**SIT 103 – DATA AND INFORMATION MANAGEMENT**

**ASSESSMENT TASK 2**

**PART 2**

**DATABASE DESIGN, IMPLEMENTATION, AND INTERACTION**

**REPORTED BY**

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# Business Scenario:

Budha Group of Institutions offers educational services in form of courses and events in seven different streams through four of its branches (BCE, BCA, BCM and BCHE) and campuses around Karnal. The four colleges offer a total of 9 different courses with specialisation in 6 different fields. BCE offers B.Ed. and D.El.Ed, BCA offers B.Arch., BCM offers MBA, BBA and BCHE offers B.Sc. (Fashion Design, Interior Design), B.Com. and BFA. Every course has its own duration, fees, requirements, students, placement ratings, eligibility etc. Each course is specialised in one of the six (Fashion Design, Finance, Human Resources, International Business, IT & Systems, and Sales & Marketing) specialisations. Each branch, or campus has two types of employees: Management staff or teaching staff. There is a Head of Department for each specialisation field who updates the contents and manages the professors of his department. Each branch offers services like Gym, Yoga, Cafeteria, Library and Sports facilities for students only.

Each Head of Department can employee Professors, and Assistant Professors as teaching staff. Each professor can hire one intern at most. Each professor gets one lecture a day and a lecture take place even if there is a single student but cancelled if there is zero attendance. Each student can be taught by different professors, but one teacher can teach only one subject. Every intern report to assistant professor, who in turn reports to main professor, who reports to the head of the department, who reports to the principal, who finally reports to the managing director. There is a finance department that prepares budget for each department and reports every month to the managing director. Finance reports contains monthly budgets, turn-over, profits, losses, assets, liabilities, pending payments, etc. It receives reports from accounts, reception, events, and marketing departments.

Accounts department reports to finance department every month. It keeps the total record of , scholarships provided, maintenance costs, advertisement, admission expenses, bank charges, telephone expenses, inspection charges, travelling expenses, staff wages and employee salaries, miscellaneous, university charges, events and special lectures expenses, student, and employee tours costs, etc. It receives fees from the students and also pays wages to the employees into their bank accounts. Students can pay fee as cash, through a card, or a valid cheque, but no other modes of payment are allowed. Account department is responsible for providing scholarships and hostels if available. Each college branch has a hostel, separate for boys and girls, a student has the choice to take a room and can choose from single, double, and three-bed room set.

Each college in the organization also has a reception to attend visitors, students and give them details. This department accepts student application forms, record applicant’s data, frequently contact applicants for updates, solve any existing student issues, reply to enquiries, daily needs and requests from students and other staffs and generate monthly reports. The applications are sent to the administration. The administration department rejects or interviews a student and final status is updated to reception. The applicants receive all the confirmations by email from reception and also any further details after admission. The admin stores the student’s data and status for current as well as old students. It updates receptions about the new events and notices. Admin also keeps the record of all the employees and staff, chairman and directors. Admin department will also update the website timely and record the data for last time it was updated.

Another important department is the Marketing department, which takes care of advertising colleges through pamphlets and news, increasing publicity. They socialise through social media platforms and other means to promote the institution and the final report is given to the finance department by them every month. The marketing department also reports to the director of marketing, who reports to the Chairman. There is also an events department that organises all the events related to academics as well as co-curricular. They will be storing name, venue, date, timings, and the participants of the event. The monthly reports will go to finance department again to prepare a budget and accommodate all the expenses. The Chairman is the highest authority and is reported by the managing directors and marketing director with combined reports from finance department and marketing department respectively.

# LIST OF ENTITIES:

1. **EMPLOYEES** [ Emp Id (PK), Emp Name (PK), Emp DOB, Emp Address, Emp Contact, Emp Job Status, Emp Joining Date, Emp Type]

Employee is considered as an entity so that all the data related to employees can be stored in a table. According to business scenario, employee is an important element as it includes teachers and management. It is a supertype because of different Emp Type and its subtypes are Teaching Staff and Management Staff.

1. **TEACHING STAFF** [ Emp Id (PK, FK), Emp Name (PK, FK), Emp Designation, Working Tenure]

It has been chosen as an entity to store the data for all the employees that teach, including their designations specifically. It is a supertype of three types of teaching staff, i.e., professors, assistant professors, and interns.

1. **MANAGEMENT STAFF** [ Emp Id (PK, FK), Emp Name (FK), Emp Department, Working Tenure, Emp Salary, Emp Designation, Salary Increment]

It is a completely different entity because it represents a type of employees that work in the colleges but are not teachers. It is essential to record their details for salary payments, contact and other things.

1. **PROFESSOR** [ Emp Id (PK, FK), Emp Name (PK, FK), Department Name (FK), Lecture Name (FK), Emp Salary, Quarterly Increment, Number of Assistant Professors]

One of the designations in teaching staff, who reports to the head of department but also trains an intern. Professors are reported by Assistant professors but give only one lecture in a particular subject daily. It is important to store the details of a professor to know their schedule, personal details, and everything.

1. **ASSISTANT PROFESSOR** [ Emp Id (PK, FK), Emp Name (PK, FK), Department Name (FK), Reports to Professor Id (FK), Emp Salary, Yearly Increment]

A designation below Professors, who takes all the reports of the interns and works in a specific department. They get salary and increments, and are an important entity so that their records can be kept separately for their tenure, personal details, head professor, etc.

1. **INTERN** [ Emp Id (PK, FK), Emp Name (PK, FK), Emp Salary, Department Name (FK), Reports to Assistant Professor Id (FK)]

These are the newbies but paid ones. They work under professors and assistant professors. Their details are important to be kept as a separate entity for when required and also to make their identities, certificates and assign them professors, departments, etc.

1. **HEAD OF DEPARTMENT** [ Emp Id (PK), Emp Name, Department Name (PK, FK), Working Tenure, Emp Salary, Quarterly Increment, Number of Professors Reporting]

Every department needs a head to manage everything, when teachers are busy tutoring, so HOD manages all the professors, department needs and get paid along with increments, so, it is important for such officials to have a separate table for records, which becomes quite easy to find when needed.

1. **PRINCIPAL** [P Name (PK), P DOB, P Contact, Working Tenure]

To manage every college, there is a highly qualified principal, whose details must be kept by the institution like any other employee for incentives, trips, awards, cases, payments, etc.

1. **SPECIALISATION/ DEPARTMENT** [ Department Name (PK), Department Code, Number of Courses]

Because there are many different departments, we need a separate table that would store all the details of these departments. Now, addition of courses in department, removal of courses, or addition/ removal of new/ old departments will not affect the stored records reducing the chances of data inconsistencies.

1. **LECTURES** [Lect Name (PK), Lect Duration, Lect Timings]

Professor gives lectures and students attend them but there are numerous lectures and for students and professors to get aware of them, it is first necessary to store their details as a separate entity without any confusions.

1. **STUDENTS** [ Stud Id (PK), Stud Full Name, Stud DOB, Stud Address, Stud Course Name (FK), Stud Accommodation Type, Stud Contact, Stud Emergency Number]

One of the most important entity in an educational institution, which would record the details of all the students it teaches.

1. **STUDENT-LECTURES** [ Lect Name (PK, FK1), Stud Id (PK, FK2)]

It is an associative-entity to implement the many-many relationships between students and lectures. A student attends many lectures, and a lecture has different students, but to know exactly which lecture has which student, this entity is important one.

1. **COURSES** [Course Name (PK), Specialisation Name (FK), Branch Name (FK), Fees, Duration, Placement Ratings, Eligibility]

There are different courses provided by the university, but for a student to choose and university to improve, there must be details of the courses that already are offered by the university, so that any changes made to this data do not affect other records in any entity.

1. **BRANCHES** [ Branch Name (PK), Location, Principal Name (FK), Number of Courses]

This group has four different colleges, this entity keeps them connected by keeping the records of all of them. These details kept in a separate entity are modifiable and important for people to know.

1. **SERVICES** [ Service Name (PK), Monthly Charges, Availability Hours, Additional Comments]

Each branch provides some services, but they are a part of the institution, and all the profits or losses are included, so it becomes important to keep a record of them.

1. **BRANCH-SERVICE** [ Branch Name (PK, FK1), Service Name (PK, FK2)]

This is another associative entity also called bridge entity. It is used to implement the many-many relationships between the services provided by different branches. It keeps a record of exactly what service is provided by which branch or college.

1. **HOSTEL** [ Month Year (PK), Hostel Number (PK), Number of Rooms Available, Room Type, Fee per Room]

For those students, who are willing to take the hostel, database must keep records of every hostel available with desired rooms. This can be easily updated in case of construction or renovations.

