

Why are there blanks in rows 9 and 10?

How to produce an alphabetical listing of employees?

How to count how many employees are certified in Basic Database Manipulation?

Is Basic Database Manipulation the same as Basic DB Manipulation?

What if an employee acquires a fourth certification?

Do we add another column?

ID	ENum	Name	Title	HireDate	Skill1	Skill1Date	Skill2	Skill2Date	Skill3	Skill3Date
1	02345	Brian Oates	DBA	2/14/2001	Basic Database Management	2/14/2008	Advanced Database Management	2/14/2011	Basic Web Design	8/9/2009
2	08273	Marco Bienz	Analyst	7/28/2012	Basic Web Design	3/8/2015	Advance Process Modeling	8/19/2018		
3	06234	Jasmine Patel	Programmer	8/10/2011	Basic Web Design	8/10/2013	Advanced C# programming	8/10/2013	Basic DB manipulation	1/29/2018
4	03373	Franklin Johnson, Jr.	Purchasing Agent	3/15/2008	Advanced Spreadsheets	6/20/2017				
5	13567	Almond, Robert	Analyst	9/30/2018	Basic Process Modeling	9/30/2020	Basic Database Design	5/23/2021		
6	10282	Richardson, Amanda	Clerk	4/11/2017						
7	09382	Susan Mathis	Database Programmer	8/2/2016	Basic DB Design	8/2/2018	Basic Database Manipulation	8/2/2018	Advanced DB Manipulation	5/1/2019
8	14311	Duong, Lee	Programmer	9/1/2020	Basic Web Design	9/1/2022				
9					Master Database Programming					
10					Basic Spreadsheets					
11	09002	Wade Gaither	Clerk	5/20/2016	Advanced Spreadsheets	5/16/2019	Basic Web Design	5/16/2019		
12	13383	Raymond F. Matthews	Programmer	3/12/2018	Basic C# Programming	3/12/2020				
13	09283	Chavez, Juan	Clerk	7/4/2016						
14	04893	Patricia Richards	DBA	6/11/2010	Advanced Database Management	6/11/2012	Advanced Database Manipulation	9/20/2018		
15	13932	Lee, Megan	Programmer	9/29/2019						

Database name: Ch01_Text

Table name: CERTIFIED

Employee_ID	Skill_ID	Certified_Date
02345	100	2/14/2008
02345	110	8/9/2009
02345	180	2/14/2011
03373	120	6/20/2017
04893	180	6/11/2012
04893	220	9/20/2018
06234	110	8/10/2013
06234	200	8/10/2013
06234	210	1/29/2018
08273	110	3/8/2015
08273	190	8/19/2018
09002	110	5/16/2019
09002	120	5/16/2019
09382	140	8/2/2018
09382	210	8/2/2018
09382	220	5/1/2019
13383	170	3/12/2020
13567	130	9/30/2020
13567	140	5/23/2021
14311	110	9/1/2022

Table name: EMPLOYEE

Employee_ID	Employee_FName	Employee_LName	Employee_HireDate	Employee_Title
02345	Brian	Oates	2/14/2003	DBA
03373	Franklin	Johnson	3/15/2010	Purchasing Agent
04893	Patricia	Richards	6/11/2012	DBA
06234	Jasmine	Patel	8/10/2013	Programmer
08273	Marco	Bienz	7/28/2014	Analyst
09002	Wade	Gaither	5/20/2018	Clerk
09283	Juan	Chavez	7/4/2018	Clerk
09382	Susan	Mathis	8/2/2018	Database Programmer
10282	Amanda	Richardson	4/11/2019	Clerk
13383	Raymond	Matthews	3/12/2020	Programmer
13567	Robert	Almond	9/30/2020	Analyst
13932	Megan	Lee	9/29/2021	Programmer
14311	Lee	Duong	9/1/2022	Programmer

