Aditya College of Engineering & Technology
Software Engineering Lab

Experiment-1

1) Perform the following, for the following experiments:

i. Do the Requirement Analysis and Prepare SRS

ii. Draw E-R diagrams, DFD, CFD and structured charts for the project.

OBJECTIVE: To Implement Requirement Analysis and Prepare SRS

DESCRIPTION:

- A requirements specification for a software system is a complete description of the behaviour of a system to be developed
- The Customer Requires Complete requirements are described in a formal document called software requirements specification (SRS)
- Software requirements specification (SRS) document is formal document that provides the complete description of proposed software., what the software will do without describing how it will do so

The Structure of SRS:

1. General description
2. Functional Requirements
3. Interface Requirements
4. Performance Requirements
5. Design Constraints
6. Non-Functional Attributes

1.General description:

In this, general functions of product which includes objective of user, a user characteristic, features, benefits, about why its importance is mentioned. It also describes features of user community.

2.Functional Requirements:

In software engineering, a functional requirement defines a system or its component. It describes the functions a software must perform. A function is nothing but inputs, its behaviour, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform.

3.NON-Functional Requirements:

A non-functional requirement defines the quality attribute of a software system. They represent a set of standards used to judge the specific operation of a system. Example, how fast does the website load?

A non-functional requirement is essential to ensure the usability and effectiveness of the entire software system. Failing to meet non-functional requirements can result in systems that fail to satisfy user needs.

4. Interface Requirements:
In this, software interfaces which mean how software program communicates with each other or users either in form of any language, code, or message are fully described and explained. Examples can be shared memory, data streams, etc

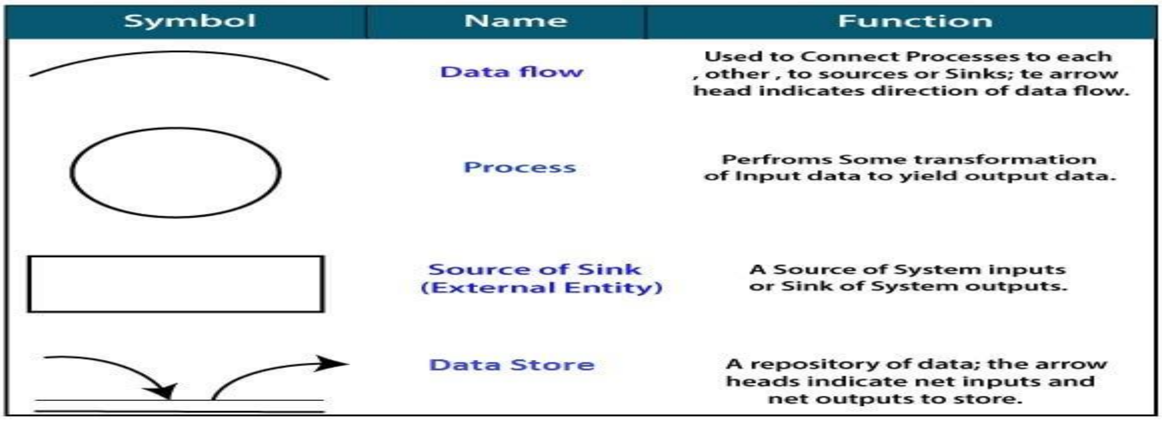
5. Performance Requirements:
In this, how a software system performs desired functions under specific condition is explained. It also explains required time, required memory, maximum error rate, etc.

6. Design Constraints:
In this, constraints which simply means limitation or restriction are specified and explained for design team. Examples may include use of a particular algorithm, hardware and software limitations, etc.

ii) DFD, ER-MODEL, CFD

DFD Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It can be manual, automated, or a combination of both.



Symbol	Name	Function
	Data flow	Used to Connect Processes to each , other , to sources or Sinks; te arrow head indicates direction of data flow.
	Process	Perfroms Some transformation of Input data to yield output data.
	Source of Sink (External Entity)	A Source of System inputs or Sink of System outputs.
	Data Store	A repository of data; the arrow heads indicate net inputs and net outputs to store.

Symbols for Data Flow Diagrams

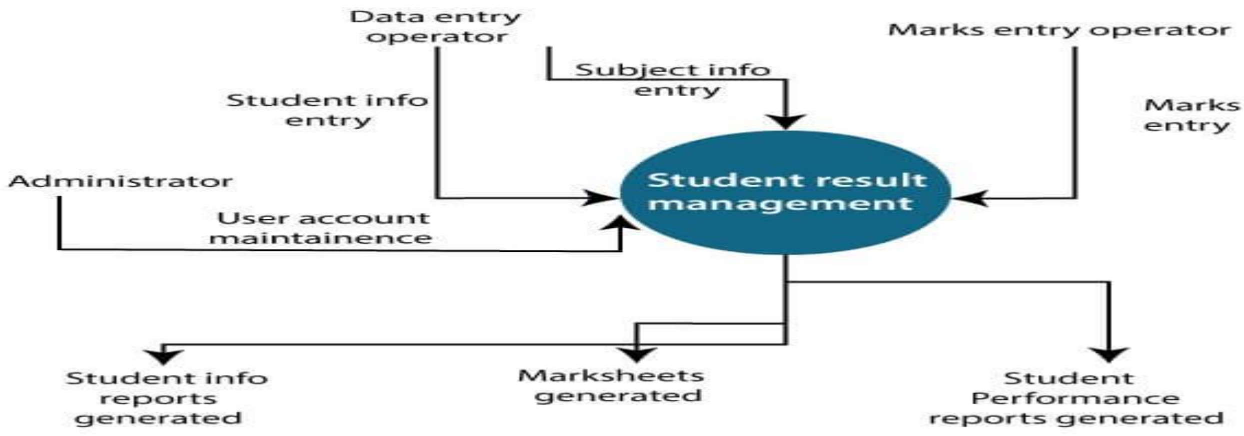
Circle: A circle (bubble) shows a process that transforms data inputs into data outputs.

Data Flow: A curved line shows the flow of data into or out of a process or data store.

Data Store: A set of parallel lines shows a place for the collection of data items. A data store indicates that the data is stored which can be used at a later stage or by the other processes in a different order. The data store can have an element or group of elements.

Source or Sink: Source or Sink is an external entity and acts as a source of system inputs or sink of system outputs.

Example of DFD Diagram on Student Result Management



ER-DAIGRAM

ER-modelling is a data modelling method used in software engineering to produce a conceptual data model of an information system. Diagrams created using this ER-modeling method are called Entity-Relationship Diagrams or ER diagrams or ERDs.