1. **ACCOUNTS DEPARTMENT** [ Month Year (PK), Report Id (PK), Scholarships, Expenses, Service Charges, Event Tour Costs, Salaries Paid, Fee Received]

It is an important department of the university and thus, it must have an extra entity to store all the accounts- related information of the college.

1. **RECEPTION** [ Month Year (PK), Report Id (PK), Number of Applicants, Number of Enquiries, Number of Notices]

Every building has a reception that needs to store lots of data daily, so a separate entity is a requirement here.

1. **APPLICANT’S DATA** [ Applicant Number (PK), Applicant Full Name, Applicant Address, Applicant DOB, Applicant Contact, Applicant Course, Applicant Qualifications, Date of Applying]

Another important entity of an educational institution is to keep records of those who apply, so that they can be admitted, rejected, provided scholarships, hostels, take payments etc.

1. **ADMIN** [ Month Year (PK), Interviews Taken, New Admissions, Rejected Applications, Last Website Update]

Main block of a group, admin stores all the information that is very important safely.

1. **EVENTS DEPARTMENT** [ Month Year (PK), Report Id (PK), Academic Events, Extra Events, Total Costs]

This university organises many events frequently, therefore it needs to store the details of past, current as well as future events under this table.

1. **MARKETING DEPARTMENT** [ Month Year (PK), Report Id (PK), Advertising Costs, Advertising Profits]

Another important department of college that stores all the details of money and resources spent o marketing and if it is beneficial.

1. **MONTHLY REPORTS** [ Month Year (PK), Finance Report Id (PK, FK1), Events Report Id (PK, FK2), Accounts Report Id (PK, FK3), Marketing Report Id (PK, FK4), Reception Report Id (PK, FK5)]

This is a crucial entity for analysis of smooth working of the organisation. It can be checked by any department to know budgets, profits, losses and especially by directors and Chairman to avoid any fraudulent activities that may happen.

1. **FINANCE DEPARTMENT** [ Month Year (PK), Report Id (PK), Turn-Over, Pending Payment, Liabilities, Assets, Taxes, Equity]

The most important department to prepare all the budgets by collecting all the reports from different departments. It keeps records of all the assets, liabilities and other things for the university making it better to manage for the directors and chairman.

1. **DIRECTORS** [ Director Initials (PK), Director Name(PK), Working Tenure, Income, Reported by (FK), Director Type]

They are the second highest authority to manage the functionality and maintain quality, but their records must be kept and open to all for fair working and no scams.

1. **CHAIRMAN** [ CM Initials (PK), CM Name (PK), CM DOB, CM Address, CM Contact Number]

He owns the institution and there is only one at a time, so to keep the record of chain of chairmen over the years, it is important for this entity to exist.

# NORMALISATION:

1. **EMPLOYEES**

Intersection of every row and column gives a unique value, that means the table is already in first Normal form.

There are no partial dependencies as all those things that are dependent on Emp Id are also dependent on Emp Name. Also, Emp Id is dependent on Emp Name. Thus, the table is also in 2NF.

Because all the attributes other than primary key are related to primary key and not to each other, this means that the table is normalised till level 3 and there are no partial dependencies.

1. **TEACHING STAFF**

There is only one value per cell, which is unique and also Emp Id + Emp Name is defined as primary key. This means table is normalised in 1NF.

None of the non-key attribute partially depends on primary key attributes, therefore 2NF is satisfied.

Working Tenure and Designation are both related to Employee Name and Id. None of them is related to each other, i.e., there is no transitive dependency, so 3NF is satisfied.

1. **MANAGEMENT STAFF**

All the records are unique with a defined primary key, so there is no need to normalise at level 1.

There is only one primary key, which moves us to third level directly.

In third level, we look for transitive dependencies and there is one between Emp Designation and Salary and Salary Increments because Designation decides salary and salary decides increments. So, we form a separate entity for these attributes with Emp Designation in both, but as primary key in new entity.

1. **PROFESSOR**

All the attributes will contain a single record without any repeating groups. Also, there is a primary key, which means that it satisfies 1NF.

Emp Id and Name are themselves dependent on each other so there are no partial dependencies, i.e., 2NF is also satisfied.

All the attributes are related to the employ but none to each other, leaving zero chance of any transitive dependency. So, it is normalised till 3NF.

1. **ASSISTANT PROFESSOR**

All the entries are unique with a composite primary key, but the attributes in the hey are themselves dependent on each other, that means there is no chance of partial dependency. So, the table satisfies 1NF and 2NF. As there are no transitive dependencies in attributes: Department Name, Professor Id, Salary and Fixed Increment, it is automatically normalised up to 3NF.

1. **INTERN**

It is normalised up to 3NF, same as it was for Assistant Professor.

1. **HEAD OF DEPARTMENT**

All the attributes are unique with a composite primary key – 1NF.

No partial dependencies – 2NF.

No transitive dependencies – 3NF.

1. **PRINCIPAL**

All the attributes are unique with a composite primary key – 1NF.

Only one Primary key – 2NF.

No transitive dependencies, all depend on Primary Key – 3NF.

1. **SPECIALISATION/ DEPARTMENT**

Unique, non-repeating values with one Primary key – 1 & 2NF.

No transitive relation between Department Code and Number of Courses, so 3NF is also satisfied.

1. **LECTURES**

Unique, non-repeating values with one Primary key – 1 & 2NF.

Lecture Duration and Timings are dependent on each other but also on lecture name, so it is already normalised till 3NF.

1. **STUDENTS**

Unique, non-repeating values with one Primary key – 1 & 2NF.

No transitive dependencies as all the data depends on the student and Stud Id is the primary key. – 3NF

1. **STUDENT-LECTURES**

No attribute other than primary key, so unique records and leaves no chance of partial or transitional dependencies to occur. – 1, 2 & 3NF

1. **COURSES**

Unique, non-repeating values with one Primary key – 1 & 2NF.

Details related to the course can be retrieved by just course name so there is no significance of any transitive dependency here, so it is already normalised in 3rd form.

1. **BRANCHES**

Unique, non-repeating values with one Primary key – 1 & 2NF.

Principal’s name, location and number of courses offered are not related to each other but the name of the branch that shows there are no signs of transitive dependencies. – 3NF

1. **SERVICES**

Unique, non-repeating values with one Primary key – 1 & 2NF.

Charges are independent of hours and comments are meant for the service, so no transitive dependency – 3NF satisfied.

1. **BRANCH-SERVICE**

No attribute other than primary key, so unique records and leaves no chance of partial or transitional dependencies to occur. – 1, 2 & 3NF

1. **HOSTEL**

Unique, non-repeating values with defined Primary key – 1 NF.

Time of the year and the quality of the building decides the availability of particular type of room and charges are not fixed. So, no partial dependency. – 2NF  
No transitive dependencies – 3NF

1. **ACCOUNTS DEPARTMENT**

All the attributes are unique with a composite primary key – 1NF.

Different expenses can only be mentioned in a report, and they surely will vary with month, so there is complete dependency only – 2NF satisfied

No transitive dependencies – 3NF

1. **RECEPTION**

All the attributes are unique with a composite primary key – 1NF.

Applications, Enquiries and Notices are part of a report and vary monthly, so there are no partial dependencies. 2NF satisfied

No dependent-determinant relation between attributes other than key so no transitive dependency – 3NF satisfied.

1. **APPLICANT’S DATA**

Unique, non-repeating values with one Primary key – 1 & 2NF.

No transitive dependencies as all the data depends on the Applicant and Application Number is the primary key. – 3NF

1. **ADMIN**

Unique, non-repeating values with one Primary key – 1 & 2NF.

Completely different information in rest of the attributes so no chance of existence of transitional dependencies. – 3NF

1. **EVENTS DEPARTMENT**

All the attributes are unique with a composite primary key – 1NF.

Report varies every month and changes are visible in combined report represented by Report Id, so no partial but only complete dependencies exist. – 2NF satisfied.

No transitive dependencies – 3NF

1. **MARKETING DEPARTMENT**

All the attributes are unique with a composite primary key – 1NF.

Report varies every month and changes are visible in combined report represented by Report Id, so no partial but only complete dependencies exist. – 2NF satisfied.

No transitive dependencies – 3NF

1. **MONTHLY REPORTS**

All the attributes are unique with a composite primary key – 1NF.

Report varies every month and changes are visible in combined report represented by Report Id, so no partial but only complete dependencies exist. – 2NF satisfied.

No transitive dependencies – 3NF

1. **FINANCE DEPARTMENT**

All the attributes are unique with a composite primary key – 1NF.

Report varies every month and changes are visible in combined report represented by Report Id, so no partial but only complete dependencies exist. – 2NF satisfied.

