Part 2 - Database implementation and Testing

Task 3: Database Implementation

DDL for Table ALLOCATIONRESOLVELOG

CREATE TABLE ALLOCATIONRESOLVELOG

```
(      "PROBLEMLOGNO" CHAR(10 BYTE) ,

       "FIRSTALLOCATEDSTAFFID" CHAR(6 BYTE) ,

       "SECONDALLOCATEDSTAFFID" CHAR(6 BYTE) ,

       "PROBLEMALLOCATEDBY" CHAR(6 BYTE) ,

       "PROBLEMSTATUS" CHAR(20 BYTE) ,

       "PROBLEMALLOCATEDDATE" DATE,

       "PROBLEMRESOLVEDDATE" DATE,

       "PROBLEMRESOLVEDTIME" NUMBER(3,0) DEFAULT 0,

       "PROBLEMRESOLVEDDETAILS" VARCHAR2(100 BYTE) DEFAULT NULL,

       "THIRDALLOCATEDSTAFF" CHAR(6 BYTE) ,

       "PROBLEMALLOCATIONNO" CHAR(10 BYTE) ,

       "PROBLEMOCCURINGLOGNO" CHAR(10 BYTE)

) ;
```

   COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMLOGNO" IS 'A foreign key that refers to ProblemLog(ProblemLogNo)';

   COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."FIRSTALLOCATEDSTAFFID" IS 'The first staff to resolve the given problem log. ';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."SECONDALLOCATEDSTAFFID" IS 'The problem log has been transferred to the second staff as it is not resolved';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMALLOCATEDBY" IS 'The staff who will decide to allocate the problemlog. ';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMSTATUS" IS 'Problem staus which is either resolved or not_resolved ';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMALLOCATEDDATE" IS 'Problem allocated date';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMRESOLVEDDATE" IS 'Problem resolved date';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMRESOLVEDTIME" IS 'Number of days to resolve a problem log.';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMRESOLVEDDETAILS" IS 'Details of how the problem was solved.';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."THIRDALLOCATEDSTAFF" IS 'The problem log has been transferred to the third staff as it is still not resolved.';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMALLOCATIONNO" IS 'A primary key to allocate a problem log ';

COMMENT ON COLUMN "ALLOCATIONRESOLVELOG"."PROBLEMOCCURINGLOGNO" IS 'Log of occuring problems';

Insert into ALLOCATIONRESOLVELOG (PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBLEMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLVEDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATEDSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG04 ','ST10 ','NA ','ST10 ','RESOLVED ',to_date('06-OCT-20','DD-MON-RR'),to_date('07-OCT-20','DD-MON-RR'),1,'By installing an up-to-date printer driver.','NA ','PALL01 ','PLOG03 ');

Insert into ALLOCATIONRESOLVELOG (PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBLEMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLVEDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATEDSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG05 ','ST02 ','NA   ','ST07 ','RESOLVED   ',to_date('12-OCT-20','DD-MON-RR'),to_date('14-OCT-20','DD-MON-RR'),2,'Use a different USB dongle for the wireless mouse.','NA   ','PALL02   ','PLOG02   ');

Insert into ALLOCATIONRESOLVELOG (PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBLEMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLVEDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATEDSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG01 ','ST03 ','ST05 ','ST04 ','NOTRESOLVED   ',to_date('02-OCT-20','DD-MON-RR'),to_date('29-OCT-20','DD-MON-RR'),0,'By replacing cables and faulty switch','ST11 ','PALL03   ','PLOG08   ');

Insert into ALLOCATIONRESOLVELOG (PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBLEMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLVEDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATEDSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG07 ','ST01 ','ST09 ','ST10 ','RESOLVED   ',to_date('09-OCT-20','DD-MON-RR'),to_date('15-OCT-20','DD-MON-RR'),4,'Repair corrupted window and upgrade Malware. ','NA   ','PALL04   ','PLOG03   ');

Insert into ALLOCATIONRESOLVELOG (PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBLEMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLVEDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATEDSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG06 ','ST06 ','ST09 ','ST04 ','RESOLVED   ',to_date('21-OCT-20','DD-MON-RR'),to_date('23-OCT-20','DD-MON-RR'),2,'Reset hub to factory setting.','NA   ','PALL05 ','PLOG02   ');

Insert into ALLOCATIONRESOLVELOG (PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBLEMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLV

EDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATE
DSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG08
','ST07 ','ST09 ','ST04 ','NOTRESOLVED   ',to_date('05-OCT-20','DD-MON-
RR'),to_date('29-OCT-20','DD-MON-RR'),11,'By replacing cables and faulty switch','ST11
','PALL06 ','PLOG07 ');

Insert into ALLOCATIONRESOLVELOG
(PROBLEMLOGNO,FIRSTALLOCATEDSTAFFID,SECONDALLOCATEDSTAFFID,PROBL
EMALLOCATEDBY,PROBLEMSTATUS,PROBLEMALLOCATEDDATE,PROBLEMRESOLV
EDDATE,PROBLEMRESOLVEDTIME,PROBLEMRESOLVEDDETAILS,THIRDALLOCATE
DSTAFF,PROBLEMALLOCATIONNO,PROBLEMOCCURINGLOGNO) values ('PLOG02
','ST07 ','NA   ','ST07 ','RESOLVED   ',to_date('02-OCT-20','DD-MON-
RR'),to_date('26-OCT-20','DD-MON-RR'),24,'Replacement of faculty motherboard,HDD and
powersupply.','NA   ','PALL08 ','PLOG03 ');

Constraints for Table ALLOCATIONRESOLVELOG

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("PROBLEMLOGNO" NOT NULL
ENABLE);

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("FIRSTALLOCATEDSTAFFID"
NOT NULL ENABLE);

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("SECONDALLOCATEDSTAFFID"
NOT NULL ENABLE);

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("PROBLEMALLOCATEDBY" NOT
NULL ENABLE);

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("PROBLEMSTATUS" NOT NULL
ENABLE);

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("PROBLEMALLOCATEDDATE"
NOT NULL ENABLE);

  ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("PROBLEMRESOLVEDDETAILS"
NOT NULL ENABLE);

```
ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("THIRDALLOCATEDSTAFF" NOT
NULL ENABLE);

ALTER TABLE ALLOCATIONRESOLVELOG MODIFY ("PROBLEMALLOCATIONNO"
NOT NULL ENABLE);

ALTER TABLE ALLOCATIONRESOLVELOG ADD CONSTRAINT
"PROBLEMALLOCATIONLOG_PK" PRIMARY KEY ("PROBLEMALLOCATIONNO")

ALTER TABLE ALLOCATIONRESOLVELOG ADD CONSTRAINT
"PROBLEMALLOCATIONLOG_FK1" FOREIGN KEY ("PROBLEMLOGNO")

        REFERENCES PROBLEMLOG("PROBLEMLOGNO") ON DELETE CASCADE
ENABLE;
```