Components of ER Diagram:

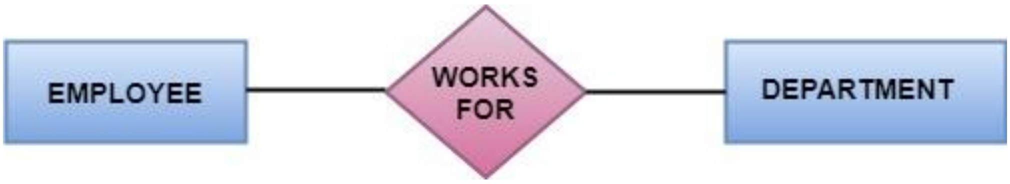
1.Entity

2.Attribute

3.Relationship

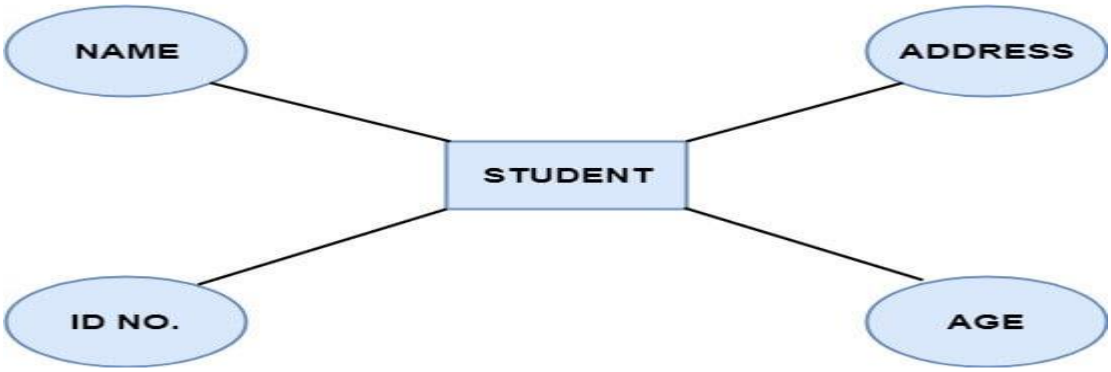
1.Entity:

An entity can be a real-world object, either animate or inanimate, that can be merely identifiable. An entity is denoted as a rectangle in an ER diagram. For example, in a school database, students, teachers, classes, and courses offered can be treated as entities.



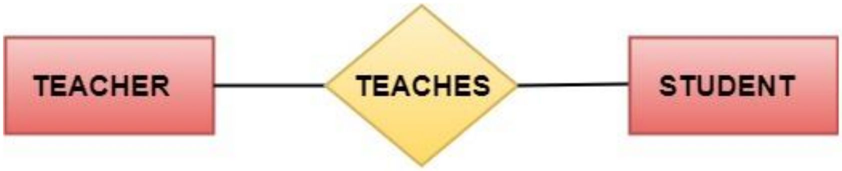
2.Attribute:

Entities are denoted utilizing their properties, known as attributes. All attributes have values. For example, a student entity may have name, class, and age as attributes.



3.Relation ship

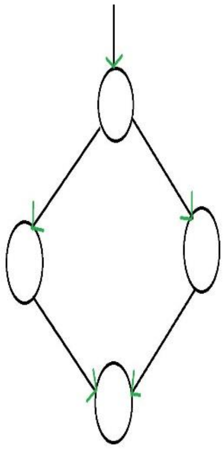
The association among entities is known as relationship. Relationships are represented by the diamond-shaped box. For example, an employee works_at a department, a student enrolls in a course. Here, Works_at and Enrolls are called relationships.



Control Flow Diagram:

A **control-flow diagram** (**CFD**) is a diagram to describe the control flow of a business process, process or review.

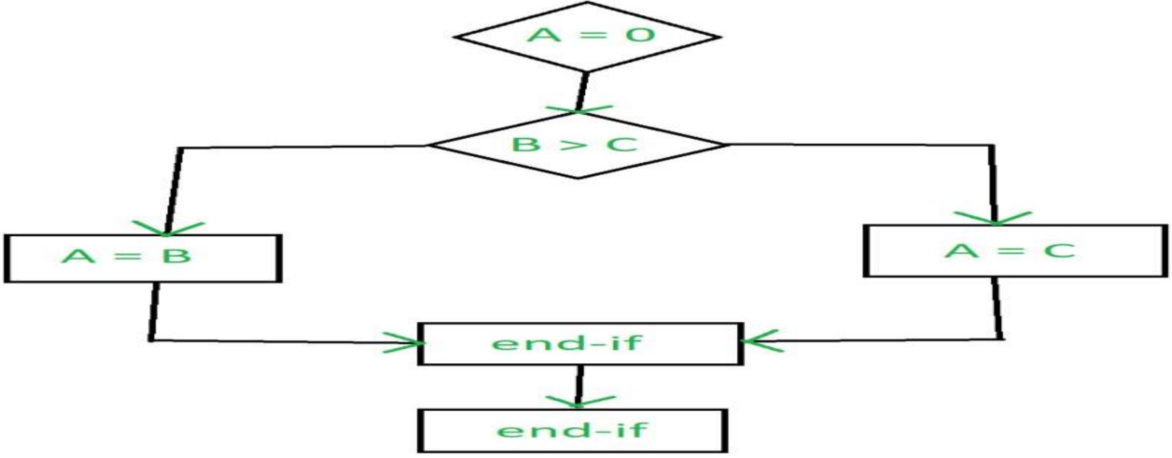
Example of Control Flow :



If-then-else

Example of Control flow on Simple program

```
if  A = 10 then
  if B > C
     A = B
  else A = C
  endif
  endif
print A, B, C
```


A = 0
B > C
A = B
A = C
end-if
end-if

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Experiment-2

Course Management System:

Draw the DFD and E-R Diagrams for Course Management Systems.

DFD-level 01:

In this system we have to manage following activities

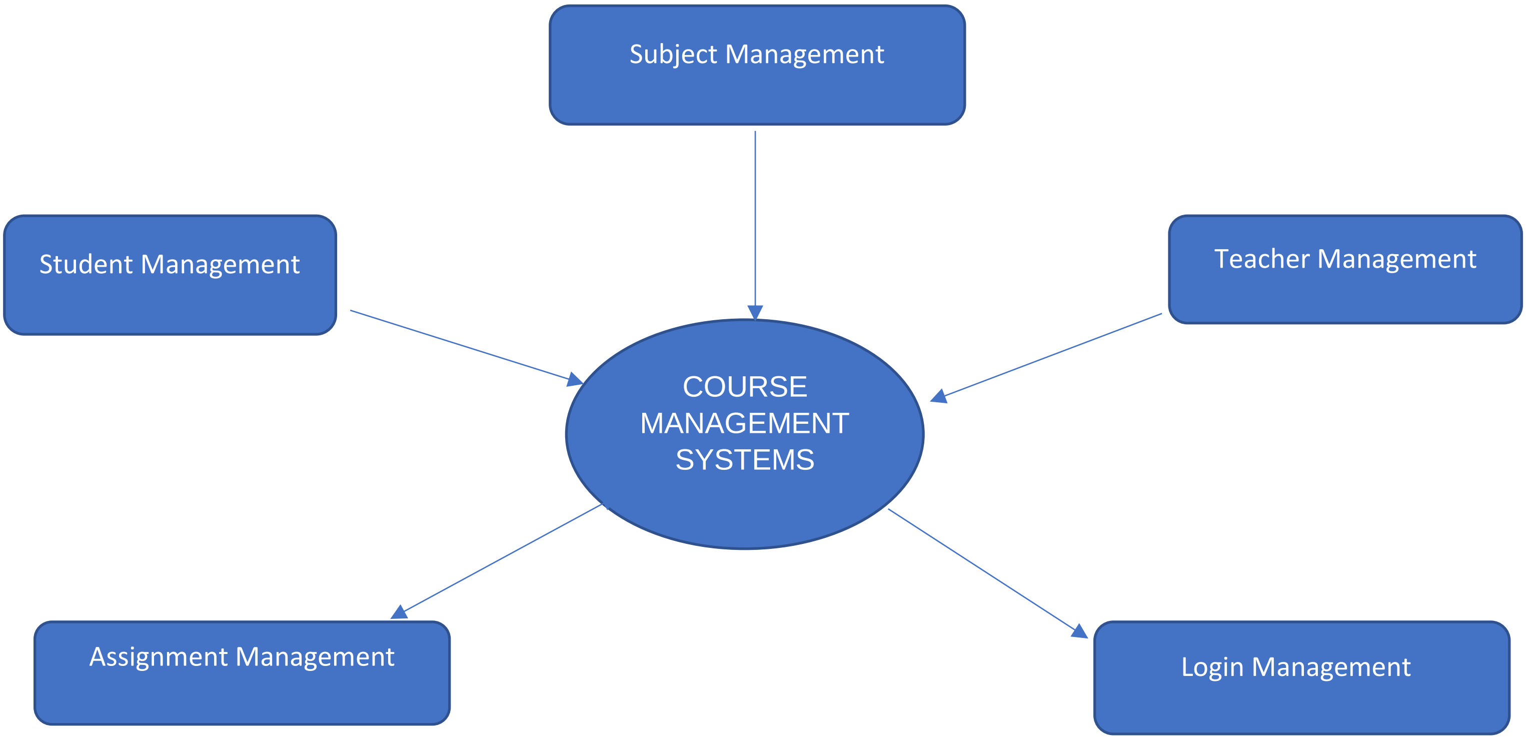
1.Manage All students

2.Manage All Teachers

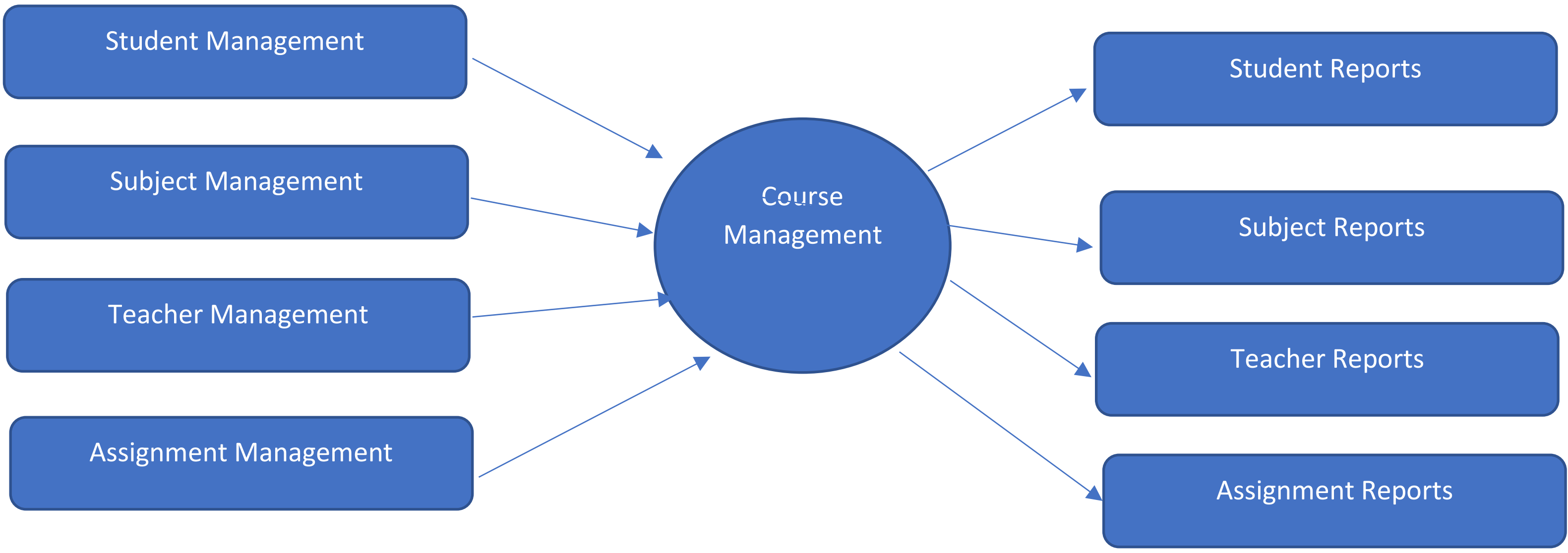
3.Manage All users

4.Manage All Subjects

5.Manage All Assignment

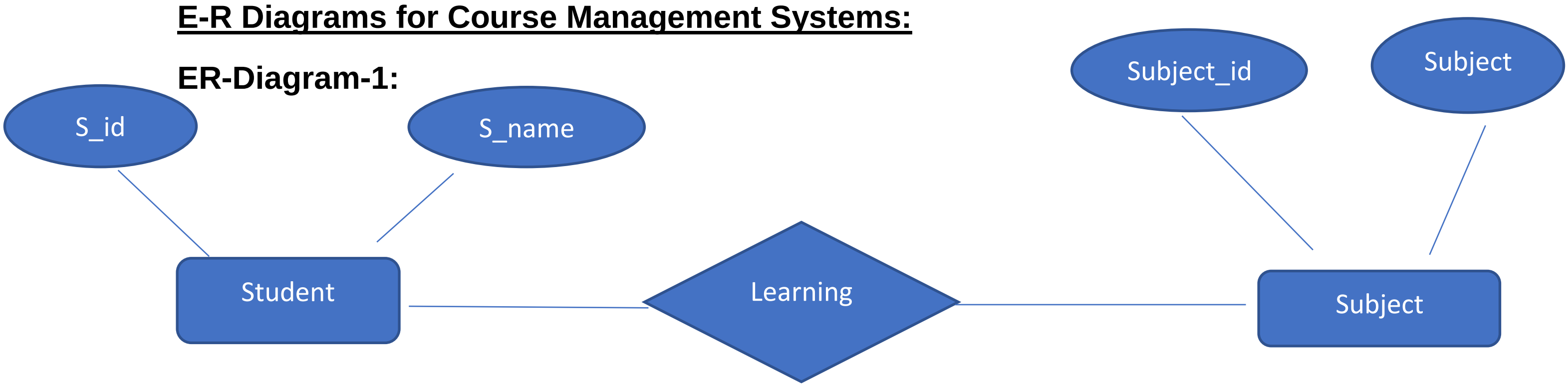


DFD LEVEL 1:in this level one step deeper .it may require more functionalities of Course Registration or reach the necessary level of details



