An object’s state transition diagram is like this



Given a table with this schema that stores the above

ID (Number)

ProjectRequest (string)

State (Number)

StateEntryTime (DateTime)

A given project may have gone through multiple states and as a result have multiple states stored with a different StateEntryTime.

Q1) Write a query to get the following

How many objects in each of the above states as current final known state

New -- ??

Submitted -- ??

Prospect --??

Approved -- ??

Rejected -- ??

**ANSWER:**

**-- Pick the item with latest StateEntryTime for each ProjectID**

**-- Using INNER JOIN**

SELECT State,COUNT(T1.ProjectID) as StateCount

FROM MOCK\_DATA T1

INNER JOIN (

SELECT ProjectID, MAX(StateEntryTime) as MaxDate

FROM MOCK\_DATA

GROUP BY ProjectID

) T2 ON T1.StateEntryTime = T2.MaxDate

GROUP BY State

;

**-- Using RANK() method in MySQL**

SELECT State, COUNT(T1.ProjectID) as StateCount

FROM (SELECT

ProjectID,

State,

RANK() OVER(PARTITION BY ProjectID ORDER BY StateEntryTime DESC) as Final

FROM MOCK\_DATA

) as T1

WHERE Final=1

GROUP BY State;

**-- Can further add this ORDER BY with CASE clauses to produce State in order**

ORDER BY

CASE when State='Rejected' Then 5 END,

CASE when State='Approved' Then 4 END,

CASE when State='Prospect' Then 3 END,

CASE when State='Submitted' Then 2 END,

CASE when State='New' Then 1 END

;

**OUTPUT: (same for both queries)**

|  |  |
| --- | --- |
| **State** | **StateCount** |
| New | 6 |
| Submitted | 4 |
| Prospect | 4 |
| Approved | 4 |
| Rejected | 2 |

‘Q2) How would you simplify the query if only Approved and Rejected are needed ?

Approved -- ??

Rejected -- ??

**ANSWER:**

SELECT State, COUNT(ProjectID) as Count

FROM MOCK\_DATA

WHERE State='Approved' OR State='Rejected'

GROUP BY State

;

**// If there are multiple distinct types its preferable to use IN clause**

SELECT State, COUNT(ProjectID) as Count

FROM MOCK\_DATA

WHERE State IN ('Rejected', 'Approved')

GROUP BY State

;

**OUTPUT: (same for both queries)**

|  |  |
| --- | --- |
| **State** | **Count** |
| Approved | 4 |
| Rejected | 2 |

Q3) Write a query to get the following result

ID New Submitted Prospect Approved Rejected

1 2019-01-01 2019-01-11 2019-01-21 2019-01-31

2 2019-03-03 2019-04-05 2019-04-06 2019-04-10

3 2019-04-04 2019-04-04 2019-04-05

4 2019-05-18 2019-05-20

5 2019-05-21

**ANSWER:**

*-- Using PIVOT function from SQL Server*

SELECT

ProjectID as ID,

isnull(CAST([New] AS varchar),'') as 'New', *-- Replaces null values with empty string.*

isnull(CAST([Submitted] AS varchar),'') as 'Submitted',

isnull(CAST([Prospect] AS varchar),'') as 'Prospect',

isnull(CAST([Approved] AS varchar),'') as 'Approved',

isnull(CAST([Rejected] AS varchar),'') as 'Rejected'

FROM MOCK\_DATA

PIVOT (

MAX (StateEntryTime)

FOR State

IN (New, Submitted, Prospect, Approved, Rejected)

)

AS PIVOTTABLE

ORDER BY ProjectID

;

**// This solution is atleast twice as efficient as the former**

*-- Using CASE statements from MySQL*

SELECT

ProjectID as ID,

MAX(CASE when State='New' Then StateEntryTime ELSE '' END) as New,

MAX(CASE when State='Submitted' Then StateEntryTime ELSE '' END) as Submitted,

MAX(CASE when State='Prospect' Then StateEntryTime ELSE '' END) as Prospect,

MAX(CASE when State='Approved' Then StateEntryTime ELSE '' END) as Approved,

MAX(CASE when State='Rejected' Then StateEntryTime ELSE '' END) as Rejected

FROM MOCK\_DATA

GROUP BY ID

;

