**MS SQL Server**

# Assignment # 1

Topic: Tables, Constraint, Identity, Select Time: 2 Hr

A small IT firm designing business software for its clients wants to store and manage its data. It has identified following entities for which, it will maintain data.

# Clients

1. **Employees**

# Departments

1. **Projects**

# EmpProjectTasks \*

The tables below describe attributes for each entity. **Keep the table name same.**

# Clients

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Attribute Type** | **Constraint** | **Remarks** |
| Client\_ID | Integer | Primary Key |  |
| Cname | STRING(30) | Not Null |  |
| Address | STRING(30) |  |  |
| Email | STRING(30) | Unique |  |
| Phone | STRING(10) |  |  |
| Business | STRING(20) | Not Null | Business type of client like Manufacturer, Reseller, Consultant,  Professional etc. |

**Employees**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Attribute Type** | **Constraint** | **Remarks** |
| Empno | Integer | Primary Key |  |
| Ename | STRING(20) | Not Null |  |
| Job | STRING(15) |  |  |
| Salary | Decimal | Must be positive | Use CHECK constraint  to ensure salary is > 0 |
| Deptno | Integer | Foreign Key | Deptno as per  Departments table |

# Departments

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Attribute Type** | **Constraint** | **Remarks** |
| Deptno | Integer | Primary Key |  |
| Dname | STRING(15) | Not Null |  |
| Loc | STRING(20) |  |  |

**Projects**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Attribute Type** | **Constraint** | **Remarks** |
| Project\_ID | Integer | Primary Key |  |
| Descr | STRING(30) | Not Null | Description of project like ‘Accounting’ , ‘Inventory’, ‘Payroll’  etc. |
| Start\_Date | DATE |  | Start date of project |
| Planned\_End\_Date | DATE |  | Planned End date of  Project |
| Actual\_End\_date | DATE | Must be later than Planned\_End\_Date | Actual End date of project (Use CHECK  constraint) |
| Budget | Decimal | Must be positive | Use CHECK constraint  to ensure budget is > 0 |
| Client\_ID | INTEGER | Foreign Key | Client ID from Clients  Table |

# EmpProjectTasks

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Attribute Type** | **Constraint** | **Remarks** |
| Project\_ID | Integer | Primary Key, Foreign Key | Composite primary key and foreign keys referring Projects and  Employees table |
| Empno | INTEGER | Primary Key, Foreign Key |
| Start\_Date | DATE |  | Start date when employee begins task  on this project |
| End\_Date | DATE |  | End date when employee finishes task  on this project |
| Task | STRING(25) | Not Null | Task performed by employee like designing, coding,  review, testing etc. |
| Status | STRING(15) | Not Null | Status of task like ‘in progress’,  ‘complete’,’cancelled’ |

**Clients**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Client ID** | **Cname** | **AddresS** | **Email** | **Phone** | **Business** |
| 1001 | ACME Utilities | Noida | [contact@acmeutil.com](mailto:contact@acmeutil.com) | 9567880032 | Manufacturing |
| 1002 | Trackon Consultants | Mumbai | [consult@trackon.com](mailto:consult@trackon.com) | 8734210090 | Consultant |
| 1003 | MoneySaver  Distributors | Kolkata | [save@moneysaver.co](mailto:save@moneysaver.co)m | 7799886655 | Reseller |
| 1004 | Lawful Corp | Chennai | [justice@lawful.com](mailto:justice@lawful.com) | 9210342219 | Professional |

# Employees

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Empno** | **Ename** | **Job** | **Salary** | **Dept No** |
| 7001 | Sandeep | Analyst | 25000 | 10 |
| 7002 | Rajesh | Designer | 30000 | 10 |
| 7003 | Madhav | Developer | 40000 | 20 |
| 7004 | Manoj | Developer | 40000 | 20 |
| 7005 | Abhay | Designer | 35000 | 10 |
| 7006 | Uma | Tester | 30000 | 30 |
| 7007 | Gita | Tech.Writer | 30000 | 40 |
| 7008 | Priya | Tester | 35000 | 30 |
| 7009 | Nutan | Developer | 450  00 | 20 |
| 7010 | Smita | Analyst | 200  00 | 10 |
| 7011 | Anand | Project  Mgr | 650  00 | 10 |