DDL for Table CALL

```
CREATE TABLE CALL

(      "CALLNO" CHAR(6 BYTE) ,

       "CallDateTime" TIMESTAMP (1) WITH LOCAL TIME ZONE,

       "CALLDURATION" NUMBER(3,0),

       "CALLDETAILS" VARCHAR2(50 BYTE) ,

       "FOLLOWUPCALLDETAILS" VARCHAR2(50 BYTE) DEFAULT 'NA',

       "STAFFID" CHAR(6 BYTE)

) ;


COMMENT ON COLUMN "CALL"."CALLNO" IS 'A primary key to represent a call';

COMMENT ON COLUMN "CALL"."CallDateTime" IS 'Time of the incoming call';

COMMENT ON COLUMN "CALL"."CALLDURATION" IS 'Call duration in minutes';

COMMENT ON COLUMN "CALL"."CALLDETAILS" IS 'Details of a call';

COMMENT ON COLUMN "CALL"."FOLLOWUPCALLDETAILS" IS 'Details of a follow up
call if applicable';

COMMENT ON COLUMN "CALL"."STAFFID" IS 'A foreign key refers to ITstaff(StaffID)';


Insert into CALL
(CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,ST
AFFID) values ('CN09  ',to_timestamp('23-OCT-20 11.41.10.300000000','DD-MON-RR
HH24.MI.SSXFF'),50,'Hub is not working.','A new hub was ordered on 26-oct.','ST03  ');

Insert into CALL
(CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,ST
AFFID) values ('CN10  ',to_timestamp('13-OCT-20 09.47.24.600000000','DD-MON-RR
HH24.MI.SSXFF'),18,'Skype is not working.','NA','ST08  ');
```

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN01 ',to_timestamp('27-OCT-20 12.03.59.000000000','DD-MON-RR HH24.MI.SSXFF'),15,'Printer not connecting','NA','ST10 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN02 ',to_timestamp('06-OCT-20 16.26.41.200000000','DD-MON-RR HH24.MI.SSXFF'),32,'Mac not recognising the new Wifi card.','Not resolved and client is not happy','ST03 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN03 ',to_timestamp('15-OCT-20 09.28.49.900000000','DD-MON-RR HH24.MI.SSXFF'),10,'MSExcell not working.','NA','ST02 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN04 ',to_timestamp('16-OCT-20 12.29.53.600000000','DD-MON-RR HH24.MI.SSXFF'),21,'Photoshop kept on crashing','NA','ST10 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN05 ',to_timestamp('17-OCT-20 10.31.05.300000000','DD-MON-RR HH24.MI.SSXFF'),13,'New Wifi driver not working ','Not resolved. ','ST04 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN06 ',to_timestamp('14-OCT-20 10.40.09.100000000','DD-MON-RR HH24.MI.SSXFF'),6,'Linux is not rebooting.','NA','ST05 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN07 ',to_timestamp('09-OCT-20 14.36.49.200000000','DD-MON-RR HH24.MI.SSXFF'),35,'Computer not switching on.','NA','ST06 ');

Insert into CALL (CALLNO,"CallDateTime",CALLDURATION,CALLDETAILS,FOLLOWUPCALLDETAILS,STAFFID) values ('CN08 ',to_timestamp('15-OCT-20 09.43.37.200000000','DD-MON-RR HH24.MI.SSXFF'),20,'USB mouse not detected. ','NA','ST06 ');

Constraints for Table CALL

ALTER TABLE "CALL" MODIFY ("CALLNO" NOT NULL ENABLE);

ALTER TABLE "CALL" MODIFY ("CallDateTime" NOT NULL ENABLE);

ALTER TABLE "CALL" ADD CONSTRAINT "CALLDURATIONNOTZERO" CHECK (CallDuration > 0) ENABLE;

ALTER TABLE "CALL" MODIFY ("CALLDURATION" NOT NULL ENABLE);

ALTER TABLE "CALL" MODIFY ("CALLDETAILS" NOT NULL ENABLE);

ALTER TABLE "CALL" MODIFY ("FOLLOWUPCALLDETAILS" NOT NULL ENABLE);

ALTER TABLE "CALL" MODIFY ("STAFFID" NOT NULL ENABLE);

ALTER TABLE "CALL" ADD CONSTRAINT "CALL_PK" PRIMARY KEY ("CALLNO")

ALTER TABLE "CALL" ADD CONSTRAINT "CALL_FK" FOREIGN KEY ("STAFFID")
        REFERENCES "ITSTAFF" ("STAFFID") ENABLE;

Constraints for Table CALL

DDL for Table CALLER

```
CREATE TABLE CALLER
 (    "CALLERID" CHAR(6 BYTE) ,
      "CALLERFIRSTNAME" VARCHAR2(20 BYTE) ,
      "CALLERLASTNAME" VARCHAR2(20 BYTE) ,
      "CALLERJOBTITLE" VARCHAR2(20 BYTE) ,
      "CALLERDEPARTMENT" VARCHAR2(10 BYTE) ,
      "PROBLEMLOGNO" CHAR(10 BYTE) ,
      "COMPANYEQUIPMENTNO" CHAR(10 BYTE)
 ) ;
```

```
COMMENT ON COLUMN CALLER."CALLERFIRSTNAME" IS 'Caller''s first name';

COMMENT ON COLUMN CALLER."CALLERLASTNAME" IS 'Caller''s last name';

COMMENT ON COLUMN CALLER."CALLERJOBTITLE" IS 'Job title of the caller';

COMMENT ON COLUMN CALLER."CALLERDEPARTMENT" IS 'Department of the
caller';

COMMENT ON COLUMN CALLER."PROBLEMLOGNO" IS 'A foreign key refers to
ProblemLog(ProblemLogNo)';

COMMENT ON COLUMN CALLER."COMPANYEQUIPMENTNO" IS 'A foreign key that
refers to CompanyEquipment(CompanyEquipmentNo)';
```

```
Insert into CALLER
(CALLERID,CALLERFIRSTNAME,CALLERLASTNAME,CALLERJOBTITLE,CALLERDEPA
RTMENT,PROBLEMLOGNO,COMPANYEQUIPMENTNO) values ('CA01
','Muhammad','Afzal','Administrator','Production','PLOG02    ','CE02      ');
Insert into CALLER
(CALLERID,CALLERFIRSTNAME,CALLERLASTNAME,CALLERJOBTITLE,CALLERDEPA
```

RTMENT,PROBLEMLOGNO,COMPANYEQUIPMENTNO) values ('CA02
','Anjali','Burma','Programmer','IT','PLOG05   ','CE04   ');

Insert into CALLER
(CALLERID,CALLERFIRSTNAME,CALLERLASTNAME,CALLERJOBTITLE,CALLERDEPA
RTMENT,PROBLEMLOGNO,COMPANYEQUIPMENTNO) values ('CA04
','Peter','Horn','Network Manager','HR','PLOG04   ','CE02   ');

Insert into CALLER
(CALLERID,CALLERFIRSTNAME,CALLERLASTNAME,CALLERJOBTITLE,CALLERDEPA
RTMENT,PROBLEMLOGNO,COMPANYEQUIPMENTNO) values ('CA03
','Vicky','Baldwin','System Analyst','HR','PLOG01   ','CE01   ');

Insert into CALLER
(CALLERID,CALLERFIRSTNAME,CALLERLASTNAME,CALLERJOBTITLE,CALLERDEPA
RTMENT,PROBLEMLOGNO,COMPANYEQUIPMENTNO) values ('CA05
','Adam','Sinclair','System Analyst','IT','PLOG08   ','CE08   ');

Insert into CALLER
(CALLERID,CALLERFIRSTNAME,CALLERLASTNAME,CALLERJOBTITLE,CALLERDEPA
RTMENT,PROBLEMLOGNO,COMPANYEQUIPMENTNO) values ('CA06
','Yu','Zhan','Network Manager','Payroll','PLOG07   ','CE05   ');