No transitive dependencies – 3NF

1. **DIRECTORS**

Unique values with unique primary key composed of Name and the initials. – 1NF

All the attributes depend on both parts of the key because attributes of the key are dependent. – 2NF

No transitive dependency among Director’s details. -3NF

1. **CHAIRMAN**

Unique values with unique primary key – 1NF

All the attributes depend on both parts of the key because attributes of the key are dependent. – 2NF

No transitive dependency among Chairman’s details. -3NF

# ENTITY RELATIONSHIP DIAGRAM (ERD):

Diagram, schematic

Description automatically generated

# IMPLEMENTATION OF THE DATABASE SCHEMA:

/\* Introduction to SQL                  \*/

/\* Script file for ORACLE  DBMS             \*/

/\* Script file loads all 28 tables              \*/

CREATE TABLE DEPARTMENT (

DEPARTMENT\_NAME     VARCHAR2(35) NOT NULL CHECK(DEPARTMENT\_NAME IN ('FASHION DESIGN', 'FINANCE', 'HUMAN RESOURCES', 'INTERNATIONAL BUSINESS', 'IT', 'SALES AND MARKETING')),

DEPARTMENT\_CODE     CHAR(4) NOT NULL CHECK(DEPARTMENT\_CODE IN ('FD01', 'FN02', 'HR03', 'IB04', 'IT05', 'SM06')),

NUM\_COURSES         INTEGER NOT NULL,

PRIMARY KEY (DEPARTMENT\_NAME));

CREATE TABLE EMPLOYEES (

EMP\_ID              VARCHAR2(10) NOT NULL,

EMP\_NAME            VARCHAR2(35) NOT NULL,

EMP\_DOB             DATE NOT NULL,

EMP\_ADDRESS         VARCHAR2(40) NOT NULL,

EMP\_CONTACT         CHAR(10) NOT NULL,

EMP\_JOB\_STATUS      VARCHAR2(25) NOT NULL CHECK(EMP\_JOB\_STATUS IN ('WORKING', 'ON LEAVE', 'NO SHIFT', 'OLD EMPLOYEE')),

EMP\_JOINING\_DATE    DATE NOT NULL,

EMP\_TYPE            VARCHAR2(20) NOT NULL,

PRIMARY KEY (EMP\_ID, EMP\_NAME),

CONSTRAINT EMP\_ID\_U1 UNIQUE(EMP\_ID));

CREATE TABLE MANAGEMENT\_STAFF (

EMP\_ID              VARCHAR2(10) NOT NULL,

EMP\_NAME            VARCHAR2(35) NOT NULL,

EMP\_DEPARTMENT      VARCHAR2(35) NOT NULL,

WORKING\_TENURE      VARCHAR2(15) NOT NULL,

EMP\_DESIGNATION     VARCHAR2(20) NOT NULL,

PRIMARY KEY (EMP\_ID, EMP\_DESIGNATION),

CONSTRAINT EMP\_DES UNIQUE(EMP\_DESIGNATION),

FOREIGN KEY (EMP\_ID, EMP\_NAME) REFERENCES EMPLOYEES(EMP\_ID, EMP\_NAME) ON DELETE SET NULL);

CREATE TABLE DESIGNATION (

EMP\_DESIGNATION             VARCHAR2(20) NOT NULL,

EMP\_SALARY                  INTEGER NOT NULL,

SALARY\_INCREMENT            INTEGER,

PRIMARY KEY (EMP\_DESIGNATION),

FOREIGN KEY (EMP\_DESIGNATION) REFERENCES MANAGEMENT\_STAFF(EMP\_DESIGNATION) ON DELETE SET NULL);

CREATE TABLE TEACHING\_STAFF (

EMP\_ID              VARCHAR2(10) NOT NULL,

EMP\_NAME            VARCHAR2(35) NOT NULL,

WORKING\_TENURE      VARCHAR2(15) NOT NULL,

EMP\_DESIGNATION     VARCHAR2(20) NOT NULL CHECK(EMP\_DESIGNATION IN ('PROFESSOR', 'ASSISTANT PROFESSOR', 'INTERN')),

PRIMARY KEY (EMP\_ID, EMP\_NAME),

FOREIGN KEY (EMP\_ID, EMP\_NAME) REFERENCES EMPLOYEES(EMP\_ID, EMP\_NAME) ON DELETE SET NULL);

CREATE TABLE LECTURES (

LECT\_NAME           VARCHAR2(35) NOT NULL,

LECT\_DURATION       INTEGER,

LECT\_TIMINGS        VARCHAR2(20),

PRIMARY KEY (LECT\_NAME));

CREATE TABLE PROFESSOR (

EMP\_ID              VARCHAR2(10) NOT NULL,

EMP\_NAME            VARCHAR2(35) NOT NULL,

DEPARTMENT\_NAME     VARCHAR2(35) NOT NULL CHECK(DEPARTMENT\_NAME IN ('FASHION DESIGN', 'FINANCE', 'HUMAN RESOURCES', 'INTERNATIONAL BUSINESS', 'IT', 'SALES AND MARKETING')),

LECTURE\_NAME        VARCHAR2(35) NOT NULL,

NUM\_ASST\_PROF       INTEGER NOT NULL,

EMP\_SALARY          INTEGER NOT NULL,

QUARTERLY\_INCREMENT INTEGER,

PRIMARY KEY (EMP\_ID, EMP\_NAME),

FOREIGN KEY (EMP\_ID, EMP\_NAME) REFERENCES TEACHING\_STAFF(EMP\_ID, EMP\_NAME) ON DELETE SET NULL,

CONSTRAINT PROF\_ID UNIQUE(EMP\_ID),

FOREIGN KEY (DEPARTMENT\_NAME) REFERENCES DEPARTMENT(DEPARTMENT\_NAME) ON DELETE SET NULL,

FOREIGN KEY (LECTURE\_NAME) REFERENCES LECTURES(LECT\_NAME) ON DELETE SET NULL);

CREATE TABLE ASSISTANT\_PROFESSOR (

EMP\_ID              VARCHAR2(10) NOT NULL,

EMP\_NAME            VARCHAR2(35) NOT NULL,

DEPARTMENT\_NAME     VARCHAR2(35) NOT NULL CHECK(DEPARTMENT\_NAME IN ('FASHION DESIGN', 'FINANCE', 'HUMAN RESOURCES', 'INTERNATIONAL BUSINESS', 'IT', 'SALES AND MARKETING')),

REPORTS\_TO\_PROF\_ID  VARCHAR2(10) NOT NULL,

EMP\_SALARY          INTEGER NOT NULL,

YEARLY\_INCREMENT    INTEGER,

PRIMARY KEY (EMP\_ID, EMP\_NAME),

FOREIGN KEY (EMP\_ID, EMP\_NAME) REFERENCES TEACHING\_STAFF(EMP\_ID, EMP\_NAME) ON DELETE SET NULL,

CONSTRAINT A\_PROF\_ID UNIQUE(EMP\_ID),

FOREIGN KEY (DEPARTMENT\_NAME) REFERENCES DEPARTMENT(DEPARTMENT\_NAME) ON DELETE SET NULL,

FOREIGN KEY (REPORTS\_TO\_PROF\_ID) REFERENCES PROFESSOR(EMP\_ID) ON DELETE SET NULL);

CREATE TABLE INTERN (

EMP\_ID                  VARCHAR2(10) NOT NULL,

EMP\_NAME                VARCHAR2(35) NOT NULL,

EMP\_SALARY              INTEGER NOT NULL,

DEPARTMENT\_NAME         VARCHAR2(35) NOT NULL CHECK(DEPARTMENT\_NAME IN ('FASHION DESIGN', 'FINANCE', 'HUMAN RESOURCES', 'INTERNATIONAL BUSINESS', 'IT', 'SALES AND MARKETING')),

REPORTS\_TO\_ASST\_PROF\_ID VARCHAR2(10) NOT NULL,

PRIMARY KEY (EMP\_ID, EMP\_NAME),

FOREIGN KEY (EMP\_ID, EMP\_NAME) REFERENCES TEACHING\_STAFF(EMP\_ID, EMP\_NAME) ON DELETE SET NULL,

FOREIGN KEY (DEPARTMENT\_NAME) REFERENCES DEPARTMENT(DEPARTMENT\_NAME) ON DELETE SET NULL,

FOREIGN KEY (REPORTS\_TO\_ASST\_PROF\_ID) REFERENCES ASSISTANT\_PROFESSOR(EMP\_ID) ON DELETE SET NULL);

CREATE TABLE HEAD\_OF\_DEPARTMENT (

EMP\_ID                  VARCHAR2(10) NOT NULL,

EMP\_NAME                VARCHAR2(35) NOT NULL,

DEPARTMENT\_NAME         VARCHAR2(35) NOT NULL CHECK(DEPARTMENT\_NAME IN ('FASHION DESIGN', 'FINANCE', 'HUMAN RESOURCES', 'INTERNATIONAL BUSINESS', 'IT', 'SALES AND MARKETING')),