**OUTPUT: (same for both queries)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ProjectID** | **New** | **Submitted** | **Prospect** | **Approved** | **Rejected** |
| 1 | 1999-11-29 | 2017-04-17 | 1998-01-18 |  | 2003-04-11 |
| 2 | 2010-01-08 | 2003-07-22 | 2011-03-17 | 2009-02-08 |  |
| 3 | 2004-11-10 | 2002-03-11 | 2002-08-09 |  |  |
| 4 | 1999-10-08 | 2015-08-14 |  |  |  |
| 5 | 1996-03-03 |  |  |  |  |
| 6 | 1997-07-09 | 2002-07-10 | 2005-07-03 |  |  |
| 7 | 2004-11-09 | 2012-07-23 | 2012-02-22 |  | 2007-01-20 |
| 8 | 2003-12-22 | 2003-06-21 | 2001-10-12 | 2000-10-23 |  |

Q4) Given a table with 4 cols (Emp\_id, name, date\_of\_joining, dept\_id)

1. write a query to show the number of employees in each department that have more than 50 employees sorted desc on strength of employees.

**ANSWER:**

SELECT dept\_id, COUNT(Emp\_id) AS 'Employee Count'

FROM MOCK\_DATA\_2

GROUP BY dept\_id

HAVING COUNT(Emp\_id) > 50

ORDER BY COUNT(Emp\_id) DESC;

**OUTPUT:**

**// In output below COUNT(dept\_id) > 5 was used**

|  |  |
| --- | --- |
| **dept\_id** | **Employee Count** |
| 3 | 18 |
| 4 | 10 |
| 2 | 10 |
| 1 | 8 |

1. Generate a serial number for this result set as part of the query

**ANSWER:**

**// Using variables - less costly in terms of compute time**

*-- Using mySQL*

SET @row\_number = 0;

SELECT

(@row\_number:=@row\_number + 1) AS 'Serial\_No',

dept\_id AS 'Department ID',

EmployeeCount

FROM (

SELECT dept\_id, COUNT(Emp\_id) AS 'EmployeeCount'

FROM MOCK\_DATA\_2

GROUP BY dept\_id

HAVING COUNT(dept\_id) > 50

ORDER BY COUNT(dept\_id) DESC

) as R

;

**// Using row\_number() function**

-- Using SQL Server

SELECT

ROW\_NUMBER() OVER(ORDER BY EmployeeCount DESC) AS Serial\_No,

dept\_id AS DepartmentID,

EmployeeCount

FROM (

SELECT dept\_id, COUNT(Emp\_id) AS EmployeeCount

FROM MOCK\_DATA\_2

GROUP BY dept\_id

HAVING COUNT(Emp\_id) > 50

) as R

ORDER BY EmployeeCount DESC

;

**OUTPUT: (same for both queries)**

**// In output below COUNT(dept\_id) > 5 was used**

|  |  |  |
| --- | --- | --- |
| **Serial No** | **Department ID** | **Employee Count** |
| 1 | 3 | 18 |
| 2 | 4 | 10 |
| 3 | 2 | 10 |
| 4 | 1 | 8 |

1. The records now have a **repeated field called Project, Role** where both are enums. For example, SalesProject:Developer, OrderProject:Analyst, QuotingProject:Manager, Enhance the query to find only those departments where number of managers is more than 10.

Table Emp:

* Emp\_id,
* name,
* date\_of\_joining,
* Dept\_id,
* ProjectRoleEnum
  + Project,
  + Role

**ANSWER:**

**// Video for BigQuery Nested and Repeated Fields**

**//****<https://www.youtube.com/watch?v=STo98QUKDS8>**

**//****<https://cloud.google.com/bigquery/docs/legacy-nested-repeated>**

**Given Table Example:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Emp\_id** | **name** | **date\_of\_joining** | **Dept\_id** | **ProjectRoleEnum.Project** | **ProjectRoleEnum.Role** |
| **1** | **1** | **John** | **2000-12-01** | **123** | **Sales** | **Develepor** |
|  |  |  |  | **Order** | **Analyst** |
|  |  |  |  | **Quoting** | **Manager** |