Constraints for Table CALLER

```
 ALTER TABLE CALLER MODIFY ("CALLERID" NOT NULL ENABLE);

 ALTER TABLE CALLER MODIFY ("CALLERFIRSTNAME" NOT NULL ENABLE);

 ALTER TABLE CALLER MODIFY ("CALLERLASTNAME" NOT NULL ENABLE);

 ALTER TABLE CALLER MODIFY ("CALLERJOBTITLE" NOT NULL ENABLE);

 ALTER TABLE CALLER MODIFY ("CALLERDEPARTMENT" NOT NULL ENABLE);

 ALTER TABLE CALLER MODIFY ("PROBLEMLOGNO" NOT NULL ENABLE);

 ALTER TABLE CALLER ADD CONSTRAINT "CALLER_PK" PRIMARY KEY ("CALLERID")

 ALTER TABLE CALLER ADD CONSTRAINT "CALLER_FK1" FOREIGN KEY
("COMPANYEQUIPMENTNO")
```

REFERENCES "COMPANYEQUIPMENT" ("COMPANYEQUIPMENTNO") ON DELETE CASCADE ENABLE;

ALTER TABLE CALLER ADD CONSTRAINT "CALLER_FK2" FOREIGN KEY ("PROBLEMLOGNO")

REFERENCES "PROBLEMLOG" ("PROBLEMLOGNO") ON DELETE CASCADE ENABLE;

DDL for Table COMPANYEQUIPMENT

```
CREATE TABLE "COMPANYEQUIPMENT"

 (      "COMPANYEQUIPMENTNO" CHAR(10 BYTE) ,

        "CALLERCOMPANY" VARCHAR2(10 BYTE) ,

        "EQUIPMENTNO" CHAR(6 BYTE)

 ) ;
```

COMMENT ON COLUMN "COMPANYEQUIPMENT"."COMPANYEQUIPMENTNO" IS 'A primary key to keep a record of companies and equipments';

Insert into COMPANYEQUIPMENT (COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE01 ','Comp1','EN01 ');

Insert into COMPANYEQUIPMENT (COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE02 ','Comp1','EN05 ');

Insert into COMPANYEQUIPMENT (COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE04 ','Comp2','EN03 ');

Insert into COMPANYEQUIPMENT (COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE05 ','Comp2','EN07 ');

Insert into COMPANYEQUIPMENT (COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE06 ','Comp3','EN05 ');

Insert into COMPANYEQUIPMENT (COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE08 ','Comp3','EN07 ');

Insert into COMPANYEQUIPMENT
(COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE09
','Comp4','EN01 ');

Insert into COMPANYEQUIPMENT
(COMPANYEQUIPMENTNO,CALLERCOMPANY,EQUIPMENTNO) values ('CE10
','Comp5','EN07 ');

Constraints for Table COMPANYEQUIPMENT

  ALTER TABLE "COMPANYEQUIPMENT" MODIFY ("COMPANYEQUIPMENTNO" NOT
NULL ENABLE);

  ALTER TABLE "COMPANYEQUIPMENT" MODIFY ("CALLERCOMPANY" NOT NULL
ENABLE);

  ALTER TABLE "COMPANYEQUIPMENT" MODIFY ("EQUIPMENTNO" NOT NULL
ENABLE);

  ALTER TABLE "COMPANYEQUIPMENT" ADD CONSTRAINT
"COMPANYEQUIPMENT_PK" PRIMARY KEY ("COMPANYEQUIPMENTNO")

  ALTER TABLE "COMPANYEQUIPMENT" ADD CONSTRAINT
"COMPANYEQUIPMENT_FK1" FOREIGN KEY ("EQUIPMENTNO")

        REFERENCES "HARDWAREEQUIPMENT" ("EQUIPMENTNO") ON DELETE
CASCADE ENABLE;

DDL for Table HARDWAREEQUIPMENT

```
CREATE TABLE "HARDWAREEQUIPMENT"

(     "EQUIPMENTNO" CHAR(6 BYTE) ,

      "EQUIPMENTTYPE" VARCHAR2(20 BYTE) ,

      "EQUIPMENTMAKE" CHAR(5 BYTE) ,

      "OSLICENCENO" CHAR(6 BYTE) ,

      "SOFTWARELICENCENO" CHAR(6 BYTE) ,

      "EQUIPMENTDESCRIPTION" VARCHAR2(50 BYTE)

) ;
```

COMMENT ON COLUMN "HARDWAREEQUIPMENT"."EQUIPMENTNO" IS 'Equipment number for each device and application. A primary key ';

COMMENT ON COLUMN "HARDWAREEQUIPMENT"."EQUIPMENTTYPE" IS 'Type of equipment including hardware and software';

COMMENT ON COLUMN "HARDWAREEQUIPMENT"."EQUIPMENTMAKE" IS 'Make of equipment';

COMMENT ON COLUMN "HARDWAREEQUIPMENT"."OSLICENCENO" IS 'A Foreign key refers to OperatingSystems(OSLicenceNo)';

COMMENT ON COLUMN "HARDWAREEQUIPMENT"."SOFTWARELICENCENO" IS 'A Foreign key refers to Software(SoftwareLicenceNo)';

COMMENT ON COLUMN "HARDWAREEQUIPMENT"."EQUIPMENTDESCRIPTION" IS 'Description of each device ';

Insert into HARDWAREEQUIPMENT
(EQUIPMENTNO,EQUIPMENTTYPE,EQUIPMENTMAKE,OSLICENCENO,SOFTWARELIC

ENCENO,EQUIPMENTDESCRIPTION) values ('EN01 ','Computer','ABC ','OS3 ','SL09 ','Desktop PCs and MACs');

Insert into HARDWAREEQUIPMENT (EQUIPMENTNO,EQUIPMENTTYPE,EQUIPMENTMAKE,OSLICENCENO,SOFTWARELIC ENCENO,EQUIPMENTDESCRIPTION) values ('EN02 ','Mobile Devices','DEF ','OS1 ','SL05 ','Laptop, palmtop and tablets');

Insert into HARDWAREEQUIPMENT (EQUIPMENTNO,EQUIPMENTTYPE,EQUIPMENTMAKE,OSLICENCENO,SOFTWARELIC ENCENO,EQUIPMENTDESCRIPTION) values ('EN03 ','Accessories','ABC ','OS2 ','SL06 ','keyboards, mice and cases');

Insert into HARDWAREEQUIPMENT (EQUIPMENTNO,EQUIPMENTTYPE,EQUIPMENTMAKE,OSLICENCENO,SOFTWARELIC ENCENO,EQUIPMENTDESCRIPTION) values ('EN04 ','Printers','ABC ','OS5 ','SL10 ','Stand-alone and network printers');

Insert into HARDWAREEQUIPMENT (EQUIPMENTNO,EQUIPMENTTYPE,EQUIPMENTMAKE,OSLICENCENO,SOFTWARELIC ENCENO,EQUIPMENTDESCRIPTION) values ('EN05 ','Storage Media','PQR ','OS4 ','SL01 ','HDD, SSD, CD and USB pen');

Insert into HARDWAREEQUIPMENT (EQUIPMENTNO,EQUIPMENTTYPE,EQUIPMENTMAKE,OSLICENCENO,SOFTWARELIC ENCENO,EQUIPMENTDESCRIPTION) values ('EN07 ','Imaging Devices','XYZ ','OS3 ','SL01 ','Scanners with OCR');

Constraints for Table HARDWAREEQUIPMENT

  ALTER TABLE "HARDWAREEQUIPMENT" MODIFY ("EQUIPMENTNO" NOT NULL ENABLE);