E-R Diagrams for Course Management Systems:

ER-Diagram-1:



In above ER-Diagram we draw the relation ship between student entity and subject entity

ER-Diagram-2:

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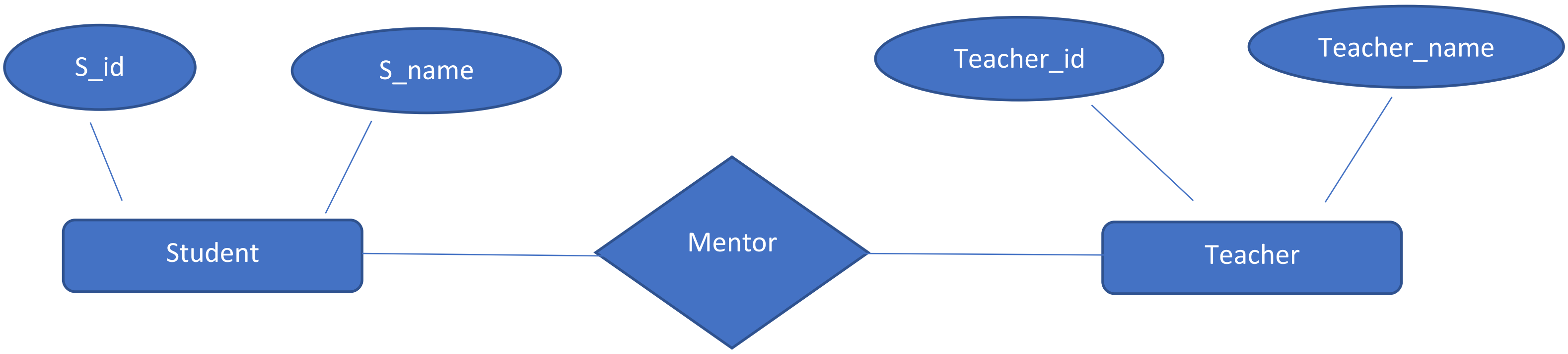
In ER-Diagram two we find the relation between teacher and student entities



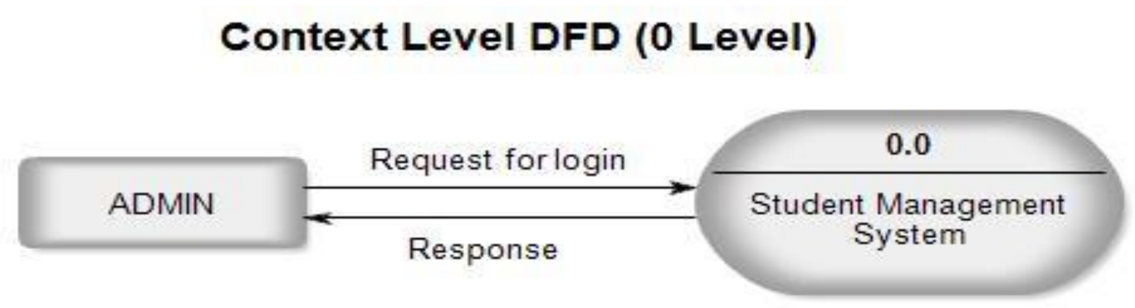
Experiment-3

Student Marks Analysis System:

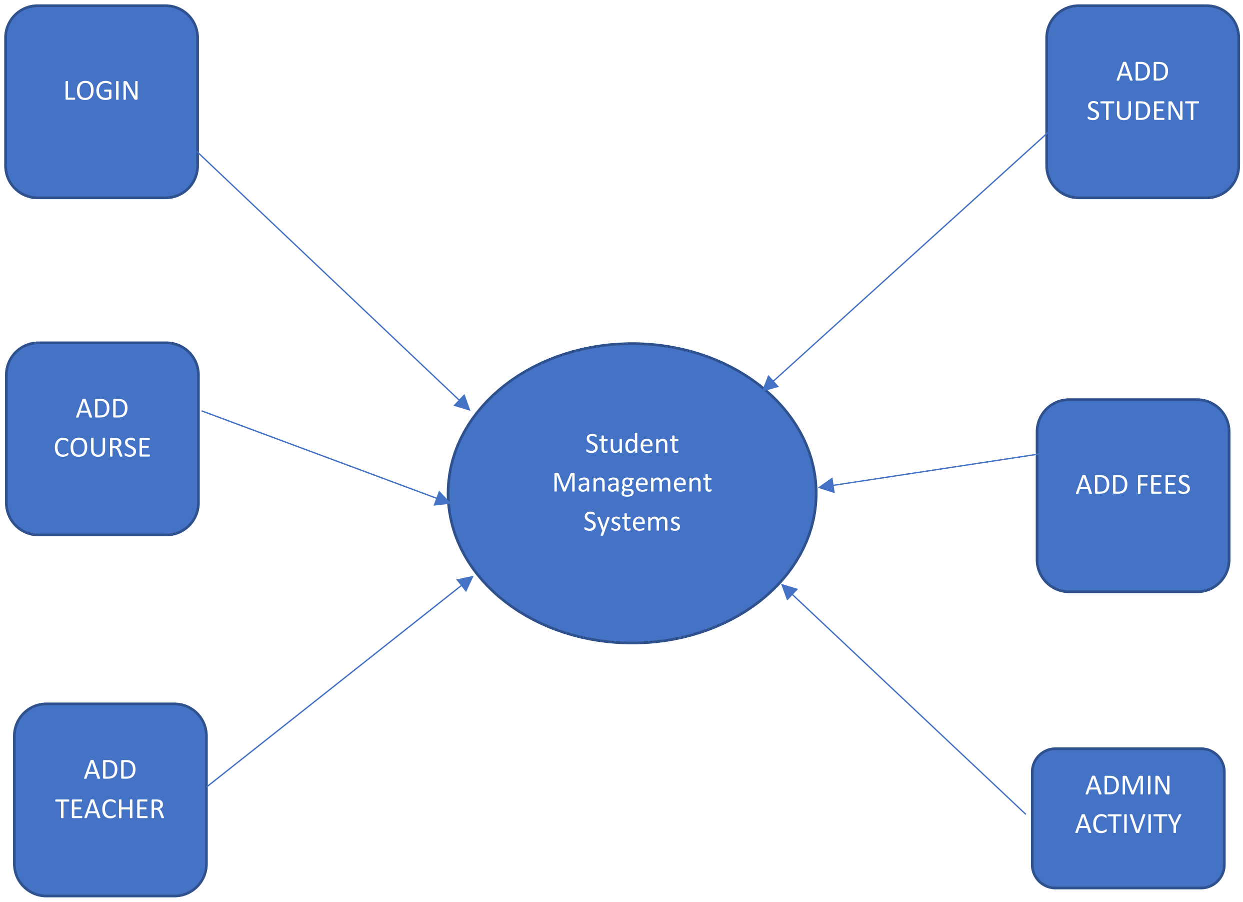
DFD and E-R diagrams for Student marks analysis system:

0 Level Data Flow Diagrams:

The 0 level data flow diagram is also known as context diagram. The context diagram describes the whole system. in this level describe the all user modules



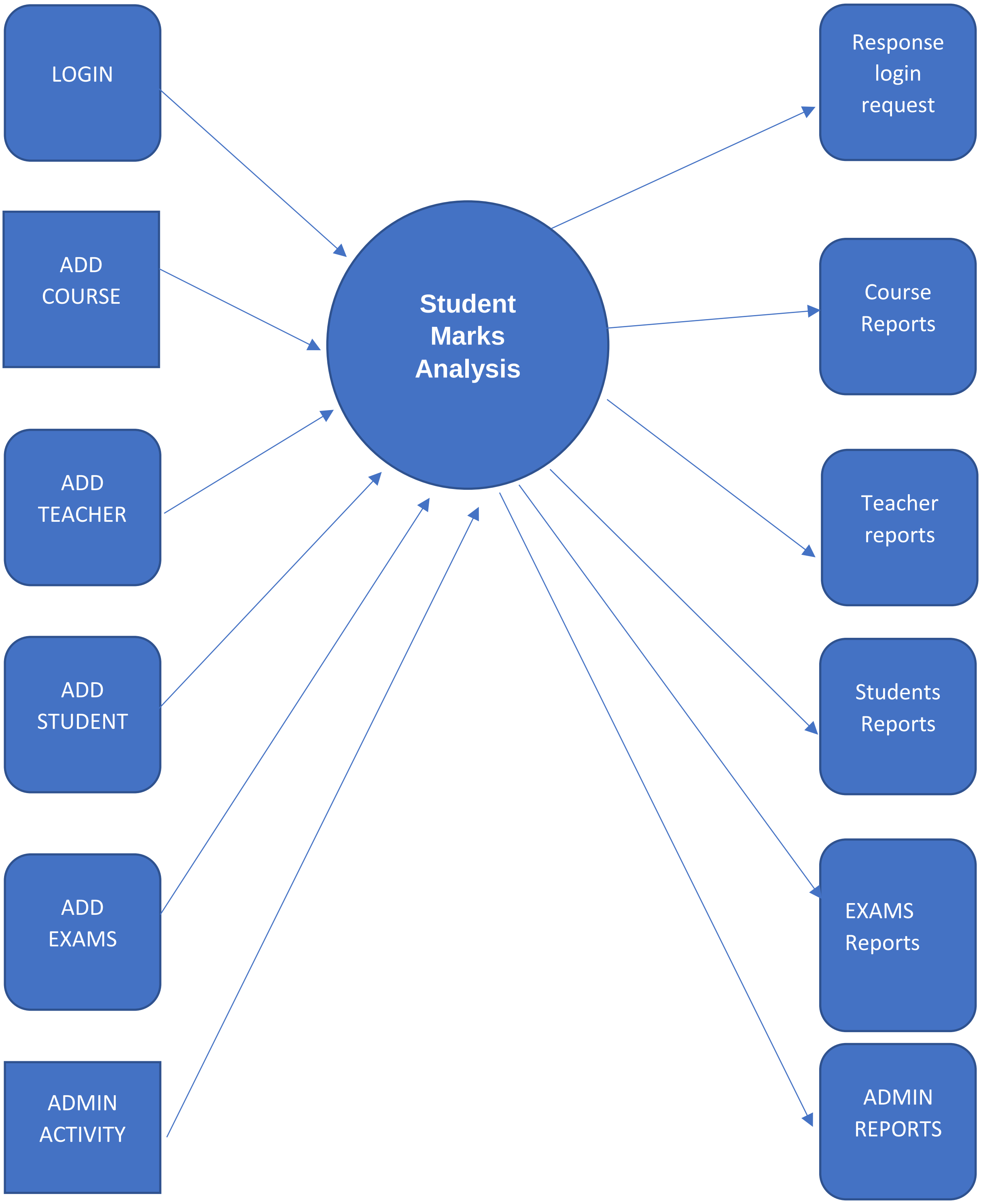
1 Level data Flow Diagrams:



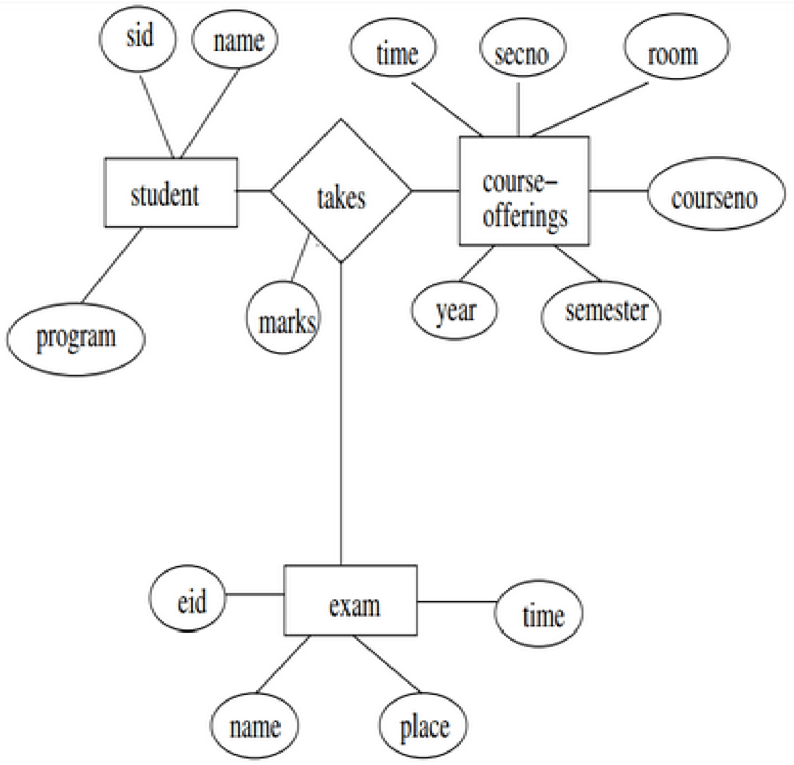
DFD level-01 describe the functionality of input modules In the systems

DFD level 02:

DFD level 02 describe the input and out put functionality in the system



ER-MODEL FOR STUDENTS MARKS ANALYSIS MANAGEMENT



Experment-3

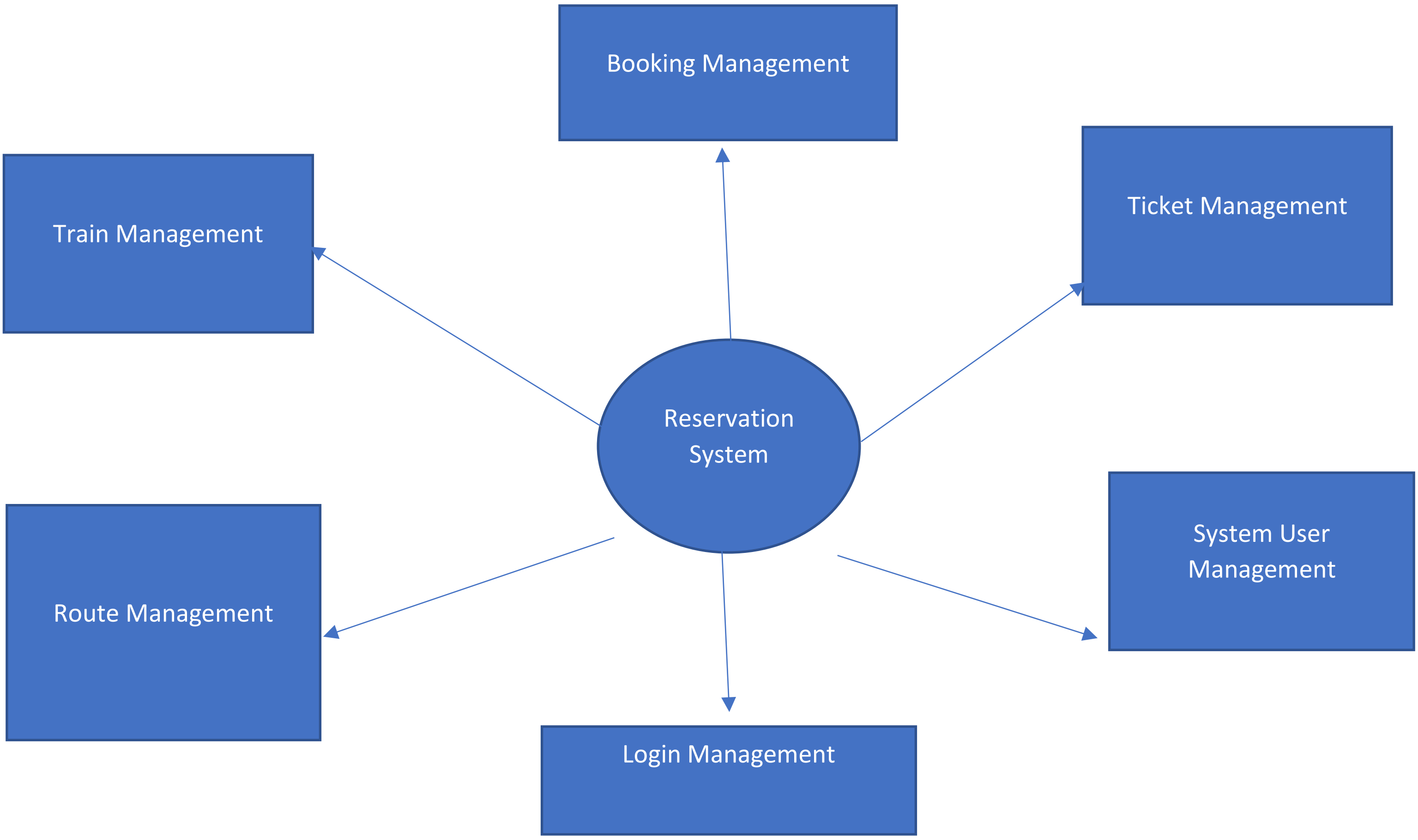
Online reservation System

The is the zero level DFD OF Railway reservation system, where we have elaborated the high-level process of railway reservation. it’s a basic overview of the whole railway reservation system or process being analysed or model

Process of Railway reservation:

- Managing all the Trains
- Managing all the Booking
- Managing all the Ticket
- Managing all the Train Route
- Managing all the Train Schedule
- Managing all the Customer
- Manging all the Payment
- Manging all the logins

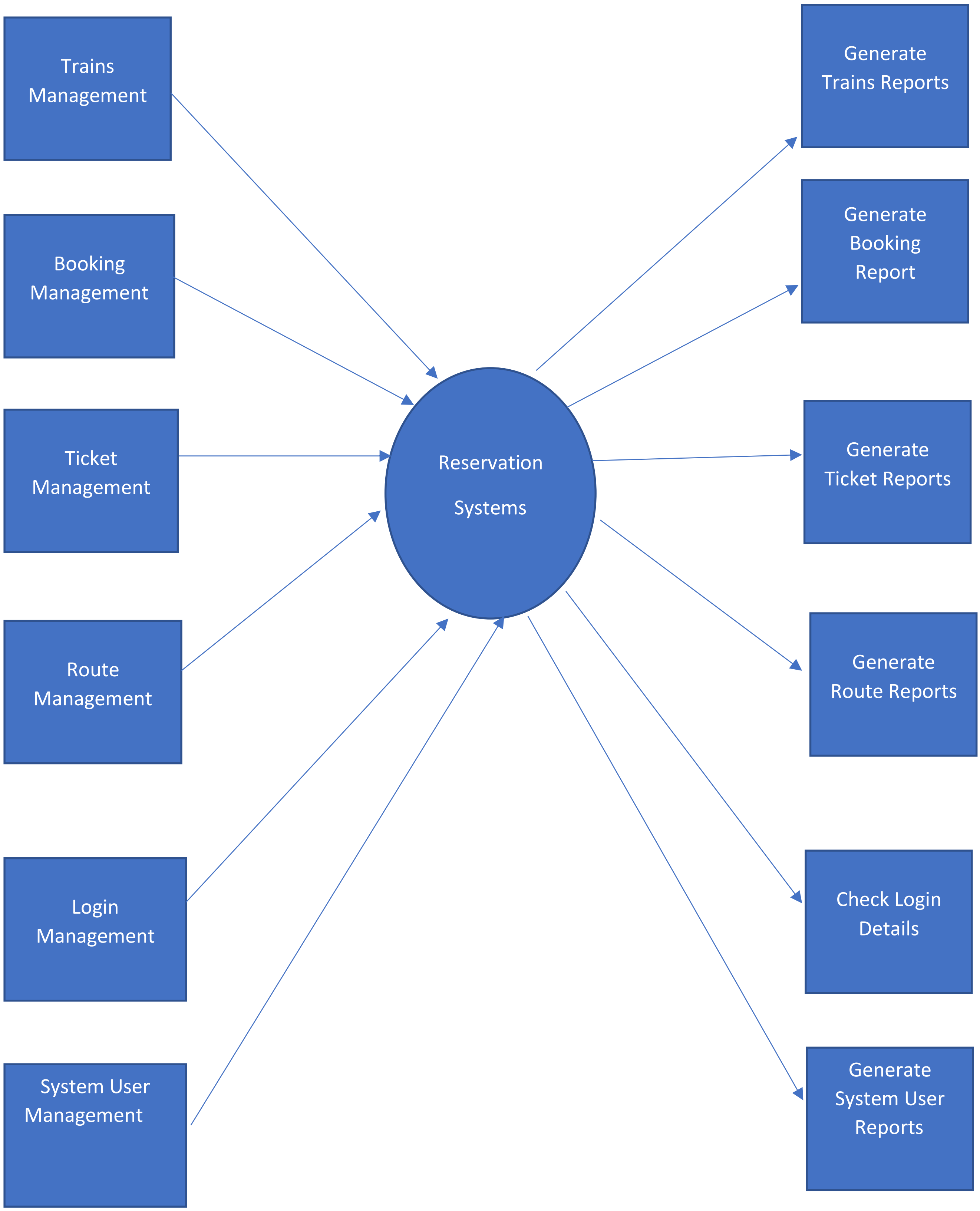
DFD Diagrams for Online reservation system