**After Unnesting:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Emp\_id** | **name** | **date\_of\_joining** | **Dept\_id** | **ProjectRoleEnum.Project** | **ProjectRoleEnum.Role** |
| **1** | **1** | **John** | **2000-12-01** | **123** | **Sales** | **Develepor** |
| **2** | **1** | **John** | **2000-12-01** | **123** | **Order** | **Analyst** |
| **3** | **1** | **John** | **2000-12-01** | **123** | **Quoting** | **Manager** |

**// Using UNNEST**

SELECT Dept\_id, Count(\*) AS ManagerCount

FROM (

SELECT Dept\_id, Role

FROM MOCK\_DATA\_4C

CROSS JOIN UNNEST(ProjectRoleEnum) as ProjectRoleEnum

WHERE Role = 'Manager'

)

GROUP BY Dept\_id

HAVING HAVING(\*) > 10

;

**// Using FLATTEN (Legacy BigQuery SQL)**

SELECT Dept\_id, COUNT(\*) AS ManagerCount

FROM

(

SELECT Dept\_id, ProjectRoleEnum.Role

FROM (FLATTEN(MOCK\_DATA\_4C, ProjectRoleEnum))

WHERE ProjectRoleEnum.Role = "Manager"

)

GROUP BY Dept\_id

HAVING COUNT(\*) > 10;

**OUTPUT:**

|  |  |
| --- | --- |
| **Dept\_id** | **ManagerCount** |
| **10** | **24** |
| **7** | **20** |
| **3** | **19** |
| **4** | **18** |
| **11** | **12** |

Q5) Given two tables:

Table 1: Projects (Project ID, Manager, Project Name, Status)

Table 2: Projects Risks (Project ID, Risk Name, Date)

Write a query that lists each manager with their latest risk per project.

**ANSWER:**

**Assumptions:**

· A manager can have several projects under him.

· The solution picks the latest RISK\_NAME for EACH Manager and each of their Project.

· One or multiple project(s) are picked for every manager which has the latest RISK date.

**// Using row\_number() function in SQL Server**

SELECT Manager, Project\_Name, Risk\_Name, Date

FROM

(

SELECT

Manager,

Project\_Name,

Risk\_Name,

Date,

RANK() OVER (PARTITION BY Manager ORDER BY Date DESC) AS Latest\_Risk

FROM Projects

INNER JOIN ProjectsRisks ON Projects.Project\_ID = ProjectsRisks.Project\_ID

) as SUB

WHERE Latest\_Risk = 1

;

**Alternative Assumptions:**

· A manager can have several projects under him.

· The solution picks the latest RISK\_NAME for EACH Manager but ONLY one Project.

· Only one project is picked for every manager which has the latest RISK date.

SELECT Manager, Project\_Name, Risk\_Name, MAX(Date) as Latest\_Risk

FROM ProjectsRisks sub2

INNER JOIN Projects ON sub2.Project\_ID = Projects.Project\_ID

GROUP BY Manager

ORDER BY Date DESC

;

**OUTPUTS:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Manager** | **Project\_Name** | **Risk\_Name** | **Date** |
| **Danit Fausch** | **Veribet** | **Steller's sea lion** | **2014-01-19** |
| **Dianna Stanistrete** | **Solarbreeze** | **Wallaroo, common** | **2015-11-11** |
| **Julian Duferie** | **Fixflex** | **Crab, sally lightfoot** | **2000-12-17** |
| **Tally Ismail** | **Holdlamis** | **Black and white colobus** | **2015-08-31** |
| **Weider McCloughlin** | **Greenlam** | **Musk ox** | **2016-11-28** |

**APPENDIX:**

**MOCK\_DATA (Q1, Q2, Q3)**

create table MOCK\_DATA (

ProjectID INT,

ProjectName VARCHAR(50),

State VARCHAR(9),

StateEntryTime DATE

);