  ALTER TABLE "HARDWAREEQUIPMENT" MODIFY ("EQUIPMENTTYPE" NOT NULL ENABLE);

  ALTER TABLE "HARDWAREEQUIPMENT" MODIFY ("EQUIPMENTMAKE" NOT NULL ENABLE);

```
ALTER TABLE "HARDWAREEQUIPMENT" MODIFY ("OSLICENCENO" NOT NULL
ENABLE);

ALTER TABLE "HARDWAREEQUIPMENT" MODIFY ("SOFTWARELICENCENO" NOT
NULL ENABLE);

ALTER TABLE "HARDWAREEQUIPMENT" MODIFY ("EQUIPMENTDESCRIPTION" NOT
NULL ENABLE);

ALTER TABLE "HARDWAREEQUIPMENT" ADD CONSTRAINT
"HARDWAREEQUIPMENT_PK" PRIMARY KEY ("EQUIPMENTNO")

ALTER TABLE "HARDWAREEQUIPMENT" ADD CONSTRAINT
"UNIQUE_EQUIPMENTDESCRIPTION" UNIQUE ("EQUIPMENTDESCRIPTION")

ALTER TABLE "HARDWAREEQUIPMENT" ADD CONSTRAINT "SOFTWARE_FK"
FOREIGN KEY ("SOFTWARELICENCENO")

        REFERENCES "SOFTWARE" ("SOFTWARELICENCENO") ON DELETE
CASCADE ENABLE;

ALTER TABLE "HARDWAREEQUIPMENT" ADD CONSTRAINT
"OPERATINGSYSTEMS_FK" FOREIGN KEY ("OSLICENCENO")

        REFERENCES "OPERATINGSYSTEMS" ("OSLICENCENO") ON DELETE
CASCADE ENABLE;
```

DDL for Table ITSTAFF

```
CREATE TABLE "ITSTAFF"

(      "STAFFID" CHAR(6 BYTE) ,

       "STAFFFIRSTNAME" VARCHAR2(20 BYTE) ,

       "STAFFLASTNAME" VARCHAR2(20 BYTE) ,

       "JOBTITLE" VARCHAR2(20 BYTE) ,

       "CURRENTWORKINGJOBS" NUMBER(3,0) DEFAULT NULL,

       "SKILLFIELDID" CHAR(6 BYTE)

) ;
```

```
COMMENT ON COLUMN "ITSTAFF"."STAFFID" IS 'A primary key for Staff ID ';

COMMENT ON COLUMN "ITSTAFF"."STAFFFIRSTNAME" IS 'First name of a staff';

COMMENT ON COLUMN "ITSTAFF"."STAFFLASTNAME" IS 'Last name of a staff';

COMMENT ON COLUMN "ITSTAFF"."JOBTITLE" IS 'Job Title';

COMMENT ON COLUMN "ITSTAFF"."CURRENTWORKINGJOBS" IS 'Number of current
working jobs';

COMMENT ON COLUMN "ITSTAFF"."SKILLFIELDID" IS 'A foreign key refer to
Sillfield.SkillFieldID';
```

```
Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST01  ','Jim','Correy','Specialist',2,'SF01  ');
```

```
Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST02  ','Steve','Nelson','Specialist',3,'SF03  ');
```

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST03 ','Kim','Taylor','Specialist',0,'SF02 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST04 ','Clare','Hudson','HelpDesk',2,'SF04 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST05 ','Nithu','Patel','Specialist',2,'SF03 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST06 ','Jimmy','Nel','Specialist',1,'SF01 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST07 ','Sakdeep','Chauhan','Helpdesk',3,'SF04 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST08 ','Anwar','Islam','specialist',1,'SF02 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST09 ','Francis','Enabeli','specialist',0,'SF01 ');

Insert into ITSTAFF
(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,
SKILLFIELDID) values ('ST10 ','Leo','Zaki','Helpdesk',1,'SF04 ');

Constraints for Table ITSTAFF

ALTER TABLE "ITSTAFF" MODIFY ("STAFFID" NOT NULL ENABLE);

ALTER TABLE "ITSTAFF" MODIFY ("STAFFFIRSTNAME" NOT NULL ENABLE);

ALTER TABLE "ITSTAFF" MODIFY ("STAFFLASTNAME" NOT NULL ENABLE);

ALTER TABLE "ITSTAFF" MODIFY ("JOBTITLE" NOT NULL ENABLE);

ALTER TABLE "ITSTAFF" MODIFY ("CURRENTWORKINGJOBS" NOT NULL ENABLE);

ALTER TABLE "ITSTAFF" MODIFY ("SKILLFIELDID" NOT NULL ENABLE);

ALTER TABLE "ITSTAFF" ADD CONSTRAINT "ITSTAFF_PK" PRIMARY KEY ("STAFFID")

ALTER TABLE "ITSTAFF" ADD CONSTRAINT "CURRENTJOBSPOSITIVE" CHECK (CurrentWorkingJobs >= 0) ENABLE;

ALTER TABLE "ITSTAFF" ADD CONSTRAINT "FK_SKILLFIELD" FOREIGN KEY ("SKILLFIELDID")

REFERENCES "SKILLFIELD" ("SKILLFIELDID") ENABLE;

DDL for Table OPERATINGSYSTEMS

```
CREATE TABLE "OPERATINGSYSTEMS"

(     "OSLICENCENO" CHAR(6 BYTE) ,

      "OSNAME" VARCHAR2(20 BYTE) ,

      "OSLICENSESTARTDATE" DATE,

      "OSLICENSEEXPIRYDATE" DATE

) ;
```

Insert into OPERATINGSYSTEMS
(OSLICENCENO,OSNAME,OSLICENSESTARTDATE,OSLICENSEEXPIRYDATE) values
('OS1   ','Windows',to_date('01-JAN-19','DD-MON-RR'),to_date('01-JAN-22','DD-MON-RR'));

Insert into OPERATINGSYSTEMS
(OSLICENCENO,OSNAME,OSLICENSESTARTDATE,OSLICENSEEXPIRYDATE) values
('OS2   ','Mac',to_date('01-APR-20','DD-MON-RR'),to_date('01-APR-23','DD-MON-RR'));

Insert into OPERATINGSYSTEMS
(OSLICENCENO,OSNAME,OSLICENSESTARTDATE,OSLICENSEEXPIRYDATE) values
('OS3   ','Linux',to_date('01-MAR-20','DD-MON-RR'),to_date('01-APR-24','DD-MON-RR'));

Insert into OPERATINGSYSTEMS
(OSLICENCENO,OSNAME,OSLICENSESTARTDATE,OSLICENSEEXPIRYDATE) values
('OS4   ','MS-DOS',to_date('01-JAN-19','DD-MON-RR'),to_date('01-JAN-23','DD-MON-RR'));

Insert into OPERATINGSYSTEMS
(OSLICENCENO,OSNAME,OSLICENSESTARTDATE,OSLICENSEEXPIRYDATE) values
('OS5   ','Android',to_date('01-JAN-20','DD-MON-RR'),to_date('01-JAN-25','DD-MON-RR'));

Constraints for Table OPERATINGSYSTEMS

ALTER TABLE "OPERATINGSYSTEMS" MODIFY ("OSNAME" NOT NULL ENABLE);

ALTER TABLE "OPERATINGSYSTEMS" ADD CONSTRAINT "OPERATINGSYSTEMS_PK" PRIMARY KEY ("OSLICENCENO")

ALTER TABLE "OPERATINGSYSTEMS" ADD CONSTRAINT "UNIQUE_OPERATINGSYSTEMS" UNIQUE ("OSNAME")