Table name: SKILL

Skill_ID	Skill_Name	Skill_Description
100	Basic Database Management	Create and manage database user accounts.
110	Basic Web Design	Create and maintain HTML and CSS documents.
120	Advanced Spreadsheets	Use of advanced functions, user-defined functions, and macroing.
130	Basic Process Modeling	Create core business process models using standard libraries.
140	Basic Database Design	Create simple data models.
150	Master Database Programming	Create integrated trigger and procedure packages for a distributed environment.
160	Basic Spreadsheets	Create single tab worksheets with basic formulas
170	Basic C# Programming	Create single-tier data aware modules.
180	Advanced Database Management	Manage Database Server Clusters.
190	Advance Process Modeling	Evaluate and Redesign cross-functional internal and external business processes.
200	Advanced C# Programming	Create multi-tier applications using multi-threading
210	Basic Database Manipulation	Create simple data retrieval and manipulation statements in SQL.
220	Advanced Database Manipulation	Use of advanced data manipulation methods for multi-table inserts, set operations, and correlated subqueries.

**” Why do we do it that way? Well, uhm,
we’ve always done it that way ... I guess.”**

“All undergraduate students will be assigned to one of the four communities upon initial registration: NORTH, EAST, SOUTH, and WEST.”

– Business rule @ Dartmouth

“All students are required to maintain a valid email address with the registrar after graduation.”

Since a DB cannot determine whether a provided email address is valid, an application will have to be written.

“Personal Health Information (PHI) of citizens of a member country of the EU may only reside on storage media that is physically within the boundaries of the EU as long as that citizen’s country is part of the EU.”

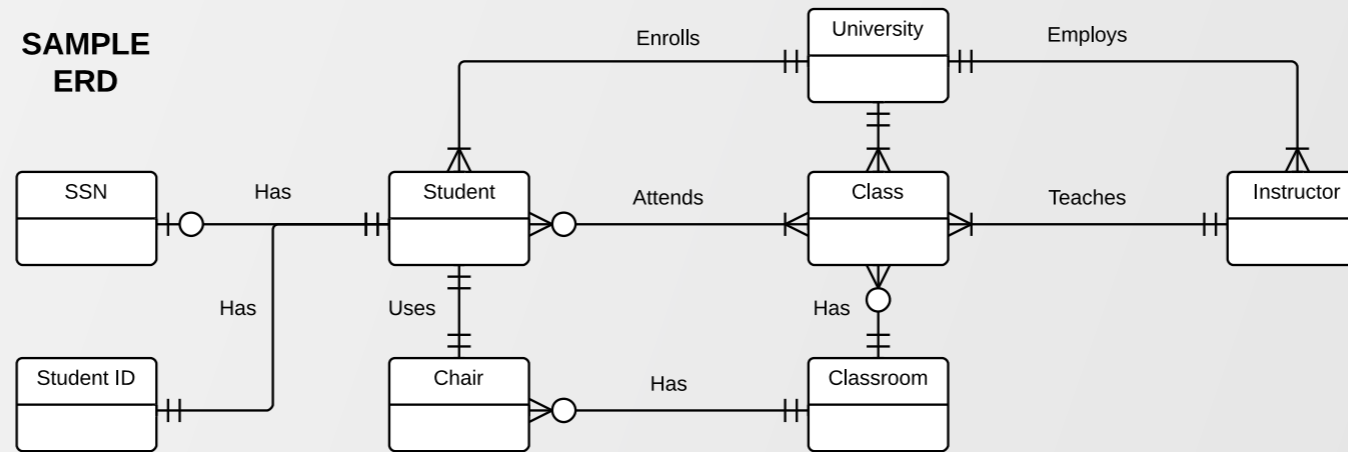
Since the DB cannot determine whether a country is a current member of the EU, some application code is needed.+

ERD "Crow's Foot" Relationship Symbols [Quick Reference]

