSL
3	SC2345	SC
4	BPQ3456	SC
5	BZA4567	BZA
6	BDCR5678	BDCR
7	SC6789	SC
8	KZJ7891	SC
9	DKJ8912	DKJ
10	KZJ9124	KZJ
11	ZN1357	KZJ
12	BZA7522	KZJ
13	BDCR5888	BPQ

PREVIOUS TRAINING:

	CREW_ID	CDATE	TRAINING_ID
1	KZJ1224	10-09-22	572
2	DKJ1234	01-12-22	572
3	SC2345	21-10-22	572
4	BPQ3456	30-11-22	572
5	BZA4567	07-01-23	572
6	BDCR5678	12-02-23	572
7	SC6789	04-06-22	572
8	KZJ7891	23-03-23	572
9	DKJ8912	15-09-22	572
10	KZJ9124	06-12-22	572
11	ZN1357	27-03-22	572
12	BZA7522	18-04-22	572
13	BDCR5888	26-01-23	572
14	ZN1357	28-05-23	572

QUERIES:

1. FIND THE EMPLOYEES WHO HAVE/HAD THERE ON DUTY IN KAZIPET STATION.

```
SELECT * FROM ONDUTY WHERE TRAIN_NO IN(  
SELECT TRAIN_NO FROM TRAIN_INFO WHERE ROUTEID IN(  
SELECT ROUTE_ID FROM ROUTE_DETAILS WHERE FROM_STATION='KZJ'  
));
```

CREW_ID	SIGNON	LOCO_NO	TRAIN_NO	AVAIL_AT	ISLIVE
1 KZJ1224	12-05-23 9:15:00.000000000 AM	12345	12754 KZJ		N
2 BDCR5888	13-05-23 12:15:00.000000000 AM	12123	12754 KZJ		N
3 SC2345	13-05-23 5:45:00.000000000 AM	65789	12888 KZJ		N
4 KZJ9124	13-05-23 1:26:00.000000000 PM	76854	10007 NULL		N
5 KZJ9124	13-05-23 3:00:00.000000000 PM	54612	12722 KZJ		Y

2. FIND THE EMPLOYEES WHO ARE AVAILABLE AT SC AFTER 2:00:00 ON 14TH MAY,2023 AND ASSIGN DUTY TO THE FIRST AVAILABLE EMPLOYEE TO WORK FOR TRAIN_NO '12721' AT 09:00:00.

```
DECLARE  
C OFFDUTY.CREW_ID%TYPE;  
  
BEGIN  
SELECT CREW_ID INTO C FROM OFFDUTY  
WHERE ISLIVE='Y' AND AVAIL_AT='SC' AND AVAILABLE>'14-05-2023 02:00:00'  
ORDER BY AVAILABLE  
FETCH FIRST 1 ROW ONLY;  
  
INSERT INTO ONDUTY VALUES(C,TIMESTAMP'2023-05-14 09:00:00',21342,12721,'SC','Y');  
  
EXCEPTION  
  
WHEN NO_DATA_FOUND THEN  
DBMS_OUTPUT.PUT_LINE('NO CREW AVAILABLE!!!');  
  
END;
```

```

MEDICALLY FIT
NOT UNDER ANY TRAINING
NO DUE ON REFRESHER TRAINING
AVAIL_AT SC
CAN GO ON DUTY

```

```

PL/SQL procedure successfully completed.