ALTER TABLE "OPERATINGSYSTEMS" MODIFY ("OSLICENSESTARTDATE" NOT NULL ENABLE);

ALTER TABLE "OPERATINGSYSTEMS" MODIFY ("OSLICENSEEXPIRYDATE" NOT NULL ENABLE);

DDL for Table PROBLEMDESCRIPTION

```
CREATE TABLE "PROBLEMDESCRIPTION"

(    "PROBLEMNO" CHAR(6 BYTE) ,

     "PROBLEMDESCRIPTION" VARCHAR2(100 BYTE) ,

     "PROBLEMSOLUTION" VARCHAR2(100 BYTE)

) ;
```

COMMENT ON COLUMN "PROBLEMDESCRIPTION"."PROBLEMNO" IS 'A primary key for probel description';

COMMENT ON COLUMN "PROBLEMDESCRIPTION"."PROBLEMDESCRIPTION" IS 'A brief summary of the problem';

COMMENT ON COLUMN "PROBLEMDESCRIPTION"."PROBLEMSOLUTION" IS 'A brief summary of how to solve the problem';

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN01 ','MSExcell doesnot edit excell files and disable few features.','Check that client is using a licenced copy of MSExcell. Check HDD and RAM sizes. ');

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN02 ','Linux missing or non-compatiable driver','Make sure that the most up-to-date linux device driver in installed. ');

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN03 ','Windows not booting up.','Check for failed HDD, RAM or a virous. ');

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN04 ','Networking Switch is not working','Install an up to date firmware and check power and networking cables. ');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN05 ','Skype is
not working','Reinstall the new Skype app and create a microsoft account to use it.');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN06 ','Server
not starting','look for HDD, RAM, powercable or case-power button failure');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN07 ','USB
mouse is not working','Check the USB port or replace the USB key');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN08 ','Printer
not recognised on LAN','Check network cable and port. Install the up-to-date software');

Constraints for Table PROBLEMDESCRIPTION

ALTER TABLE "PROBLEMDESCRIPTION" ADD CONSTRAINT
"PROBLEMDESCRIPTION_UNIQUE" UNIQUE ("PROBLEMDESCRIPTION")

ALTER TABLE "PROBLEMDESCRIPTION" MODIFY ("PROBLEMNO" NOT NULL
ENABLE);

ALTER TABLE "PROBLEMDESCRIPTION" MODIFY ("PROBLEMDESCRIPTION" NOT
NULL ENABLE);

ALTER TABLE "PROBLEMDESCRIPTION" MODIFY ("PROBLEMSOLUTION" NOT NULL
ENABLE);

ALTER TABLE "PROBLEMDESCRIPTION" ADD CONSTRAINT
"PROBLEMDESCRIPTION_PK" PRIMARY KEY ("PROBLEMNO");

DDL for Table PROBLEMLOG

```
CREATE TABLE "PROBLEMLOG"

(     "PROBLEMLOGNO" CHAR(10 BYTE) COLLATE "USING_NLS_COMP",

      "CALLNO" CHAR(6 BYTE) COLLATE "USING_NLS_COMP",

      "EQUIPMENTNO" CHAR(6 BYTE) COLLATE "USING_NLS_COMP",

      "PROBLEMNO" CHAR(6 BYTE) COLLATE "USING_NLS_COMP"

) ;
```

```
COMMENT ON COLUMN "PROBLEMLOG"."PROBLEMLOGNO" IS 'A primary key for
logging a problem. Multiple logs could refer to one problem.';

COMMENT ON COLUMN "PROBLEMLOG"."CALLNO" IS 'A foreign key that refers to
Call(CallNO)';

COMMENT ON COLUMN "PROBLEMLOG"."EQUIPMENTNO" IS 'A foreign key that
refers to HardwareEquipment(EquipmentNo)';

COMMENT ON COLUMN "PROBLEMLOG"."PROBLEMNO" IS 'A foreign key that refers
to ProblemDescription(ProblemNo)';
```

```
Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO)
values ('PLOG01    ','CN03  ','EN01  ','PN01  ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO)
values ('PLOG02    ','CN03  ','EN03  ','PN06  ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO)
values ('PLOG04    ','CN03  ','EN07  ','PN02  ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO)
values ('PLOG05    ','CN08  ','EN02  ','PN05  ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO)
values ('PLOG06    ','CN04  ','EN01  ','PN02  ');
```

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG07   ','CN03 ','EN07 ','PN03 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG08   ','CN01 ','EN07 ','PN08 ');

Constraints for Table PROBLEMLOG

ALTER TABLE "PROBLEMLOG" MODIFY ("PROBLEMLOGNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" MODIFY ("CALLNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" MODIFY ("EQUIPMENTNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" MODIFY ("PROBLEMNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_PK" PRIMARY KEY ("PROBLEMLOGNO")

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_FK2" FOREIGN KEY ("CALLNO")

        REFERENCES "CALL" ("CALLNO") ON DELETE CASCADE ENABLE;

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_FK1" FOREIGN KEY ("EQUIPMENTNO")

        REFERENCES "HARDWAREEQUIPMENT" ("EQUIPMENTNO") ON DELETE CASCADE ENABLE;

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_FK3" FOREIGN KEY ("PROBLEMNO")

        REFERENCES "PROBLEMDESCRIPTION" ("PROBLEMNO") ON DELETE CASCADE ENABLE;

DDL for Table SKILLFIELD

```
CREATE TABLE "SKILLFIELD"

(      "SKILLFIELDID" CHAR(6 BYTE) ,

       "SKILLFIELDTYPE" CHAR(4 BYTE) ,

       "SKILLFIELDDESCRIPTION" VARCHAR2(50 BYTE)  DEFAULT 'GN',

       "NOSPECIALIST" NUMBER(2,0)

)  ;
```

COMMENT ON COLUMN "SKILLFIELD"."SKILLFIELDID" IS 'A primary key for SkillField table';

COMMENT ON COLUMN "SKILLFIELD"."SKILLFIELDTYPE" IS 'Types of skills like OS for Operating System, HW for Hardware and SW for Software and GN for General skills. ';

COMMENT ON COLUMN "SKILLFIELD"."SKILLFIELDDESCRIPTION" IS 'Description for skills. By default is general skills. ';

COMMENT ON COLUMN "SKILLFIELD"."NOSPECIALIST" IS 'Number of Specialists';

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF01 ','OS ','Operating Systems',4);

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF02 ','SW ','Software',3);

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF03 ','HW ','Hardware',3);

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF04 ','GN ','General Problems',4);

Constraints for Table SKILLFIELD

  ALTER TABLE "SKILLFIELD" ADD CONSTRAINT "SPECIALISTNOPOSITIVE" CHECK
(NoSpecialist >= 0) ENABLE;

 ALTER TABLE "SKILLFIELD" MODIFY ("SKILLFIELDID" NOT NULL ENABLE);

 ALTER TABLE "SKILLFIELD" MODIFY ("SKILLFIELDTYPE" NOT NULL ENABLE);

 ALTER TABLE "SKILLFIELD" MODIFY ("SKILLFIELDDESCRIPTION" NOT NULL
ENABLE);

 ALTER TABLE "SKILLFIELD" MODIFY ("NOSPECIALIST" NOT NULL ENABLE);

 ALTER TABLE "SKILLFIELD" ADD CONSTRAINT "SKILLFIELD_PK" PRIMARY KEY
("SKILLFIELDID");