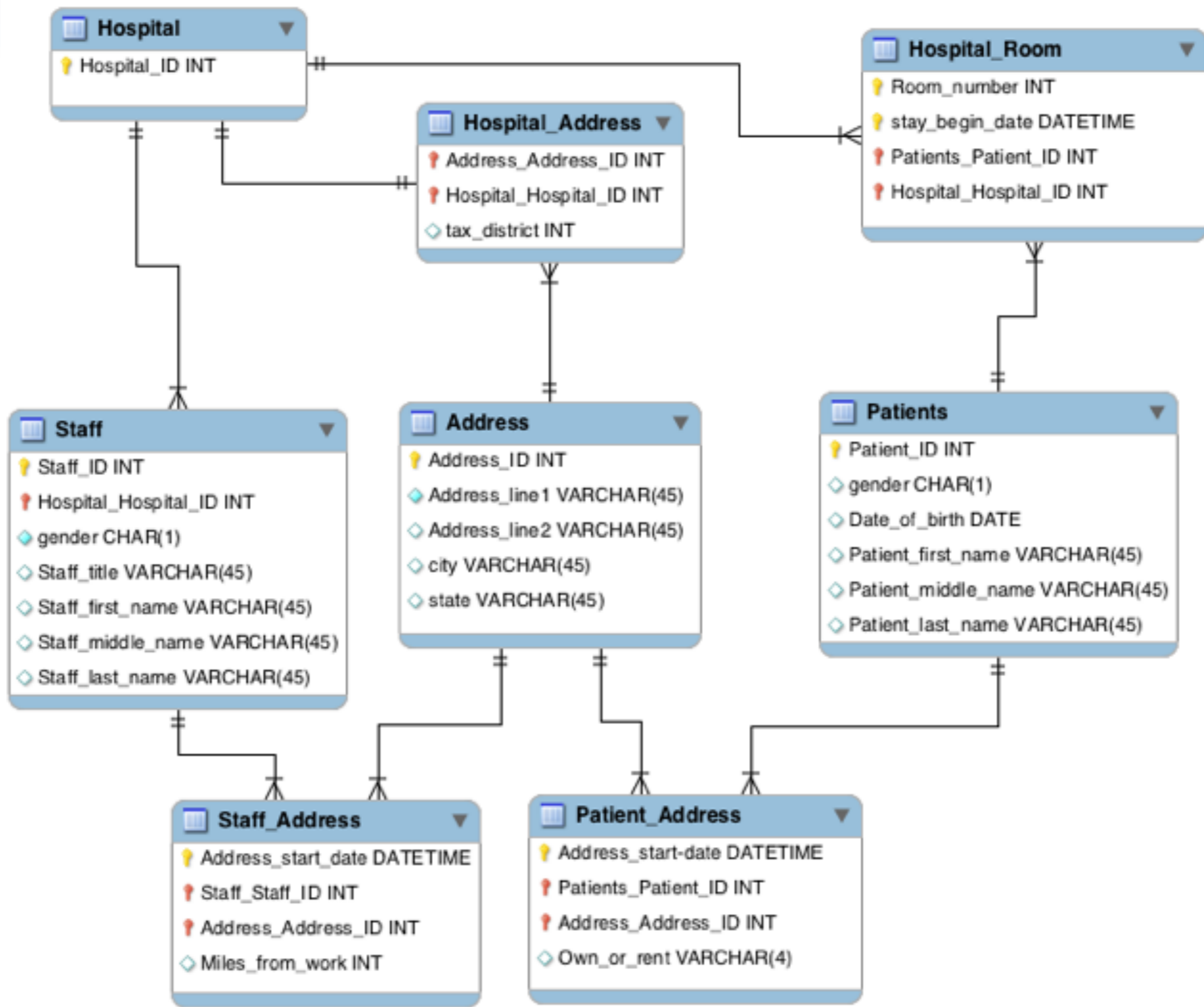
Created by Vivek M. Chawla | @VivekMChawla | April 7, 2013



SAMPLE ERD



Notation	Meaning	Example
—	Relationship	Student — Enrolls — University
—	One	Student — Has — Student ID Number
— >	Many	Student — > Attends — > Class
—	One and ONLY One	Student — Uses — Chair
—○	Zero or One	Student — Has —○ Social Security Number
— >	One or Many	Instructor — Teaches — > Class
—○>	Zero or Many	Classroom — Has —○> Chair



Business rules example: Registrar

- A Student must register for the courses he/she wishes to take in a term. He/she can take up to six courses per term.
- A class has a professor, who might teach one or more courses each term. The same, or a different, professor will teach each class, but no professor will be required to teach more than three courses in a term.
- For courses with large enrollments, multiple sections may be created and registered students will be placed in one of them up to a maximum of 35 in each class.
- The classes are always indoors, in an assigned room. It is not required that all classes for a course be taught in the same room. Not all courses are taught each term.