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (1, 'Tresom', 'New', '1999-11-29');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (1, 'Tresom', 'Submitted', '2017-04-17');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (1, 'Tresom', 'Prospect', '1998-01-18');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (1, 'Tresom', 'Rejected', '2019-04-11');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (2, 'Voltsillam', 'New', '2010-01-08');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (2, 'Voltsillam', 'Submitted', '2003-07-22');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (2, 'Voltsillam', 'Prospect', '2011-03-17');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (2, 'Voltsillam', 'Approved', '2019-02-08');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (3, 'Flexidy', 'New', '2004-11-10');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (3, 'Flexidy', 'Submitted', '2002-03-11');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (3, 'Flexidy', 'Prospect', '2012-08-09');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (4, 'Bytecard', 'New', '1999-10-08');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (4, 'Bytecard', 'Submitted', '2015-08-14');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (5, 'Cardify', 'New', '1996-03-03');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (6, 'Aerified', 'New', '1997-07-09');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (6, 'Aerified', 'Submitted', '2002-07-10');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (6, 'Aerified', 'Prospect', '2005-07-03');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (7, 'Tempsoft', 'New', '2004-11-09');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (7, 'Tempsoft', 'Submitted', '2012-07-23');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (7, 'Tempsoft', 'Prospect', '2012-02-22');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (7, 'Tempsoft', 'Rejected', '2017-01-20');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (8, 'Biodex', 'New', '2003-12-22');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (8, 'Biodex', 'Submitted', '2003-06-21');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (8, 'Biodex', 'Prospect', '2001-10-12');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (8, 'Biodex', 'Approved', '2010-10-23');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (9, 'Trippledex', 'New', '2006-04-24');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (10, 'Alphazap', 'New', '2009-02-26');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (11, 'Andalax', 'New', '2017-01-21');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (12, 'Wrapsafe', 'New', '2008-11-26');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (12, 'Wrapsafe', 'Submitted', '2007-09-04');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (12, 'Wrapsafe', 'Prospect', '2010-02-13');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (13, 'Pannier', 'New', '1998-11-28');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (13, 'Pannier', 'Submitted', '2007-09-12');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (14, 'Sonsing', 'New', '2009-12-06');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (14, 'Sonsing', 'Submitted', '2010-09-22');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (15, 'Hatity', 'New', '2014-05-05');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (16, 'Zathin', 'New', '1999-03-11');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (16, 'Zathin', 'Submitted', '2003-05-02');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (16, 'Zathin', 'Prospect', '2001-06-08');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (16, 'Zathin', 'Approved', '2011-05-14');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (17, 'Cookley', 'New', '2002-05-25');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (18, 'Opela', 'New', '2018-05-25');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (18, 'Opela', 'Submitted', '2019-12-27');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (19, 'Toughjoyfax', 'New', '2002-06-08');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (19, 'Toughjoyfax', 'Submitted', '2019-03-16');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (19, 'Toughjoyfax', 'Prospect', '2020-05-04');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (20, 'Keylex', 'New', '2010-05-21');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (20, 'Keylex', 'Submitted', '2001-07-03');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (20, 'Keylex', 'Prospect', '2017-05-15');

insert into MOCK\_DATA (ProjectID, ProjectName, State, StateEntryTime) values (20, 'Keylex', 'Approved', '2019-07-29');

**MOCK\_DATA\_2 (Q4(a), Q4(b))**

create table MOCK\_DATA\_2 (

Emp\_id INT,

emp\_name VARCHAR(50),

date\_of\_joining DATE,

dept\_id VARCHAR(1)