 ALTER TABLE "SKILLFIELD" ADD CONSTRAINT "UNIQUE_SKILLFIELDTYPE" UNIQUE
("SKILLFIELDTYPE");

DDL for Table PROBLEMDESCRIPTION

```
CREATE TABLE "PROBLEMDESCRIPTION"

(     "PROBLEMNO" CHAR(6 BYTE) ,

      "PROBLEMDESCRIPTION" VARCHAR2(100 BYTE) ,

      "PROBLEMSOLUTION" VARCHAR2(100 BYTE)

) ;
```

COMMENT ON COLUMN "PROBLEMDESCRIPTION"."PROBLEMNO" IS 'A primary key for probel description';

COMMENT ON COLUMN "PROBLEMDESCRIPTION"."PROBLEMDESCRIPTION" IS 'A brief summary of the problem';

COMMENT ON COLUMN "PROBLEMDESCRIPTION"."PROBLEMSOLUTION" IS 'A brief summary of how to solve the problem';

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN01 ','MSExcell doesnot edit excell files and disable few features.','Check that client is using a licenced copy of MSExcell. Check HDD and RAM sizes. ');

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN02 ','Linux missing or non-compatiable driver','Make sure that the most up-to-date linux device driver in installed. ');

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN03 ','Windows not booting up.','Check for failed HDD, RAM or a virous. ');

Insert into PROBLEMDESCRIPTION (PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN04 ','Networking Switch is not working','Install an up to date firmware and check power and networking cables. ');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN05 ','Skype is
not working','Reinstall the new Skype app and create a microsoft account to use it.');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN06 ','Server
not starting','look for HDD, RAM, powercable or case-power button failure');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN07 ','USB
mouse is not working','Check the USB port or replace the USB key');

Insert into PROBLEMDESCRIPTION
(PROBLEMNO,PROBLEMDESCRIPTION,PROBLEMSOLUTION) values ('PN08 ','Printer
not recognised on LAN','Check network cable and port. Install the up-to-date software');

Constraints for Table PROBLEMDESCRIPTION

  ALTER TABLE "PROBLEMDESCRIPTION" ADD CONSTRAINT
"PROBLEMDESCRIPTION_UNIQUE" UNIQUE ("PROBLEMDESCRIPTION")

  ALTER TABLE "PROBLEMDESCRIPTION" MODIFY ("PROBLEMNO" NOT NULL
ENABLE);

  ALTER TABLE "PROBLEMDESCRIPTION" MODIFY ("PROBLEMDESCRIPTION" NOT
NULL ENABLE);

  ALTER TABLE "PROBLEMDESCRIPTION" MODIFY ("PROBLEMSOLUTION" NOT NULL
ENABLE);

  ALTER TABLE "PROBLEMDESCRIPTION" ADD CONSTRAINT
"PROBLEMDESCRIPTION_PK" PRIMARY KEY ("PROBLEMNO");

DDL for Table PROBLEMLOG

```
CREATE TABLE "PROBLEMLOG"

(    "PROBLEMLOGNO" CHAR(10 BYTE) ,

     "CALLNO" CHAR(6 BYTE) ,

     "EQUIPMENTNO" CHAR(6 BYTE) ,

     "PROBLEMNO" CHAR(6 BYTE)

) ;
```

COMMENT ON COLUMN "PROBLEMLOG"."PROBLEMLOGNO" IS 'A primary key for logging a problem. Multiple logs could refer to one problem.';

COMMENT ON COLUMN "PROBLEMLOG"."CALLNO" IS 'A foreign key that refers to Call(CallNO)';

COMMENT ON COLUMN "PROBLEMLOG"."EQUIPMENTNO" IS 'A foreign key that refers to HardwareEquipment(EquipmentNo)';

COMMENT ON COLUMN "PROBLEMLOG"."PROBLEMNO" IS 'A foreign key that refers to ProblemDescription(ProblemNo)';

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG01   ','CN03 ','EN01 ','PN01 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG02   ','CN03 ','EN03 ','PN06 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG04   ','CN03 ','EN07 ','PN02 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG05   ','CN08 ','EN02 ','PN05 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG06   ','CN04 ','EN01 ','PN02 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG07   ','CN03 ','EN07 ','PN03 ');

Insert into PROBLEMLOG (PROBLEMLOGNO,CALLNO,EQUIPMENTNO,PROBLEMNO) values ('PLOG08   ','CN01 ','EN07 ','PN08 ');

Constraints for Table PROBLEMLOG

ALTER TABLE "PROBLEMLOG" MODIFY ("PROBLEMLOGNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" MODIFY ("CALLNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" MODIFY ("EQUIPMENTNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" MODIFY ("PROBLEMNO" NOT NULL ENABLE);

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_PK" PRIMARY KEY ("PROBLEMLOGNO")

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_FK2" FOREIGN KEY ("CALLNO")

        REFERENCES "CALL" ("CALLNO") ON DELETE CASCADE ENABLE;

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_FK1" FOREIGN KEY ("EQUIPMENTNO")

        REFERENCES "HARDWAREEQUIPMENT" ("EQUIPMENTNO") ON DELETE CASCADE ENABLE;

ALTER TABLE "PROBLEMLOG" ADD CONSTRAINT "PROBLEMLOG_FK3" FOREIGN KEY ("PROBLEMNO")

        REFERENCES "PROBLEMDESCRIPTION" ("PROBLEMNO") ON DELETE CASCADE ENABLE;

DDL for Table SKILLFIELD

```
CREATE TABLE "SKILLFIELD"

(      "SKILLFIELDID" CHAR(6 BYTE) ,

       "SKILLFIELDTYPE" CHAR(4 BYTE) ,

       "SKILLFIELDDESCRIPTION" VARCHAR2(50 BYTE)  DEFAULT 'GN',

       "NOSPECIALIST" NUMBER(2,0)

)  ;
```

COMMENT ON COLUMN "SKILLFIELD"."SKILLFIELDID" IS 'A primary key for SkillField table';

COMMENT ON COLUMN "SKILLFIELD"."SKILLFIELDTYPE" IS 'Types of skills like OS for Operating System, HW for Hardware and SW for Software and GN for General skills. ';

COMMENT ON COLUMN "SKILLFIELD"."SKILLFIELDDESCRIPTION" IS 'Description for skills. By default is general skills. ';

COMMENT ON COLUMN "SKILLFIELD"."NOSPECIALIST" IS 'Number of Specialists';

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF01 ','OS ','Operating Systems',4);

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF02 ','SW ','Software',3);

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF03 ','HW ','Hardware',3);

Insert into SKILLFIELD
(SKILLFIELDID,SKILLFIELDTYPE,SKILLFIELDDESCRIPTION,NOSPECIALIST) values
('SF04 ','GN ','General Problems',4);

Constraints for Table SKILLFIELD

 ALTER TABLE "SKILLFIELD" ADD CONSTRAINT "SPECIALISTNOPOSITIVE" CHECK
(NoSpecialist >= 0) ENABLE;

 ALTER TABLE "SKILLFIELD" MODIFY ("SKILLFIELDID" NOT NULL ENABLE);

 ALTER TABLE "SKILLFIELD" MODIFY ("SKILLFIELDTYPE" NOT NULL ENABLE);

 ALTER TABLE "SKILLFIELD" MODIFY ("SKILLFIELDDESCRIPTION" NOT NULL
ENABLE);

 ALTER TABLE "SKILLFIELD" MODIFY ("NOSPECIALIST" NOT NULL ENABLE);