```

	CREW_ID	SIGNON	LOCO_NO	TRAIN_NO	AVAIL_AT	ISLIVE
1	KZJ1224	12-05-23 9:15:00.000000000 AM	12345	12754	KZJ	N
2	BDCR5888	12-05-23 9:35:00.000000000 AM	21342	16555	BDCR	N
3	SC2345	12-05-23 4:00:00.000000000 PM	23451	17011	SC	N
4	BPQ3456	12-05-23 5:50:00.000000000 PM	21349	77777	BPQ	N
5	BZA4567	12-05-23 8:50:00.000000000 PM	98199	67245	ZN	N
6	KZJ1224	12-05-23 11:25:00.000000000 PM	56784	16555	BDCR	N
7	BDCR5888	13-05-23 12:15:00.000000000 AM	12123	12754	KZJ	N
8	DKJ1234	13-05-23 2:40:00.000000000 AM	80453	17208	DKJ	N
9	SC2345	13-05-23 5:45:00.000000000 AM	65789	12888	KZJ	N
10	SC6789	13-05-23 7:50:00.000000000 AM	87878	17234	SC	Y
11	BPQ3456	13-05-23 8:30:00.000000000 AM	90912	12721	SC	Y
12	BZA4567	13-05-23 11:35:00.000000000 AM	33442	17891	BDCR	N
13	DKJ8912	13-05-23 12:00:00.000000000 PM	12176	17206	DKJ	Y
14	KZJ9124	13-05-23 1:26:00.000000000 PM	76854	10007	NULL	N
15	KZJ9124	13-05-23 3:00:00.000000000 PM	54612	12722	KZJ	Y
16	BDCR5678	13-05-23 5:45:00.000000000 PM	65378	16555	BDCR	Y
17	SC2345	14-05-23 9:00:00.000000000 AM	21342	12721	SC	Y

3. WRITE A PL/ SQL BLOCK TO KNOW WHETHER AN EMPLOYEE E IS AVAILABLE AT/BEFORE TIME T OR NOT. IF AVAILABLE DISPLAY THE AVAILABLE TIME.

```

DECLARE
E CREW.CREW_ID%TYPE;
T TIMESTAMP;
A TIMESTAMP;
BEGIN
E:=&E;
T:=&T;
SELECT AVAILABLE INTO A FROM OFFDUTY
WHERE CREW_ID=E AND AVAILABLE<T AND ISLIVE='Y';

```

```

DBMS_OUTPUT.PUT_LINE('AVAILABLE AT '||A);

EXCEPTION

WHEN NO_DATA_FOUND THEN

DBMS_OUTPUT.PUT_LINE(E|| ' IS NOT AVAILABLE BEFORE '||T);

END;

```

```

new:DECLARE
E CREW.CREW_ID%TYPE;
T TIMESTAMP;
A TIMESTAMP;
BEGIN
E:='KZJ1224';
T:='14-05-2023 12:00:00 AM';
SELECT AVAILABLE INTO A FROM OFFDUTY
WHERE CREW_ID=E AND AVAILABLE<T AND ISLIVE='Y';
DBMS_OUTPUT.PUT_LINE('AVAILABLE AT '||A);
EXCEPTION
WHEN NO_DATA_FOUND THEN
DBMS_OUTPUT.PUT_LINE(E|| ' IS NOT AVAILABLE BEFORE '||T);
END;
AVAILABLE AT 13-05-23 11:00:00.000000 PM

PL/SQL procedure successfully completed.

```

4. WRITE A PL/SQL BLOCK TO FIND THE EMPLOYEE'S CURRENT STATUS.

```

DECLARE

FLAG INTEGER DEFAULT 1;

E CREW.CREW_ID%TYPE:=&E;

CURSOR C1 IS SELECT * FROM ONDUTY WHERE CREW_ID=E AND ISLIVE='Y';

CURSOR C2 IS SELECT * FROM OFFDUTY WHERE CREW_ID=E AND ISLIVE='Y';

CURSOR C3 IS SELECT * FROM TRAINEE WHERE CREW_ID=E;

R1 ONDUTY%ROWTYPE;

R2 OFFDUTY%ROWTYPE;

R3 TRAINEE%ROWTYPE;

BEGIN

OPEN C1;

OPEN C2;

OPEN C3;

```

```
FETCH C1 INTO R1;
IF C1%NOTFOUND
THEN
FETCH C2 INTO R2;
IF C2%NOTFOUND
THEN
FETCH C3 INTO R3;
IF C3%NOTFOUND
THEN
DBMS_OUTPUT.PUT_LINE('EMPLOYEE NOT FOUND!');
ELSE
DBMS_OUTPUT.PUT_LINE('EMPLOYEE IS UNDER TRAINING');
END IF;
ELSE
DBMS_OUTPUT.PUT_LINE('EMPLOYEE IS OFFDUTY ,WILL BE AVAILABLE AFTER
'||R2.AVAILABLE);
END IF;
ELSE
DBMS_OUTPUT.PUT_LINE('EMPLOYEE IS ON DUTY WORKING ON '||R1.TRAIN_NO||' SIGN
ON AT '||R1.SIGNON);
END IF;
CLOSE C1;
CLOSE C2;
CLOSE C3;
END;
FOR EMPLOYEE 'SC6789'
```

```
EMPLOYEE IS ON DUTY WORKING ON 17234 SIGN ON AT 13-05-23 7:50:00.000000 AM
```

```
PL/SQL procedure successfully completed.
```