);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (1, 'Tally Ismail', '2018-02-02', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (2, 'Danit Fausch', '2008-05-10', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (3, 'Julian Duferie', '2003-09-09', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (4, 'Ailyn McDonnell', '2001-10-31', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (5, 'Weider McCloughlin', '2010-10-26', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (6, 'Flory Mansell', '2007-06-09', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (7, 'Dianna Stanistrete', '2009-07-02', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (8, 'Maible Dickman', '1997-04-22', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (9, 'Wenonah Fishleigh', '2011-08-10', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (10, 'Wilma Overton', '2009-01-06', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (11, 'Stormi Attenburrow', '2010-05-01', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (12, 'Keven Berkelay', '2007-04-23', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (13, 'Alfreda Girk', '2003-12-04', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (14, 'North Shwalbe', '2002-10-04', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (15, 'Levin Synnot', '2000-08-09', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (16, 'Dukie Le Moucheux', '1995-12-31', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (17, 'Glyn O''Caine', '2004-05-17', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (18, 'Carlos Larimer', '2003-12-07', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (19, 'Stanislas McCanny', '2010-11-20', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (20, 'Marleen Goude', '1999-06-12', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (21, 'Coleen Grundon', '2002-03-13', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (22, 'Pru Giberd', '2018-07-03', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (23, 'La verne Hans', '2008-11-27', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (24, 'Cozmo Sygroves', '2005-06-07', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (25, 'Johnathan Stirland', '2018-09-03', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (26, 'Tedi Raine', '2003-05-19', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (27, 'Alphonso Haveline', '2018-03-10', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (28, 'Inez Robertot', '2007-11-28', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (29, 'Yehudi Kersley', '2012-12-16', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (30, 'Eustace Heyworth', '2001-08-31', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (31, 'Alameda Strafen', '2007-05-14', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (32, 'Arlie Have', '2007-08-05', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (33, 'Johnette Dilawey', '2014-02-21', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (34, 'Anstice Baudassi', '2017-05-02', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (35, 'Barbabas Palle', '2001-11-10', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (36, 'Annadiane Huckabe', '2012-01-16', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (37, 'Estell McVicker', '2005-10-27', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (38, 'Nathalia Whyman', '2017-11-04', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (39, 'Dion Di Bartolomeo', '2001-05-02', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (40, 'Bebe Crossman', '2018-08-13', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (41, 'Jessalyn MacCague', '2008-08-07', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (42, 'Vanda Tooting', '2004-05-04', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (43, 'Jammie Betton', '2018-01-02', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (44, 'Gwennie Quesne', '2012-09-17', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (45, 'Archie Rootham', '2008-09-25', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (46, 'Lexi Foucard', '1998-01-11', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (47, 'Zelma Hasney', '2014-03-29', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (48, 'Hillery Gillmore', '2015-12-09', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (49, 'Joela Daldry', '2011-05-10', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (50, 'Vinny Lineker', '1998-09-04', 3);

**MOCK\_DATA\_4C (Q4(c))**

create table MOCK\_DATA\_2 (

Emp\_id INT,

emp\_name VARCHAR(50),

date\_of\_joining DATE,

dept\_id VARCHAR(1)

);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (1, 'Tally Ismail', '2018-02-02', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (2, 'Danit Fausch', '2008-05-10', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (3, 'Julian Duferie', '2003-09-09', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (4, 'Ailyn McDonnell', '2001-10-31', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (5, 'Weider McCloughlin', '2010-10-26', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (6, 'Flory Mansell', '2007-06-09', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (7, 'Dianna Stanistrete', '2009-07-02', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (8, 'Maible Dickman', '1997-04-22', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (9, 'Wenonah Fishleigh', '2011-08-10', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (10, 'Wilma Overton', '2009-01-06', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (11, 'Stormi Attenburrow', '2010-05-01', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (12, 'Keven Berkelay', '2007-04-23', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (13, 'Alfreda Girk', '2003-12-04', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (14, 'North Shwalbe', '2002-10-04', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (15, 'Levin Synnot', '2000-08-09', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (16, 'Dukie Le Moucheux', '1995-12-31', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (17, 'Glyn O''Caine', '2004-05-17', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (18, 'Carlos Larimer', '2003-12-07', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (19, 'Stanislas McCanny', '2010-11-20', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (20, 'Marleen Goude', '1999-06-12', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (21, 'Coleen Grundon', '2002-03-13', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (22, 'Pru Giberd', '2018-07-03', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (23, 'La verne Hans', '2008-11-27', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (24, 'Cozmo Sygroves', '2005-06-07', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (25, 'Johnathan Stirland', '2018-09-03', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (26, 'Tedi Raine', '2003-05-19', 5);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (27, 'Alphonso Haveline', '2018-03-10', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (28, 'Inez Robertot', '2007-11-28', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (29, 'Yehudi Kersley', '2012-12-16', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (30, 'Eustace Heyworth', '2001-08-31', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (31, 'Alameda Strafen', '2007-05-14', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (32, 'Arlie Have', '2007-08-05', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (33, 'Johnette Dilawey', '2014-02-21', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (34, 'Anstice Baudassi', '2017-05-02', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (35, 'Barbabas Palle', '2001-11-10', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (36, 'Annadiane Huckabe', '2012-01-16', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (37, 'Estell McVicker', '2005-10-27', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (38, 'Nathalia Whyman', '2017-11-04', 4);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (39, 'Dion Di Bartolomeo', '2001-05-02', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (40, 'Bebe Crossman', '2018-08-13', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (41, 'Jessalyn MacCague', '2008-08-07', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (42, 'Vanda Tooting', '2004-05-04', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (43, 'Jammie Betton', '2018-01-02', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (44, 'Gwennie Quesne', '2012-09-17', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (45, 'Archie Rootham', '2008-09-25', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (46, 'Lexi Foucard', '1998-01-11', 3);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (47, 'Zelma Hasney', '2014-03-29', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (48, 'Hillery Gillmore', '2015-12-09', 2);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (49, 'Joela Daldry', '2011-05-10', 1);