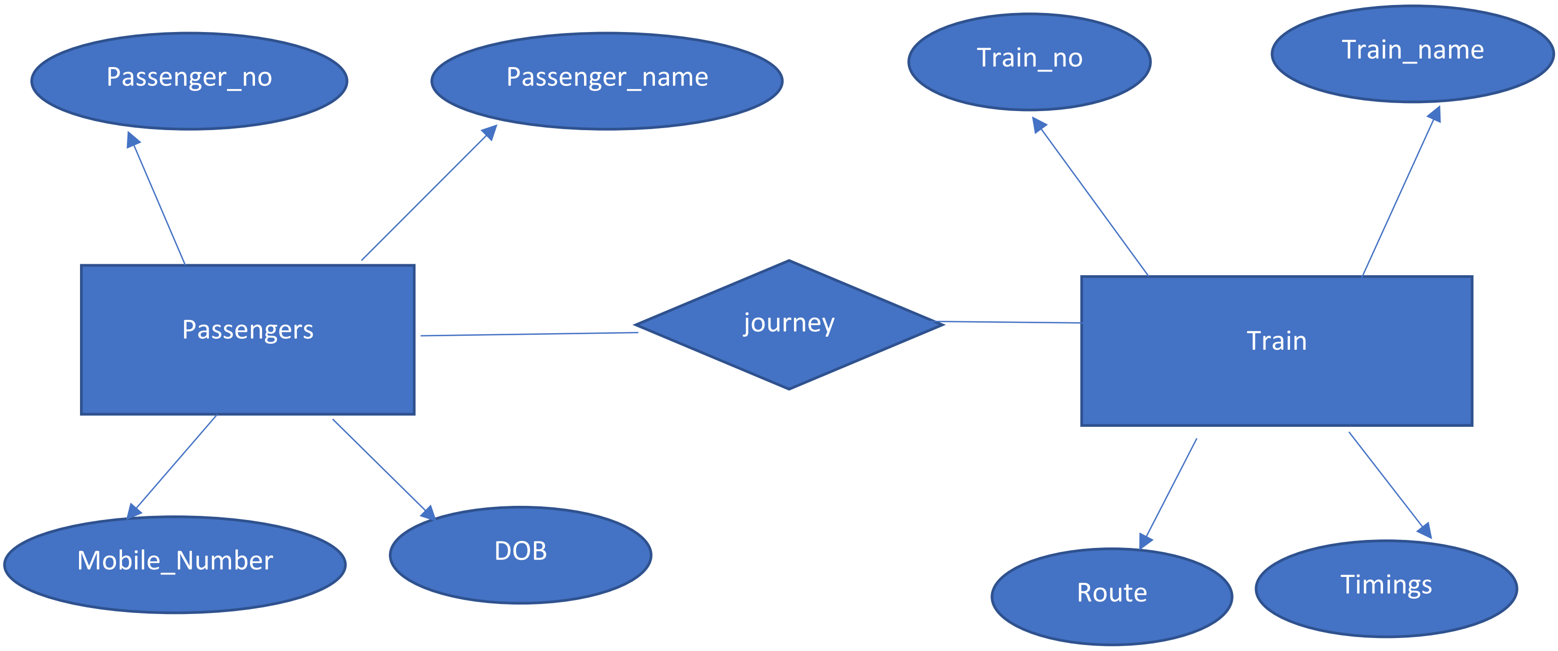
Data Flow Diagram (Level-01)

First level DFD (1st level) of Railway Reservation System shows how the system is divided into sub-systems(processes):

- Processing Trains records and generate report of all trains
- Processing Booking records and generate report of all Booking
- Processing Ticket records and generate report of all ticket
- Processing Train schedule records and generate reportof all train schedule
- Processing Train Route records and generate report of all Train Route
- Processing Customer records and generate report of all Customer
- Processing Payment records and generate report of all Payment


Trains Management
Booking Management
Ticket Management
Route Management
Login Management
System User Management
Reservation Systems
Generate Trains Reports
Generate Booking Report
Generate Ticket Reports
Generate Route Reports
Check Login Details
Generate System User Reports

ER-Diagram for Online reservation system:



Experment-4

Stock Maintenance

Zero level DFD:

This is the Zero level DFD of stock management system , where we have elaborated the high level process of stock. It’s basic overview of the whole stock management system or process being analysed .