 ALTER TABLE "SKILLFIELD" ADD CONSTRAINT "SKILLFIELD_PK" PRIMARY KEY
("SKILLFIELDID")

 ALTER TABLE "SKILLFIELD" ADD CONSTRAINT "UNIQUE_SKILLFIELDTYPE" UNIQUE
("SKILLFIELDTYPE");

Task 4 – Database Test

1. List the details of equipment and associated software

SELECT HE.EQUIPMENTDESCRIPTION EQUIPMENT_NAME, HE.EQUIPMENTTYPE EQUIPMENT_TYPE, ST.SOFTWARENAME SOFTWARE_DETAILS

FROM HARDWAREEQUIPMENT HE JOIN SOFTWARE ST

ON (HE.SOFTWARELICENCENO =ST.SOFTWARELICENCENO);

	EQUIPMENT_NAME	EQUIPMENT_TYPE	SOFTWARE_DETAILS
1	HDD, SSD, CD and USB pen	Storage Media	USB Driver
2	Scanners with OCR	Imaging Devices	USB Driver
3	Hub, Router and Switches	Networing Devices	EthernetCom
4	Laptop, palmtop and tablets	Mobile Devices	OCR Scanner
5	keyboards, mice and cases	Accessories	Mouse
6	Desktop PCs and MACs	Computer	MSExcell
7	Stand-alone and network printers	Printers	WifiSmart

2. Produce a list of experts (support staff) for a given problem area

SELECT STAFFFIRSTNAME FIRSTNAME, STAFFLASTNAME LASTNAME, SKILLFIELDDESCRIPTION SKILL_FIELD

FROM ITSTAFF JOIN SKILLFIELD

ON (ITSTAFF.SKILLFIELDID = SKILLFIELD.SKILLFIELDID)

ORDER BY SKILLFIELD.SKILLFIELDTYPE;

	FIRSTNAME	LASTNAME	SKILL_FIELD
1	Clare	Hudson	General Problems
2	Sakdeep	Chauhan	General Problems
3	Leo	Zaki	General Problems
4	Steve	Nelson	Hardware
5	Nithu	Patel	Hardware
6	Jimmy	Nel	Operating Systems
7	Jim	Correy	Operating Systems
8	Francis	Enabeli	Operating Systems
9	Anwar	Islam	Software
10	Kim	Taylor	Software

3. Produce a list of all unresolved problems with the assigned Specialist

SELECT DISTINCT PD.PROBLEMDESCRIPTION PROBLEM_NOT_RESOLVED,

ISF.STAFFFIRSTNAME LAST_ASSIGNED_STAFF_FIRSTNAME, ISF.STAFFLASTNAME LAST_ASSIGNED_STAFF_LASTNAME

FROM ALLOCATIONRESOLVELOG AG, PROBLEMLOG PG, PROBLEMDESCRIPTION PD, CALL CAL, ITSTAFF ISF

WHERE AG.PROBLEMLOGNO = PG.PROBLEMLOGNO

AND PG.PROBLEMNO = PD.PROBLEMNO

AND AG.PROBLEMSTATUS = 'NOTRESOLVED'

AND ISF.STAFFID = AG.THIRDALLOCATEDSTAFF;

	PROBLEM_NOT_RESOLVED	LAST_ASSIGNED_STAFF_FIRSTNAME	LAST_ASSIGNED_STAFF_LASTNAME
1	Printer not recognised on LAN	Francis	Enabeli
2	MSExcell doesnot edit excell files and disable few features.	Nithu	Patel

4. Produce a list of problems reported by a member of staff, the details of the support staff who attended the problem and the solution provided by the support staff

SELECT DISTINCT PD.PROBLEMDESCRIPTION RESOLVED_PROBLEM,

ISF.STAFFFIRSTNAME SUPPORT_STAFF_FIRSTNAME,

ISF.STAFFLASTNAME SUPPORT_STAFF_LASTNAME,

AG.PROBLEMRESOLVEDDETAILS

FROM ALLOCATIONRESOLVELOG AG, PROBLEMLOG PG, PROBLEMDESCRIPTION PD, CALL CAL, ITSTAFF ISF

WHERE AG.PROBLEMLOGNO = PG.PROBLEMLOGNO

AND PG.PROBLEMNO = PD.PROBLEMNO

AND AG.PROBLEMSTATUS = 'RESOLVED'

AND ISF.STAFFID = AG.PROBLEMALLOCATEDBY;

RESOLVED_PROBLEM	SUPPORT_...	SUPPORT_S...	PROBLEMRESOLVEDDETAILS
1 Linux missing or non-compatiable driver	Leo	Zaki	By installing an up-to-date printer driver.
2 Skype is not working	Sakdeep	Chauhan	Use a different USB dongle for the wireless mouse.
3 Server not starting	Sakdeep	Chauhan	Replacement of faculty motherboard,HDD and powersupply.
4 Linux missing or non-compatiable driver	Clare	Hudson	Reset hub to factory setting.
5 Networking Switch is not working	Clare	Hudson	Printer was replaced due to internal fault
6 Windows not booting up.	Leo	Zaki	Repair corrupted window and upgrade Malware.

5. Find (display) the average time taken fix fault for a given problem area.

SELECT ROUND(AVG(PROBLEMRESOLVEDTIME),2)
AVERAGE_RESOLVE_TIME_IN_DAYS FROM ALLOCATIONRESOLVELOG;

AVERAGE_RESOLVE_TIME_IN_DAYS
1   6

6. Display a list of the most common problems and order them in according to the frequency of their occurrence.

SELECT DISTINCT PD.PROBLEMDESCRIPTION, COUNT(AG.PROBLEMOCCURINGLOGNO) FREQUENCY

FROM ALLOCATIONRESOLVELOG AG, PROBLEMLOG PG, PROBLEMDESCRIPTION PD

WHERE AG.PROBLEMOCCURINGLOGNO = PG.PROBLEMLOGNO

AND PG.PROBLEMNO = PD.PROBLEMNO

GROUP BY PD.PROBLEMDESCRIPTION

ORDER BY FREQUENCY DESC;

	PROBLEMDESCRIPTION	FREQUENCY
1	Networking Switch is not working	3
2	Printer not recognised on LAN	2
3	Server not starting	2
4	Windows not booting up.	1

7. Display the equipment with the most reported problems showing problem details

SELECT HD.EQUIPMENTDESCRIPTION, PD.PROBLEMDESCRIPTION

FROM PROBLEMLOG PG, PROBLEMDESCRIPTION PD, HARDWAREEQUIPMENT HD

WHERE PD.PROBLEMDESCRIPTION = 'NETWORKING SWITCH IS NOT WORKING'

AND PD.PROBLEMNO = PG.PROBLEMNO

AND PG.EQUIPMENTNO = HD.EQUIPMENTNO;

	EQUIPMENTDESCRIPTION	PROBLEMDESCRIPTION
1	Hub, Router and Switches	Networking Switch is not working

8. Produce a list of problems that have been solved by helpdesk operator

SELECT * FROM ITSTAFF ORDER BY JOBTITLE;

/* STAFF IDS OF HELPDESK OPERATORS ARE, ST04, ST07 AND ST10 */

SELECT PD.PROBLEMDESCRIPTION PROBLEM_DISCRIPTION, ITF.STAFFFIRSTNAME HELPDESK_OPERATOR_FIRSTNAME,

ITF.STAFFLASTNAME HELPDESK_OPERATOR_LASTNAME

FROM ALLOCATIONRESOLVELOG AG, PROBLEMLOG PG, PROBLEMDESCRIPTION PD, CALL CAL, ITSTAFF ITF

WHERE AG.FIRSTALLOCATEDSTAFFID IN ('ST04', 'ST07', 'ST10')