**Departments**

|  |  |  |
| --- | --- | --- |
| **Deptno** | **Dname** | **Loc** |
| 10 | Design | Pune |
| 20 | Development | Pune |
| 30 | Testing | Mumbai |
| 40 | Document | Mumbai |

# Projects

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project\_ID** | **Descr** | **Start\_Date** | **Planned\_End\_Date** | **Actual\_End\_date** | **Budget** | **Client\_ID** |
| 401 | Inventory | 01-Apr-2011 | 01-Oct-2011 | 31-Oct-2011 | 150000 | 1001 |
| 402 | Accounting | 01-Aug-2011 | 01-Jan-2012 |  | 500000 | 1002 |
| 403 | Payroll | 01-Oct-2011 | 31-Dec-2011 |  | 75000 | 1003 |
| 404 | Contact Mgmt | 01-Nov-2011 | 31-Dec-2011 |  | 50000 | 1004 |

**EmpProjectTasks**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project\_ID** | **Empno** | **Start\_Date** | **End\_DaTe** | **Task** | **Status** |
| 401 | 7001 | 01-Apr-2011 | 20-Apr-2011 | System Analysis | Completed |
| 401 | 7002 | 21-Apr-2011 | 30-May-2011 | System Design | Completed |
| 401 | 7003 | 01-Jun-2011 | 15-Jul-2011 | Coding | Completed |
| 401 | 7004 | 18-Jul-2011 | 01-Sep-2011 | Coding | Completed |
| 401 | 7006 | 03-Sep-2011 | 15-Sep-2011 | Testing | Completed |
| 401 | 7009 | 18-Sep-2011 | 05-Oct-2011 | Code Change | Completed |
| 401 | 7008 | 06-Oct-2011 | 16-Oct-2011 | Testing | Completed |
| 401 | 7007 | 06-Oct-2011 | 22-Oct-2011 | Documentation | Completed |
| 401 | 7011 | 22-Oct-2011 | 31-Oct-2011 | Sign off | Completed |
| 402 | 7010 | 01-Aug-2011 | 20-Aug-2011 | System Analysis | Completed |
| 402 | 7002 | 22-Aug-2011 | 30-Sep-2011 | System Design | Completed |
| 402 | 7004 | 01-Oct-2011 |  | Coding | In Progress |

# SQL Assignment # 1 – Questions

1. Create the Clients table using the information provided above. Once tables are ready, fill in the given data of this table.
2. Create the Departments table using the information provided above. Once tables are ready, fill in the given data of this table.
3. Create the Employees table using the information provided above. Once tables are ready, fill in the given data of this table.
4. Create the Projects table using the information provided above. Once tables are ready, fill in the given data of this table.
5. Create the EmpProjectTasks table using the information provided above. Once tables are ready, fill in the given data of this table.
6. Display customer details with business as ‘Consultant’.
7. Display employee details who are not ‘Developers’.
8. Display project details with budget > 100000.
9. Display details of project that are already finished.
10. Display employee names beginning with ‘M’.
11. Display employee names ending with ‘a’.
12. Display the task that is ‘In Progress’.
13. Display employee name and salary in descending order of salary.
14. Display tasks in ascending order of end date.
15. Display distinct jobs from Employees table.
16. Display employee name, salary and bonus calculated as 25% of salary.
17. Display the employee name and their corresponding department name.
18. Find the total number of employees in each department.
19. Calculate the average salary of employees for each job title.
20. Find the total budget allocated for all projects combined.
21. Count how many projects have been completed for each client.
22. Find the maximum salary for employees in the Development department.
23. List all the projects along with the names of the clients using a join between Projects and Clients tables.
24. Show all the employees and their corresponding project descriptions where the project status is 'In Progress'.
25. List all the employees along with their department names and the projects they have been assigned to.
26. List the employees who worked on more than one project using a HAVING clause.