5. DISPLAY THE DETAILS OF ALL EMPLOYEES WHO ARE MEDICALLY FIT.

SELECT * FROM CREW NATURAL JOIN HEADQUARTERS NATURAL JOIN CREW_DATA
NATURAL JOIN STATUS NATURAL JOIN MEDICAL
WHERE STATUS = 'FIT';

CREW_ID	LI_ID	EMP_NO	FIRST_NAME	LAST_NAME	TRACTION	CREW_TYPE	HQ	GENDER	DOB	HIRE_DATE	ADDRESS	AVAIL_AT	MSTANDARD	STATUS	DUE DATE	
1	KZJ1224	KZJ3241	123454321	ARJUN	DESAI	ELEC	LPG	KZJ	M	10-09-79	12-10-01	HN0.31-1-1234,SVS HOMES,HNK	KZJ	A	FIT	16-01-24
2	DKJ1234	DKJ6123	123456789	RAKESH	PONNALA	DISL	LPG	DKJ	M	01-12-75	22-01-00	HN0.12-2-1747,PANIMALA COLONY,TNK NSL	B	FIT	01-12-23	
3	SC2345	SC1367	246813579	SAHIL	KANTAM	ELEC	ALP	SC	M	21-10-70	15-08-99	HN0.21-3-3412,JAWAHAR COLONY,IGK	SC	B	FIT	06-04-24
4	BPQ3456	BPQ1573	135792468	SANHTOSH	BEEMOJU	DUAL	LPM	BPQ	M	30-11-78	01-03-01	HN0.11-5-1111,ARTS COLLEGE,BPA	SC	A	FIT	11-09-23
5	BZA4567	BZA7341	357912468	ANJALI	ADIVI	ELEC	LPG	BZA	F	07-01-72	21-06-97	HN0.31-4-4432,ADVOCATES,SUR	BZA	A	FIT	07-11-23
6	BDCR5678	BDCR9787	579132468	FREETHAM	KONDRA	ELEC	LPG	BDCR	M	12-02-76	02-07-03	HN0.22-2-8989,TEACHERS,LPR	BDCR	A	FIT	02-08-23
7	SC6789	SC1367	132465798	GOFI	GANTA	DUAL	LPP	SC	M	04-06-73	01-09-98	HN0.15-1-4521,JUBILEE HILLS,MTU	SC	B	FIT	03-02-24
8	KZJ7891	KZJ5676	987654321	VEDHIKA	MUSIPATLA	DISL	LPM	KZJ	F	23-07-76	19-01-99	HN0.17-7-1666,BANJARA HILLS,WDO	SC	B	FIT	12-06-23
9	DKJ8912	DKJ6565	876549321	KIRAN	POBBATHI	ELEC	LPG	DKJ	M	15-09-80	17-04-04	HN0.23-8-2234,KU,KLP	DKJ	A	FIT	21-08-23
10	KZJ9124	KZJ3241	453267891	RAAMESH	CHALLA	DUAL	LPP	KZJ	M	06-11-87	30-09-07	HN0.14-9-7865,VISHWA COLONY,WGL	KZJ	B	FIT	21-08-23
11	ZN1357	ZN1928	864209351	SHESHU	VELAGANDULA	ELEC	ALG	ZN	M	27-03-75	08-10-98	HN0.24-2-1290,SAINATH COLONY,KJU	KZJ	A	FIT	23-01-24
12	BZA7522	BZA7432	192837465	RAHUL	VUPPALA	ELEC	LPP	BZA	M	18-04-76	16-01-02	HN0.31-1-8531,INDHU COLONY,RTY	KZJ	B	FIT	17-06-23
13	BDCR5888	BDCR5999	597321475	NIKHIL	GANULA	DUAL	LPG	BDCR	M	26-01-78	12-02-01	HN0.24-5-9752,IRCTC,VVK	BPQ	A	FIT	16-03-24