WORKING\_TENURE          VARCHAR2(15) NOT NULL,

EMP\_SALARY              INTEGER NOT NULL,

QUARTERLY\_INCREMENT     INTEGER,

NUM\_PROF\_REPORTING      INTEGER NOT NULL,

PRIMARY KEY (EMP\_ID, DEPARTMENT\_NAME),

FOREIGN KEY (DEPARTMENT\_NAME) REFERENCES DEPARTMENT(DEPARTMENT\_NAME) ON DELETE SET NULL);

CREATE TABLE PRINCIPAL (

P\_NAME              VARCHAR2(35) NOT NULL,

P\_DOB               DATE NOT NULL,

P\_CONTACT           CHAR(10) NOT NULL,

WORKING\_TENURE      VARCHAR2(15) NOT NULL,

PRIMARY KEY (P\_NAME));

CREATE TABLE BRANCHES (

BRANCH\_NAME             VARCHAR2(35) NOT NULL,

LOCATION                VARCHAR2(35) NOT NULL,

PRINCIPAL\_NAME          VARCHAR2(35) NOT NULL,

NUM\_COURSES             INTEGER NOT NULL,

PRIMARY KEY (BRANCH\_NAME),

FOREIGN KEY (PRINCIPAL\_NAME) REFERENCES PRINCIPAL(P\_NAME) ON DELETE SET NULL);

CREATE TABLE COURSES (

COURSE\_NAME             VARCHAR2(25) NOT NULL,

SPECIALISATION\_NAME     VARCHAR2(35) NOT NULL,

BRANCH\_NAME             VARCHAR2(35) NOT NULL,

FEES                    INTEGER NOT NULL,

DURATION                VARCHAR2(10) NOT NULL,

PLACEMENT\_RATINGS       NUMBER,

ELIGIBILITY             VARCHAR2(35),

PRIMARY KEY (COURSE\_NAME),

FOREIGN KEY (SPECIALISATION\_NAME) REFERENCES DEPARTMENT(DEPARTMENT\_NAME) ON DELETE SET NULL,

FOREIGN KEY (BRANCH\_NAME) REFERENCES BRANCHES(BRANCH\_NAME) ON DELETE SET NULL);

CREATE TABLE STUDENTS (

STUD\_ID                     VARCHAR2(15) NOT NULL,

STUD\_FULL\_NAME              VARCHAR2(35) NOT NULL,

STUD\_DOB                    DATE,

STUD\_ADDRESS                VARCHAR2(35) NOT NULL,

STUD\_COURSE\_NAME            VARCHAR2(25) NOT NULL,

STUD\_ACCOMMODATION\_TYPE     VARCHAR2(10) NOT NULL CHECK(STUD\_ACCOMMODATION\_TYPE IN ('HOSTEL', 'OWN', 'OTHER')),

STUD\_CONTACT                CHAR(10) NOT NULL,

STUD\_EMERGENCY\_NUM          CHAR(10) NOT NULL,

PRIMARY KEY (STUD\_ID),

FOREIGN KEY (STUD\_COURSE\_NAME) REFERENCES COURSES(COURSE\_NAME) ON DELETE SET NULL);

CREATE TABLE STUDENT\_LECTURES (

LECT\_NAME           VARCHAR2(35) NOT NULL,

STUD\_ID             VARCHAR2(15) NOT NULL,

PRIMARY KEY (LECT\_NAME, STUD\_ID),

FOREIGN KEY (LECT\_NAME) REFERENCES LECTURES(LECT\_NAME),

FOREIGN KEY (STUD\_ID) REFERENCES STUDENTS(STUD\_ID) ON DELETE SET NULL);

CREATE TABLE SERVICES (

SERVICE\_NAME            VARCHAR2(35) NOT NULL,

MONTHLY\_CHARGES         INTEGER NOT NULL,

AVAILABILITY\_HOURS      VARCHAR2(10) NOT NULL,

ADDITIONAL\_COMMMENTS    VARCHAR2(40),

PRIMARY KEY (SERVICE\_NAME));

CREATE TABLE BRANCH\_SERVICE (

BRANCH\_NAME         VARCHAR2(35) NOT NULL,

SERVICE\_NAME        VARCHAR2(35) NOT NULL,

PRIMARY KEY (BRANCH\_NAME, SERVICE\_NAME),

FOREIGN KEY (BRANCH\_NAME) REFERENCES BRANCHES(BRANCH\_NAME) ON DELETE SET NULL,

FOREIGN KEY (SERVICE\_NAME) REFERENCES SERVICES(SERVICE\_NAME) ON DELETE SET NULL);

CREATE TABLE CHAIRMAN (

CM\_INITIALS         CHAR(3) NOT NULL,

CM\_NAME             VARCHAR2(35) NOT NULL,

CM\_DOB              DATE NOT NULL,

CM\_ADDRESS          VARCHAR2(40) NOT NULL,

CM\_CONTACT\_NUM      CHAR(10) NOT NULL,

PRIMARY KEY (CM\_INITIALS, CM\_NAME));

CREATE TABLE DIRECTORS (

DIRECTOR\_INITIALS   CHAR(3) NOT NULL,

DIRECTOR\_NAME       VARCHAR2(35) NOT NULL,

WORKING\_TENURE      VARCHAR2(15) NOT NULL,

INCOME              INTEGER,

REPORTED\_BY         VARCHAR(25) NOT NULL CHECK(REPORTED\_BY IN ('FINANCE DEPARTMENT', 'MARKETING DEPARTMENT')),

DIRECTOR\_TYPE       VARCHAR(20) NOT NULL CHECK(DIRECTOR\_TYPE IN ('MANAGING DIRECTOR', 'MARKETING DIRECTOR')),

PRIMARY KEY (DIRECTOR\_INITIALS, DIRECTOR\_NAME));

CREATE TABLE MARKETING\_DEPARTMENT (

MONTH\_YEAR              VARCHAR2(15) NOT NULL,

REPORT\_ID               CHAR(10) NOT NULL,

ADVERTISING\_COSTS       INTEGER NOT NULL,

ADVERTISING\_PROFITS     INTEGER NOT NULL,

PRIMARY KEY (MONTH\_YEAR, REPORT\_ID),

CONSTRAINT MAR\_REP UNIQUE(REPORT\_ID));

CREATE TABLE FINANCE\_DEPARTMENT (

MONTH\_YEAR      VARCHAR2(15) NOT NULL,

REPORT\_ID       CHAR(10) NOT NULL,

TURN\_OVER       INTEGER NOT NULL,

PENDING\_PAYMENT INTEGER NOT NULL,

LIABILITIES     INTEGER NOT NULL,

ASSETS          INTEGER NOT NULL,

TAXES           INTEGER NOT NULL,

EQUITY          INTEGER NOT NULL,

PRIMARY KEY (MONTH\_YEAR, REPORT\_ID),

CONSTRAINT FIN\_REP UNIQUE(REPORT\_ID));

CREATE TABLE HOSTEL (

MONTH\_YEAR          VARCHAR2(15) NOT NULL,

HOSTEL\_NUM          CHAR(3) NOT NULL,

NUM\_ROOM\_AVAIL      INTEGER NOT NULL,

ROOM\_TYPE           VARCHAR2(10) NOT NULL CHECK(ROOM\_TYPE IN ('SINGLE', 'DOUBLE', 'TRIPLE')),

FEE\_PER\_ROOM        INTEGER NOT NULL,

PRIMARY KEY (MONTH\_YEAR, HOSTEL\_NUM));

CREATE TABLE RECEPTION (

MONTH\_YEAR          VARCHAR2(15) NOT NULL,

REPORT\_ID           CHAR(10) NOT NULL,

NUM\_APPLICANTS      INTEGER NOT NULL,

NUM\_ENQUIRIES       INTEGER NOT NULL,

NUM\_NOTICES         INTEGER NOT NULL,

PRIMARY KEY (MONTH\_YEAR, REPORT\_ID),

CONSTRAINT REC\_REP UNIQUE(REPORT\_ID));

CREATE TABLE ACCOUNTS\_DEPARTMENT (

MONTH\_YEAR          VARCHAR2(15) NOT NULL,

REPORT\_ID           CHAR(10) NOT NULL,

SCHOLARSHIPS        INTEGER NOT NULL,

EXPENSES            INTEGER NOT NULL,

SERVICE\_CHARGES     INTEGER,

EVENT\_TOUR\_COSTS    INTEGER,

SALARIES\_PAID       INTEGER NOT NULL,

FEE\_RECEIVED        INTEGER NOT NULL,

PRIMARY KEY (MONTH\_YEAR, REPORT\_ID),

CONSTRAINT ACC\_REP UNIQUE(REPORT\_ID));