AND AG.PROBLEMLOGNO = PG.PROBLEMLOGNO

AND PG.PROBLEMNO = PD.PROBLEMNO

AND PG.CALLNO = CAL.CALLNO

AND CAL.STAFFID = ITF.STAFFID;

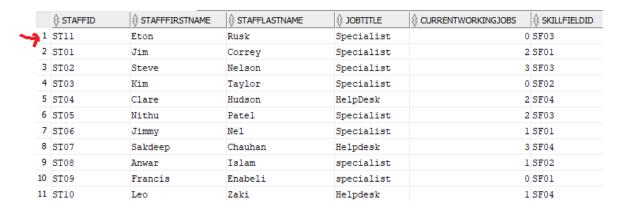| PROBLEM_DISCRIPTION	HELPDESK_OPERATOR_FIRSTNAME	HELPDESK_OPERATOR_LASTNAME
1 Printer not recognised on LAN	Leo	Zaki
2 Server not starting	Steve	Nelson
3 Linux missing or non-compatiable driver	Steve	Nelson

9. Add a new Specialist to the database

INSERT INTO ITSTAFF

(STAFFID,STAFFFIRSTNAME,STAFFLASTNAME,JOBTITLE,CURRENTWORKINGJOBS,

SKILLFIELDID)

VALUES ('ST11 ','ETON','RUSK','SPECIALIST',0,'SF03');

	STAFFID	STAFFFIRSTNAME	STAFFLASTNAME	JOBTITLE	CURRENTWORKINGJOBS	SKILLFIELDID
1	ST11	Eton	Rusk	Specialist	0	SF03
2	ST01	Jim	Correy	Specialist	2	SF01
3	ST02	Steve	Nelson	Specialist	3	SF03
4	ST03	Kim	Taylor	Specialist	0	SF02
5	ST04	Clare	Hudson	HelpDesk	2	SF04
6	ST05	Nithu	Patel	Specialist	2	SF03
7	ST06	Jimmy	Nel	Specialist	1	SF01
8	ST07	Sakdeep	Chauhan	Helpdesk	3	SF04
9	ST08	Anwar	Islam	specialist	1	SF02
10	ST09	Francis	Enabeli	specialist	0	SF01
11	ST10	Leo	Zaki	Helpdesk	1	SF04

10. Assign a specialist for a given problem (it must be an unresolved, unassigned and should find a matching Specialist)

UPDATE ALLOCATIONRESOLVELOG SET THIRDALLOCATEDSTAFF = 'ST11'

WHERE PROBLEMSTATUS = 'NOTRESOLVED'

AND PROBLEMRESOLVEDDATE IS NULL

AND PROBLEMRESOLVEDDETAILS = 'NA';

	PROBLEMA...	PRO...	PROBLEMLOG...	PROBLEMO...	PROBLE...	FIRST...	SECO...	THIRDALLOCATEDSTAFF	PROBLEMSTATUS	
1	PALL01	1	PLOG04	PLOG03	ST10	ST10	NA	NA	RESOLVED	0
2	PALL02	2	PLOG05	PLOG02	ST07	ST02	NA	NA	RESOLVED	1
3	PALL03	0	PLOG01	PLOG08	ST04	ST03	ST05	ST11	NOTRESOLVED	0
4	PALL04	4	PLOG07	PLOG03	ST10	ST01	ST09	NA	RESOLVED	0
5	PALL05	2	PLOG06	PLOG02	ST04	ST06	ST09	NA	RESOLVED	2
6	PALL06	11	PLOG08	PLOG07	ST04	ST07	ST09	ST11	NOTRESOLVED	0
7	PALL07	4	PLOG03	PLOG08	ST04	ST08	ST03	NA	RESOLVED	0
8	PALL08	24	PLOG02	PLOG03	ST07	ST07	NA	NA	RESOLVED	0

11. Update the Call-log with appropriate details when the problem has been resolved.

UPDATE ALLOCATIONRESOLVELOG

SET PROBLEMRESOLVEDDETAILS = 'BY REPLACING CABLES AND FAULTY SWITCH',

  PROBLEMRESOLVEDDATE = SYSDATE

WHERE PROBLEMSTATUS = 'NOTRESOLVED';

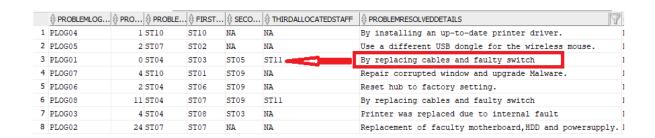|	PROBLEMLOG...	PRO...	PROBLE...	FIRST...	SECO...	THIRDALLOCATEDSTAFF	PROBLEMRESOLVEDDETAILS	
1	PLOG04	1	ST10	ST10	NA	NA	By installing an up-to-date printer driver.	1
2	PLOG05	2	ST07	ST02	NA	NA	Use a different USB dongle for the wireless mouse.	1
3	PLOG01	0	ST04	ST03	ST05	ST11	By replacing cables and faulty switch	1
4	PLOG07	4	ST10	ST01	ST09	NA	Repair corrupted window and upgrade Malware.	1
5	PLOG06	2	ST04	ST06	ST09	NA	Reset hub to factory setting.	1
6	PLOG08	11	ST04	ST07	ST09	ST11	By replacing cables and faulty switch	1
7	PLOG03	4	ST04	ST08	ST03	NA	Printer was replaced due to internal fault	1
8	PLOG02	24	ST07	ST07	NA	NA	Replacement of faculty motherboard,HDD and powersupply.	1

12. An item of Equipment which, has previously had a fault reported, has now become redundant so Delete it from the database

DELETE FROM HARDWAREEQUIPMENT

WHERE EQUIPMENTNO = 'EN06'

AND EQUIPMENTMAKE = 'PQR';

Before deleting faulty equipment no EN06 which is networking device

	EQUIPMENTNO	EQUIPMENTTYPE	EQUIPME...	OSLICENC...	SOFTWARELIC...	EQUIPMENTDESCRIPTION
1	EN01	Computer	ABC	OS3	SL09	Desktop PCs and MACs
2	EN02	Mobile Devices	DEF	OS1	SL05	Laptop, palmtop and tablets
3	EN03	Accessories	DEF	OS2	SL06	keyboards, mice and cases
4	EN04	Printers	ABC	OS5	SL10	Stand-alone and network pr...
5	EN05	Storage Media	PQR	OS4	SL01	HDD, SSD, CD and USB pen
6	EN06	Networing Devices	PQR	OS1	SL03	Hub, Router and Switches
7	EN07	Imaging Devices	XYZ	OS3	SL01	Scanners with OCR

After Deleting

	EQUIPMENTNO	EQUIPMENTTYPE	EQUIPMENTMAKE	OSLICENC...	SOFTWARELIC...	EQUIPMENTDESCRIPTION
1	EN01	Computer	ABC	OS3	SL09	Desktop PCs and MACs
2	EN02	Mobile Devices	DEF	OS1	SL05	Laptop, palmtop and tablets
3	EN03	Accessories	ABC	OS2	SL06	keyboards, mice and cases
4	EN04	Printers	ABC	OS5	SL10	Stand-alone and network pr...
5	EN05	Storage Media	PQR	OS4	SL01	HDD, SSD, CD and USB pen
6	EN07	Imaging Devices	XYZ	OS3	SL01	Scanners with OCR