Managing all the stock

managing all the product

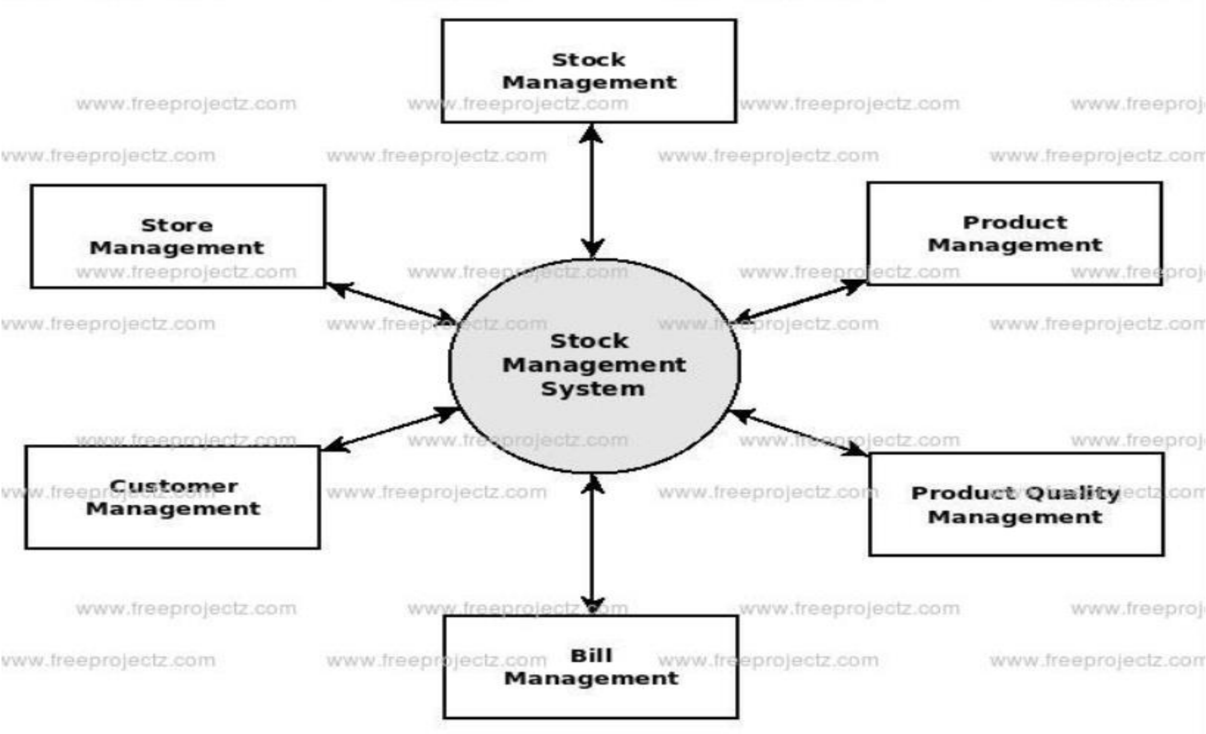
managing all the product quality

managing all the bill

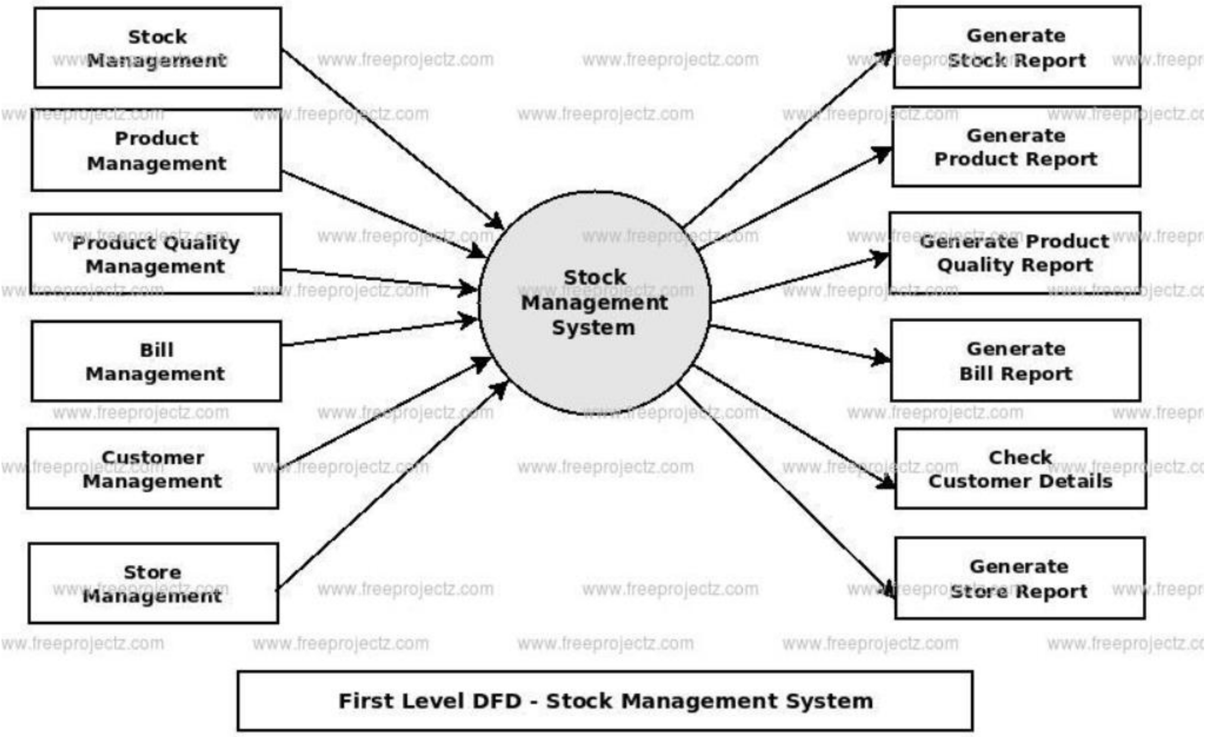
managing all the customer

managing all the store

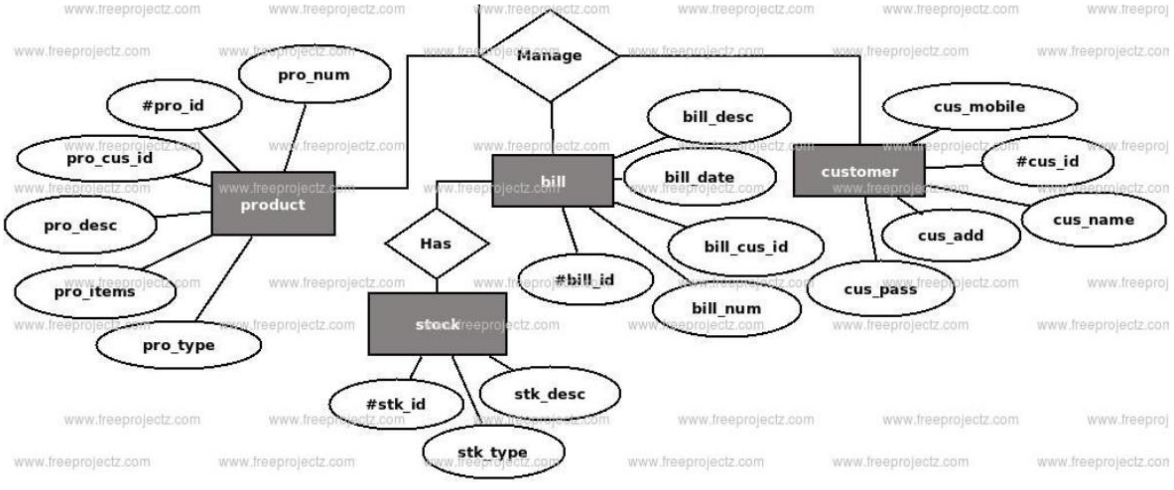
managing all the login



Level -1 DFD



ER-Diagram for Stock Maintenance


Manage
pro_num
#pro_id
pro_cus_id
product
pro_desc
pro_items
pro_type
bill_desc
bill
bill_date
bill_cus_id
#bill_id
bill_num
Has
stock
#stk_id
stk_desc
stk_type
cus_mobile
customer
#cus_id
cus_name
cus_add
cus_pass