CREATE TABLE APPLICANT\_DATA (

APPLICATION\_NUM             CHAR(12) NOT NULL,

APPLICANT\_FULL\_NAME         VARCHAR2(35) NOT NULL,

APPLICANT\_ADDRESS           VARCHAR2(40) NOT NULL,

APPLICANT\_DOB               DATE,

APPLICANT\_CONTACT           CHAR(10) NOT NULL,

APPLICANT\_COURSE            VARCHAR2(25) NOT NULL,

APPLICANT\_QUALIFICATIONS    VARCHAR2(35) NOT NULL,

DATE\_OF\_APPLYING            DATE,

PRIMARY KEY (APPLICATION\_NUM));

CREATE TABLE ADMIN (

MONTH\_YEAR              VARCHAR2(15) NOT NULL,

INTERVIEWS\_TAKEN        INTEGER NOT NULL,

NEW\_ADMISSIONS          INTEGER NOT NULL,

REJECTED\_APPLICATIONS   INTEGER NOT NULL,

LAST\_WEBSITE\_UPDATE     DATE NOT NULL,

PRIMARY KEY (MONTH\_YEAR));

CREATE TABLE EVENTS\_DEPARTMENT (

MONTH\_YEAR              VARCHAR2(15) NOT NULL,

REPORT\_ID               CHAR(10) NOT NULL,

ACAD\_EVENTS             INTEGER NOT NULL,

EXTRA\_EVENTS            INTEGER NOT NULL,

TOTAL\_COSTS             INTEGER NOT NULL,

PRIMARY KEY (MONTH\_YEAR, REPORT\_ID),

CONSTRAINT EVE\_REP UNIQUE(REPORT\_ID));

CREATE TABLE MONTHLY\_REPORTS (

MONTH\_YEAR              VARCHAR2(15) NOT NULL,

FINANCE\_REPORT\_ID       CHAR(10) NOT NULL,

EVENTS\_REPORT\_ID        CHAR(10) NOT NULL,

ACC\_REPORT\_ID           CHAR(10) NOT NULL,

MARKT\_REPORT\_ID         CHAR(10) NOT NULL,

RECEP\_REPORT\_ID         CHAR(10) NOT NULL,

PRIMARY KEY (MONTH\_YEAR, FINANCE\_REPORT\_ID, EVENTS\_REPORT\_ID, ACC\_REPORT\_ID, MARKT\_REPORT\_ID, RECEP\_REPORT\_ID),

FOREIGN KEY (FINANCE\_REPORT\_ID) REFERENCES FINANCE\_DEPARTMENT(REPORT\_ID) ON DELETE SET NULL,

FOREIGN KEY (EVENTS\_REPORT\_ID) REFERENCES EVENTS\_DEPARTMENT(REPORT\_ID) ON DELETE SET NULL,

FOREIGN KEY (ACC\_REPORT\_ID) REFERENCES ACCOUNTS\_DEPARTMENT(REPORT\_ID) ON DELETE SET NULL,

FOREIGN KEY (MARKT\_REPORT\_ID) REFERENCES MARKETING\_DEPARTMENT(REPORT\_ID) ON DELETE SET NULL,

FOREIGN KEY (RECEP\_REPORT\_ID) REFERENCES RECEPTION(REPORT\_ID) ON DELETE SET NULL);

# iNSERTING DATA INTO TABLES:

INSERT INTO DEPARTMENT VALUES ('FASHION DESIGN', 'FD01', 2);

INSERT INTO DEPARTMENT VALUES ('FINANCE', 'FN02', 1);

INSERT INTO DEPARTMENT VALUES ('HUMAN RESOURCES', 'HR03', 2);

INSERT INTO DEPARTMENT VALUES ('INTERNATIONAL BUSINESS', 'IB04', 1);

INSERT INTO DEPARTMENT VALUES ('IT', 'IT05', 2 );

INSERT INTO DEPARTMENT VALUES ('SALES AND MARKETING','SM06', 1);

INSERT INTO EMPLOYEES VALUES ('EMPNO00001', 'Asif Ali', '01-Mar-1994', 'Kurukshetra', '9876543210', 'WORKING', '03-Nov-2018', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00045', 'Baljeet', '23-Dec-1996', 'Karnal', '8654127956', 'ON LEAVE', '28-May-2017', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00756', 'David Nike', '18-Nov-1993', 'Rawa', '9784568521', 'NO SHIFT', '26-Oct-2010', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00021', 'Daman', '13-May-1999', 'Karnal', '7894587458', 'OLD EMPLOYEE', '04-Jun-2019', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00671', 'Florina', '12-Jun-1992', 'Karnal', '9879879658', 'OLD EMPLOYEE', '21-Apr-2012', 'MANAGEMENT\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00980', 'Firoz Khan', '19-May-1995', 'Kurukshetra', '8546854685', 'NO SHIFT', '08-Jan-2013', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00004', 'Harish Kaur', '26-Sep-1995', 'Karnal', '8523698741', 'WORKING', '19-Nov-2010', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00554', 'Jai', '27-Aug-1994', 'Kurukshetra', '9512436087', 'OLD EMPLOYEE', '11-Dec-2018', 'MANAGEMENT\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO12564', 'Jaya', '05-Jun-1993', 'Kurukshetra', '9512435587', 'WORKING', '01-Aug-2019', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00234', 'Kamal', '30-Nov-1996', 'Karnal', '9002323018', 'WORKING', '03-Aug-2019', 'MANAGEMENT\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00321', 'Kirandeep', '11-Mar-1996', 'Rawa', '9870650650', 'NO SHIFT', '01-Jul-2016', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO05891', 'Manav Singh', '27-Feb-1999', 'Kurukshetra', '8457623591', 'OLD EMPLOYEE', '09-Jan-2013', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO09051', 'Mehak', '14-Jan-1998', 'Karnal', '8965236523', 'ON LEAVE', '16-Oct-2019', 'MANAGEMENT\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO00501', 'Neeraj', '11-Oct-2000', 'Kurukshetra', '9876549870', 'WORKING', '18-Sep-2020', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO27001', 'Oliver', '22-Jul-2001', 'Kurukshetra', '9856985698', 'WORKING', '10-Aug-2014', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO04401', 'Paras', '26-Nov-1993', 'Karnal', '7854789654', 'WORKING', '30-Aug-2017', 'MANAGEMENT\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO09801', 'Paul', '17-Dec-1994', 'Rawa', '9632541087', 'NO SHIFT', '13-Apr-2020', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO30701', 'Rhea', '09-Jun-1996', 'Kurukshetra', '9874152630', 'ON LEAVE', '06-Jun-2011', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO33001', 'Sammy', '05-Mar-1997', 'Karnal', '8005400630', 'WORKING', '15-Jul-2017', 'TEACHING\_STAFF');

INSERT INTO EMPLOYEES VALUES ('EMPNO49501', 'Stuart', '31-Jan-1997', 'Rawa', '9112053306', 'WORKING', '31-Dec-2013', 'TEACHING\_STAFF');

INSERT INTO MANAGEMENT\_STAFF VALUES ('EMPNO00671', 'Florina', 'Cleaning', '2012-2018', 'Janitor');

INSERT INTO MANAGEMENT\_STAFF VALUES ('EMPNO00554', 'Jai', 'Reception', '2018-2020', 'Cashier');

INSERT INTO MANAGEMENT\_STAFF VALUES ('EMPNO00234', 'Kamal', 'Events\_Department', '2019-CURRENT', 'Events\_Manager');

INSERT INTO MANAGEMENT\_STAFF VALUES ('EMPNO09051', 'Mehak', 'Hostel', '2019-CURRENT', 'Warden');

INSERT INTO MANAGEMENT\_STAFF VALUES ('EMPNO04401', 'Paras', 'Marketing and Website', '2017-CURRENT', 'Programmer');

INSERT INTO DESIGNATION VALUES ('Janitor', 10000, 1200);

INSERT INTO DESIGNATION VALUES ('Cashier', 12000, 1000);

INSERT INTO DESIGNATION VALUES ('Events\_Manager', 17000, 1300);

INSERT INTO DESIGNATION VALUES ('Warden', 10000, 1000);

INSERT INTO DESIGNATION VALUES ('Programmer', 20000, 1700 );