insert into MOCK\_DATA\_2 (Emp\_id, emp\_name, date\_of\_joining, dept\_id) values (50, 'Vinny Lineker', '1998-09-04', 3);

**PROJECTS: (Q5)**

create table Projects (

Project\_ID INT,

Manager VARCHAR(18),

Project\_Name VARCHAR(50),

Status VARCHAR(10)

);

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (1, 'Dianna Stanistrete', 'Namfix', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (2, 'Dianna Stanistrete', 'Zathin', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (3, 'Julian Duferie', 'Fixflex', 'Completed');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (4, 'Weider McCloughlin', 'Bitchip', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (5, 'Danit Fausch', 'Transcof', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (6, 'Dianna Stanistrete', 'Asoka', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (7, 'Dianna Stanistrete', 'Solarbreeze', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (8, 'Danit Fausch', 'Sub-Ex', 'Dormant');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (9, 'Tally Ismail', 'Holdlamis', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (10, 'Dianna Stanistrete', 'Voyatouch', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (11, 'Dianna Stanistrete', 'Subin', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (12, 'Dianna Stanistrete', 'Home Ing', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (13, 'Weider McCloughlin', 'Lotstring', 'Dormant');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (14, 'Danit Fausch', 'Home Ing', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (15, 'Tally Ismail', 'Tampflex', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (16, 'Dianna Stanistrete', 'Solarbreeze', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (17, 'Tally Ismail', 'Fix San', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (18, 'Weider McCloughlin', 'Greenlam', 'Dormant');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (19, 'Tally Ismail', 'Span', 'Completed');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (20, 'Weider McCloughlin', 'Fix San', 'Inprogress');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (21, 'Tally Ismail', 'Lotstring', 'Dormant');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (22, 'Danit Fausch', 'Tin', 'ToStart');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (23, 'Danit Fausch', 'Veribet', 'Completed');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (24, 'Dianna Stanistrete', 'Rank', 'Completed');

insert into Projects (Project\_ID, Manager, Project\_Name, Status) values (25, 'Tally Ismail', 'Flowdesk', 'ToStart');

**PROJECTS\_RISKS (Q5)**

create table ProjectsRisks (

Project\_ID INT,

Risk\_Name VARCHAR(50),

Date DATE

);

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (1, 'Southern ground hornbill', '2008-04-09');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (2, 'Jacana, african', '2002-12-28');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (3, 'Crab, sally lightfoot', '2000-12-17');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (4, 'Stanley crane', '2003-01-11');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (5, 'Squirrel, smith''s bush', '2012-01-23');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (6, 'Peregrine falcon', '2006-11-26');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (7, 'Wallaroo, common', '2015-11-11');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (8, 'Butterfly, tropical buckeye', '2009-06-30');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (9, 'Black and white colobus', '2015-08-31');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (10, 'Rainbow lory', '2011-12-18');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (11, 'Squirrel, pine', '2009-04-03');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (12, 'Two-banded monitor', '2011-09-14');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (13, 'Bushpig', '2004-03-19');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (14, 'Armadillo, nine-banded', '2012-09-05');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (15, 'Capuchin, black-capped', '2012-02-26');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (16, 'Common brushtail possum', '2005-03-19');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (17, 'Tropical buckeye butterfly', '2010-01-03');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (18, 'Musk ox', '2016-11-28');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (19, 'Marten, american', '2014-11-06');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (20, 'Seal, common', '2005-11-15');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (21, 'Capybara', '2003-08-25');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (22, 'Vulture, bengal', '2004-05-12');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (23, 'Steller''s sea lion', '2014-01-19');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (24, 'White-nosed coatimundi', '2001-07-02');

insert into ProjectsRisks (Project\_ID, Risk\_Name, Date) values (25, 'Otter, canadian river', '2006-01-03');