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00001', 'Asif Ali', '2018-CURRENT', 'ASSISTANT PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00045', 'Baljeet', '2017-CURRENT', 'ASSISTANT PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00756', 'David Nike', '2010-CURRENT', 'PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00021', 'Daman', '2019-2020', 'INTERN');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00980', 'Firoz Khan', '2013-CURRENT', 'PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00004', 'Harish Kaur', '2010-CURRENT', 'PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00321', 'Kirandeep', '2016-CURRENT', 'ASSISTANT PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO05891', 'Manav Singh', '2013-2016', 'INTERN');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO00501', 'Neeraj', '2020-CURRENT', 'INTERN');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO27001', 'Oliver', '2014-CURRENT', 'ASSISTANT PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO09801', 'Paul', '2020-CURRENT', 'INTERN');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO30701', 'Rhea', '2011-CURRENT', 'PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO33001', 'Sammy', '2017-CURRENT', 'ASSISTANT PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO49501', 'Stuart', '2013-CURRENT', 'PROFESSOR');

INSERT INTO TEACHING\_STAFF VALUES ('EMPNO12564', 'Jaya', '2019-CURRENT', 'INTERN');

INSERT INTO LECTURES VALUES ('TECHNIQUES OF MONEY MANAGEMENT', 2, '9 TO 11 AM');

INSERT INTO LECTURES VALUES ('REUSE OF WASTE RESOURCES', 2, '1 TO 3 PM');

INSERT INTO LECTURES VALUES ('INCOME TARGETS AND TRICKS', 1, '8 TO 9 AM');

INSERT INTO LECTURES VALUES ('ART OF ANCIENT WORKS', 3, '11.30 AM TO 2.30 PM');

INSERT INTO LECTURES VALUES ('FOUNDATION OF IT', 2, '4 TO 6 PM');

INSERT INTO PROFESSOR VALUES ('EMPNO00756', 'David Nike', 'FINANCE', 'TECHNIQUES OF MONEY MANAGEMENT', 5, 60000, 1500);

INSERT INTO PROFESSOR VALUES ('EMPNO00980', 'Firoz Khan', 'HUMAN RESOURCES', 'REUSE OF WASTE RESOURCES', 4, 55000, 1300);

INSERT INTO PROFESSOR VALUES ('EMPNO00004', 'Harish Kaur', 'FINANCE', 'INCOME TARGETS AND TRICKS', 6, 60000, 1500);

INSERT INTO PROFESSOR VALUES ('EMPNO30701', 'Rhea', 'FASHION DESIGN', 'ART OF ANCIENT WORKS', 3, 63000, 1700);

INSERT INTO PROFESSOR VALUES ('EMPNO49501', 'Stuart', 'IT', 'FOUNDATION OF IT', 5, 70000, 2000);

INSERT INTO ASSISTANT\_PROFESSOR VALUES ('EMPNO00001', 'Asif Ali', 'FASHION DESIGN', 'EMPNO30701', 30000, 1500);

INSERT INTO ASSISTANT\_PROFESSOR VALUES ('EMPNO00045', 'Baljeet', 'HUMAN RESOURCES', 'EMPNO00980', 29000, 1300);

INSERT INTO ASSISTANT\_PROFESSOR VALUES ('EMPNO00321', 'Kirandeep', 'FINANCE', 'EMPNO00004', 32000, 1700);

INSERT INTO ASSISTANT\_PROFESSOR VALUES ('EMPNO27001', 'Oliver', 'FASHION DESIGN', 'EMPNO30701', 30000, 1500);

INSERT INTO ASSISTANT\_PROFESSOR VALUES ('EMPNO33001', 'Sammy', 'IT', 'EMPNO49501', 35000, 2000);

INSERT INTO INTERN VALUES ('EMPNO00021', 'Daman', 5000, 'FASHION DESIGN', 'EMPNO00001');

INSERT INTO INTERN VALUES ('EMPNO05891', 'Manav Singh',4000, 'FINANCE', 'EMPNO00321');

INSERT INTO INTERN VALUES ('EMPNO00501', 'Neeraj',5000, 'FASHION DESIGN', 'EMPNO27001');

INSERT INTO INTERN VALUES ('EMPNO09801', 'Paul',6000, 'IT', 'EMPNO33001');

INSERT INTO INTERN VALUES ('EMPNO12564', 'Jaya',6000, 'IT', 'EMPNO33001');

INSERT INTO HEAD\_OF\_DEPARTMENT VALUES ('EMPNO78945', 'RAVI', 'FASHION DESIGN', '2010-CURRENT', 130000, 3000, 8);

INSERT INTO HEAD\_OF\_DEPARTMENT VALUES ('EMPNO96854', 'SHINKHA', 'HUMAN RESOURCES', '2009-CURRENT', 115000, 2600, 15);

INSERT INTO HEAD\_OF\_DEPARTMENT VALUES ('EMPNO06665', 'TAMANNA', 'FINANCE', '2013-CURRENT', 140000, 3400, 15);

INSERT INTO HEAD\_OF\_DEPARTMENT VALUES ('EMPNO27056', 'YASH', 'FASHION DESIGN', '2008-CURRENT',130000, 3000, 8);

INSERT INTO HEAD\_OF\_DEPARTMENT VALUES ('EMPNO33081', 'ZAKIR', 'IT', '2011-CURRENT', 150000, 5000, 13);

INSERT INTO PRINCIPAL VALUES ('JANE PAULO','11-Jul-1985', '9865986325', '2008-CURRENT');

INSERT INTO PRINCIPAL VALUES ('DEAN TOOR', '16-Nov-1979', '9857412360', '2015-CURRENT');

INSERT INTO PRINCIPAL VALUES ('HUGH BANSAL', '28-Jun-1981', '9758496200', '2011-CURRENT');

INSERT INTO PRINCIPAL VALUES ('LOVELY SINGH', '30-Mar-1988', '8000321605', '2019-CURRENT');

INSERT INTO BRANCHES VALUES ('BCHE', 'KARNAL, SECTOR 9', 'JANE PAULO', 4);

INSERT INTO BRANCHES VALUES ('BCE', 'KARNAL, SECTOR 8', 'DEAN TOOR', 2);

INSERT INTO BRANCHES VALUES ('BCA', 'KARNAL, SECTOR 12', 'HUGH BANSAL', 1);

INSERT INTO BRANCHES VALUES ('BCM', 'KARNAL, SECTOR 13', 'LOVELY SINGH', 2);

INSERT INTO COURSES VALUES ('MBA', 'FINANCE', 'BCM',300000, '2 YEARS', 3.8, 'CLASS 12 OR EQUIVALENT');

INSERT INTO COURSES VALUES ('B.COM', 'SALES AND MARKETING', 'BCHE', 200000,'3 YEARS', 4.5, 'CLASS 12 OR EQUIVALENT');

INSERT INTO COURSES VALUES ('B.SC', 'FASHION DESIGN', 'BCHE', 400000, '4 YEARS', 3.3, 'CLASS 12 OR EQUIVALENT');

INSERT INTO COURSES VALUES ('BFA', 'HUMAN RESOURCES', 'BCHE', 300000, '3 YEARS', 4.9, 'CLASS 12 OR EQUIVALENT');

INSERT INTO COURSES VALUES ('B.ARCH', 'HUMAN RESOURCES', 'BCA', 500000 , '5 YEARS', 3.6, 'CLASS 12 OR EQUIVALENT');

INSERT INTO COURSES VALUES ('B.ED', 'IT', 'BCE', 400000, '3 YEARS', 4.2, 'CLASS 12 OR EQUIVALENT');

INSERT INTO STUDENTS VALUES ('STU\_FIN\_00001','AIYSHA', '04-May2002', 'KARNAL', 'MBA', 'HOSTEL', '9865986532', '8798795462');

INSERT INTO STUDENTS VALUES ('STU\_HRS\_00001','JANISHA', '11-Aug-2001', 'RAWA', 'B.ARCH', 'OWN', '8794563210', '8965230145' );

INSERT INTO STUDENTS VALUES ('STU\_FIN\_00012','KAVITA', '26-Dec-2004', 'KKR', 'MBA', 'HOSTEL', '7878784545', '7894586320' );

INSERT INTO STUDENTS VALUES ('STU\_FDS\_00004','LAKSH', '20-Jul-1999', 'DELHI', 'B.SC', 'OTHER', '7485962301', '9003690036' );

INSERT INTO STUDENTS VALUES ('STU\_ITD\_00031','PARUL', '15-Mar-1997', 'RAWA', 'B.ED', 'HOSTEL', '8794856123', '9807465321' );

INSERT INTO STUDENT\_LECTURES VALUES ('TECHNIQUES OF MONEY MANAGEMENT', 'STU\_FIN\_00001');

INSERT INTO STUDENT\_LECTURES VALUES ('REUSE OF WASTE RESOURCES', 'STU\_HRS\_00001');

INSERT INTO STUDENT\_LECTURES VALUES ('INCOME TARGETS AND TRICKS', 'STU\_FIN\_00012');

INSERT INTO STUDENT\_LECTURES VALUES ('ART OF ANCIENT WORKS', 'STU\_FDS\_00004');

INSERT INTO STUDENT\_LECTURES VALUES ('FOUNDATION OF IT','STU\_ITD\_00031');

INSERT INTO SERVICES VALUES ('GYM', 500, '5AM TO 11PM', 'SEPARATE FOR BOYS AND GIRLS');

INSERT INTO SERVICES VALUES ('SPORTS', 1000, '9AM TO 7PM', 'FREE EQUIPMENT AVAILABLE');

INSERT INTO SERVICES VALUES ('YOGA', 800, '6AM TO 9AM', 'BRETHE FRESH AND STAY HEALTHY');

INSERT INTO SERVICES VALUES ('CAFE', 300, '24HOURS', 'TAX-FREE COFFEE ANYTIME');

INSERT INTO SERVICES VALUES ('CANTEEN', 450, '24HOURS', 'COME AND GRAB SOME FOOD');

INSERT INTO BRANCH\_SERVICE VALUES ('BCHE', 'CANTEEN');

INSERT INTO BRANCH\_SERVICE VALUES ('BCA', 'CANTEEN');

INSERT INTO BRANCH\_SERVICE VALUES ('BCM', 'SPORTS');

INSERT INTO BRANCH\_SERVICE VALUES ('BCHE', 'CAFE');

INSERT INTO BRANCH\_SERVICE VALUES ('BCE', 'CAFE');

INSERT INTO CHAIRMAN VALUES ('LKR', 'LALA KHUSHI RAM','22-Feb-1965', 'LUDHIANA', '6523987001');

INSERT INTO CHAIRMAN VALUES ('RMG', 'RAM MOHAN GUPTA', '22-Jun-1972', 'PAKHOWAL', '8659653207');

INSERT INTO DIRECTORS VALUES ('LKS', 'LAAL KHUSH SINGH', 'FOUNDATION-2000', 200000, 'FINANCE DEPARTMENT', 'MANAGING DIRECTOR');

INSERT INTO DIRECTORS VALUES ('RMG', 'RAM MOHAN GUPTA', 'FOUNDATION-2000', 400000, 'MARKETING DEPARTMENT', 'MARKETING DIRECTOR');

INSERT INTO DIRECTORS VALUES ('NTG', 'NITESH GUPTA', '2000-CURRENT', 1000000, 'FINANCE DEPARTMENT', 'MANAGING DIRECTOR');

INSERT INTO DIRECTORS VALUES ('MKG', 'MEENAKSHI GUPTA', '2000-CURRENT', 1000000, 'FINANCE DEPARTMENT', 'MANAGING DIRECTOR');

INSERT INTO DIRECTORS VALUES ('ASG', 'ASHISH GUPTA', '2002-CURRENT', 800000, 'MARKETING DEPARTMENT', 'MARKETING DIRECTOR');

INSERT INTO MARKETING\_DEPARTMENT VALUES ('APR-21', 'MKT\_REP01', 20000, 55000);

INSERT INTO MARKETING\_DEPARTMENT VALUES ('MAY-21', 'MKT\_REP02', 30000, 40000);

INSERT INTO MARKETING\_DEPARTMENT VALUES ('AUG-21', 'MKT\_REP03', 10000, 60000);

INSERT INTO MARKETING\_DEPARTMENT VALUES ('SEP-21', 'MKT\_REP04', 10000, 50000);

INSERT INTO MARKETING\_DEPARTMENT VALUES ('OCT-21', 'MKT\_REP05', 29000, 50000);

INSERT INTO FINANCE\_DEPARTMENT VALUES ('APR-21', 'FIN\_REP01', 20000, 55000, 50000, 56000, 300000, 500000);

INSERT INTO FINANCE\_DEPARTMENT VALUES ('MAY-21', 'FIN\_REP02', 30000, 40000, 70000, 46000, 600000, 500000);

INSERT INTO FINANCE\_DEPARTMENT VALUES ('AUG-21', 'FIN\_REP03', 100000, 60000, 30000, 73000, 300000, 500000);

INSERT INTO FINANCE\_DEPARTMENT VALUES ('SEP-21', 'FIN\_REP04', 100000, 50000, 50000, 50000, 600000, 500000);

INSERT INTO FINANCE\_DEPARTMENT VALUES ('OCT-21', 'FIN\_REP05', 29000, 30000, 56000, 60000, 300000, 500000);

INSERT INTO HOSTEL VALUES ('APR-21', 'A01', 10, 'SINGLE', 6000);

INSERT INTO HOSTEL VALUES ('MAY-21', 'B03', 8, 'DOUBLE', 4500);

INSERT INTO HOSTEL VALUES ('AUG-21', 'C02', 7, 'DOUBLE', 4000);

INSERT INTO HOSTEL VALUES ('SEP-21', 'A02', 15, 'TRIPLE', 4000);

INSERT INTO HOSTEL VALUES ('OCT-21', 'B01', 4, 'SINGLE', 5500);

INSERT INTO RECEPTION VALUES ('APR-21', 'REC\_REP01', 100, 300, 50);

INSERT INTO RECEPTION VALUES ('MAY-21', 'REC\_REP02', 75, 200, 70);

INSERT INTO RECEPTION VALUES ('AUG-21', 'REC\_REP03', 70, 100, 30);

INSERT INTO RECEPTION VALUES ('SEP-21', 'REC\_REP04', 150, 130, 20);

INSERT INTO RECEPTION VALUES ('OCT-21', 'REC\_REP05', 40, 120, 56);

INSERT INTO ACCOUNTS\_DEPARTMENT VALUES ('APR-21', 'ACC\_REP01', 20000, 55000, 50000, 56000, 300000, 500000);

INSERT INTO ACCOUNTS\_DEPARTMENT VALUES ('MAY-21', 'ACC\_REP02', 30000, 40000, 70000, 46000, 600000, 500000);

INSERT INTO ACCOUNTS\_DEPARTMENT VALUES ('AUG-21', 'ACC\_REP03', 100000, 60000, 30000, 73000, 300000, 500000);

INSERT INTO ACCOUNTS\_DEPARTMENT VALUES ('SEP-21', 'ACC\_REP04', 100000, 50000, 50000, 50000, 600000, 500000);

INSERT INTO ACCOUNTS\_DEPARTMENT VALUES ('OCT-21', 'ACC\_REP05', 29000, 30000, 56000, 60000, 300000, 500000);

INSERT INTO APPLICANT\_DATA VALUES ('APP\_FIN\_010','AIANA', 'KARNAL', '02-Dec-2002', '9865986532', 'MBA', 'CLASS 12', '28-May-2021');

INSERT INTO APPLICANT\_DATA VALUES ('APP\_HRS\_001','JATIN', 'RAWA', '12-Apr-2001', '8794563210', 'B.ARCH', 'CLASS 12', '25-May-2021');

INSERT INTO APPLICANT\_DATA VALUES ('APP\_FIN\_012','KOMAL', 'KKR', '28-Mar-2004', '7878784545', 'MBA',  'CLASS 10', '27-May-2021');

INSERT INTO APPLICANT\_DATA VALUES ('APP\_FDS\_004','LAVISH', 'DELHI', '12-Jul-1999', '7485962301', 'B.SC', 'CLASS 10', '12-May-2021');

INSERT INTO APPLICANT\_DATA VALUES ('APP\_ITD\_031','SITA', 'RAWA', '05-Aug-1997', '8794856123', 'B.ED', 'CLASS 12', '15-May-2021');

INSERT INTO ADMIN VALUES ('APR-21', 100, 300, 50, '02-May-2021');

INSERT INTO ADMIN VALUES ('MAY-21', 75, 200, 70, '02-Jun-2021');

INSERT INTO ADMIN VALUES ('AUG-21', 70, 100, 30, '02-Jul-2021');

INSERT INTO ADMIN VALUES ('SEP-21', 150, 130, 20, '02-Aug-2021');

INSERT INTO ADMIN VALUES ('OCT-21',  40, 120, 56, '02-Sep-2021');

INSERT INTO EVENTS\_DEPARTMENT VALUES ('APR-21', 'EVE\_REP01', 2, 5, 50000);

INSERT INTO EVENTS\_DEPARTMENT VALUES ('MAY-21', 'EVE\_REP02', 3, 4, 70000);

INSERT INTO EVENTS\_DEPARTMENT VALUES ('AUG-21', 'EVE\_REP03', 1, 6, 30000);

INSERT INTO EVENTS\_DEPARTMENT VALUES ('SEP-21', 'EVE\_REP04', 1, 5, 50000);

INSERT INTO EVENTS\_DEPARTMENT VALUES ('OCT-21', 'EVE\_REP05', 2, 3, 56000);

INSERT INTO MONTHLY\_REPORTS VALUES ('APR-21', 'FIN\_REP01', 'EVE\_REP01', 'ACC\_REP01', 'MKT\_REP01', 'REC\_REP01');

INSERT INTO MONTHLY\_REPORTS VALUES ('MAY-21', 'FIN\_REP02', 'EVE\_REP02', 'ACC\_REP02', 'MKT\_REP02', 'REC\_REP02');

INSERT INTO MONTHLY\_REPORTS VALUES ('AUG-21', 'FIN\_REP03', 'EVE\_REP03', 'ACC\_REP03', 'MKT\_REP03', 'REC\_REP03');

INSERT INTO MONTHLY\_REPORTS VALUES ('SEP-21', 'FIN\_REP04', 'EVE\_REP04', 'ACC\_REP04', 'MKT\_REP04', 'REC\_REP04');

INSERT INTO MONTHLY\_REPORTS VALUES ('OCT-21',  'FIN\_REP05', 'EVE\_REP05', 'ACC\_REP05', 'MKT\_REP05', 'REC\_REP05');

# ALTER AND UPDATE TABLE:

a) Name of the Table – EMPLOYEES

Name of the Column – Emergency Contact

data type - CHAR, size = 10

default value - 1234567890

**SQL QUERY:**

**ALTER TABLE EMPLOYEES ADD (EMERGENCY\_CONTACT CHAR(10) DEFAULT '1234567890');**

**SCREENSHOTS:**

**![Text

Description automatically generated]()**

b) Condition – EMP\_JOB\_STATUS = ‘WORKING’

New Value of EMERGENCY CONTACT = 9876543210

**SQL QUERY:**

UPDATE EMPLOYEES SET EMERGENCY\_CONTACT = 9876543210 WHERE EMP\_JOB\_STATUS = 'WORKING';

![Text

Description automatically generated]()**SCREENSHOTS:**

# DATA MANIPULATION USING SQL COMMANDS:

* + 1. List Assistant Professor salary and name from Assistant Professor table, merged with Intern salary and Name from Intern table where Assistant Professor salary is more than Intern salary and ordered by Assistant Professor salary.

**SQL QUERY:**

SELECT ASSISTANT\_PROFESSOR.EMP\_NAME, ASSISTANT\_PROFESSOR.EMP\_SALARY, INTERN.EMP\_NAME, INTERN.EMP\_SALARY FROM ASSISTANT\_PROFESSOR INNER JOIN INTERN ON ASSISTANT\_PROFESSOR.EMP\_SALARY > INTERN.EMP\_SALARY ORDER BY ASSISTANT\_PROFESSOR.EMP\_SALARY;

**SCREENSHOT:**

**![Text

Description automatically generated]()**

* + 1. List interns whose salary is in (4500, 5000)

**SQL QUERY:**

SELECT \* FROM INTERN WHERE EMP\_SALARY IN (4500, 5000);

**SCREENSHOT:**

**![Graphical user interface, text

Description automatically generated]()**

* + 1. List the employee name, employee type and student name if the address is same using Full(Outer) Join

**SQL QUERY:**

SELECT EMPLOYEES.EMP\_NAME, EMPLOYEES.EMP\_TYPE, STUDENTS.STUD\_FULL\_NAME FROM EMPLOYEES FULL JOIN STUDENTS ON EMPLOYEES.EMP\_ADDRESS = STUDENTS.STUD\_ADDRESS;

**SCREENSHOT:**

Text

Description automatically generated

* + 1. Using System Date function to calculate working days of employees using their joining date.

**SQL QUERY:**

SELECT EMP\_NAME, ROUND((SYSDATE - EMP\_JOINING\_DATE), 0) AS "WORKING\_DAYS" FROM EMPLOYEES;

**SCREENSHOTS:**

Text

Description automatically generated

* + 1. A view which shows name of the person whose initials are a part of both director and chairman’s initials list.

**SQL QUERY:**

CREATE VIEW VIEW01 AS SELECT CHAIRMAN.CM\_INITIALS, DIRECTORS.DIRECTOR\_INITIALS, CHAIRMAN.CM\_NAME FROM CHAIRMAN INNER JOIN DIRECTORS ON CHAIRMAN.CM\_INITIALS = DIRECTORS.DIRECTOR\_INITIALS;

**SCREENSHOTS:**

**![Text

Description automatically generated]()**

# DATA security and privacy:

Looking in a broader way, data security and privacy are both a part of data protection. With the introduction of great technology, we have already shifted our dependency to computer systems and networks to this extent that even the protection is now a duty that system must follow. In the current situations of work from home, people are completely relied on online transmission of data, whether it is for knowledge, some confidential or any personal data. This makes us more prone to the cybercrimes unethical breaches that happen leading to damages. There are people called attackers, or hackers who breach networks and steal the information they desire and then use it for illegal, and personal gains. This can not be avoided completely but we can take our precautions to reduce them.

Let’s first go thru the cybercrimes that can harm an educational institutional, like this college:

* Stolen data from the servers might contain student or employee’s personal information, which can be used for malicious purposes even by the people involved in this institution. Thus, access must be restricted for different authorities.
* Usage of faulty hardware like hard-drives, pen-drives is equally dangerous.
* Computer viruses without any backups is a huge loss for any organisation.
* Intentional system hacking and gaining access to restricted content in a completely wrong manner can become very dangerous.

To avoid these things, basic measures that must be followed include:

* Preventing Social Engineering (*Hurix, 2021)*

At this stage it’s easy to be trapped in trojan viruses hidden in phishing mails. WE must be sensible enough before we open them so as to not to welcome a virus into our computer.

* Efficient Data Storage and Transmission Techniques

Leaving behind old stacks of paperwork, we must now shift to digitalised security measures that involve:

* Encryption: Encoding information into a non-common language but a decodable one.
* Authentication: A safe way of matching credentials, that people other than you are not supposed to know.
* Data Loss Prevention: It is a practice that we all must follow by preparing back-ups, copies that can be retrieved in case of data loss.
* Legislation: It means to consider some effective measures that can be used for data protection as legal, irrespective of the fact that they are illegal or not.
* Threat Monitoring: There are quite advanced systems for the purpose that universities must get installed in cast there are signs of data breach even after good level of protection.

Other than these digital securities, following points must be taken care of:

1. Physical Security: The server of our database should always be in an environment, which is secure, and climate controlled. Cloud is a modern concept of online storage and cloud servers are considered quite safe in terms of the purpose they fulfil.
2. Database software security: Software being used I our system should always be latest, leaving no chance of data leaks or malfunctions.
3. Application security: It is equally important to continuously test the safe working of the interface as well, through which we are interacting to the database.
4. Device Security: Make sure that the system is in right hands and no dangers can be avoided if a wrong person catches the physical hold of the system.*(IBM Cloud Education, 2019)*

# DATA security and privacy:

As we inculcate the use of modern technologies in our lives, a lot of data processing, storing, and transmitting comes with them. Data has become an essential part of lives but when it becomes impossible for our traditional tools to handle some data, we say it as the ‘Big Data’. Big data comes with three main characteristics if we generally consider it:

* VELOCITY – Batch, real-time, stream processing

More data generally means more processing time, which would mean excess amounts of data can easily crash our traditional systems, but there is a limit before that which is very useful to us in terms of managing it. We can not only manage the data efficiently with good outputs to a certain extent but also draw amazing conclusions that lead to developments in modern science.

* VOLUME – Terabytes of data, Billions of Records

Considering the data for every millisecond that a machine can create, it is not hard enough to have petabytes of data and no tool to store it. We have been encountering terabytes in our lives, but when we look deeply in this vast field, there is an infinite volume of data that needs to be stored, and that is what we call bigdata.

* VARIETY – Structured, Unstructured, Semi-structured data

It matters to a great amount while accessing data that how it is stored. Even very small data stored poorly in an unorganised will make its processing ages long, but a great amount of data stored using efficient systems such as DBMS at small level helps in quick data accessing and processing.

Let’s consider few points about how bid data has productive applications in the education sector.

* Enhanced Performance: Creating a network of data gives better ways of learnings to the students, thus enhancing their performance. An interactive study way as they get quick response from the technology they are using. The credit here is to good structure of material, which surely improves efficiency.
* Grading System: A fair grading system based on student’s responses and question’s difficulty level can be created giving everyone a good chance to outshine. Fair grading is an essential component for evaluation of what has been learned.
* Attentive classes: Using sensor-based technology, a student’s reactions, heartbeat, pulse, and temperature can show the level of interest shown by him in the class without even himself knowing about it. It gives a chance to teachers to bring these children up by more focus and hard work.
* Interactive sessions: Awesome programs, hardware and software technology automatically draws interest of students when it is considered as fun rather than an assignment that needs to be marked.

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