

Code to store AND, OR relation, association

Many thanks for your help on this.

In order for an enterprise to get a call for tender it must meet certain requirements.

For the first example the enterprise must have a minimal class 4, and have qualification 2 in sector 5.

Minimal class is always one number.

Qualifications can be anything (single, or multiple using AND, OR logical operators)

I have created tables in order to map each number to it's given name. Now I need to store requirements in the database.

- **minimal class 4**
 - **Sector Qualification 5.2**
-
- **minimal class 2**
 - **Sector Qualifications 3.9 and 4.10**
-
- **minimal class 3**
 - **Sector Qualifications 6.1 or 6.3**
-
- **minimal class 1**
 - **Sector Qualifications (3.1 and 3.2) or (5.6 and 7.1)**

```
class Notice < ActiveRecord::Base
  has_many :requirements
end

class Requirement < ActiveRecord::Base
  belongs_to :notice
end

class Domain < ActiveRecord::Base
  has_many :domain_sectors
  has_many :sector_qualifications, :through => :domain_sectors
end

class DomainSector < ActiveRecord::Base
  belongs_to :domain
  has_many :sector_qualifications
end

class SectorQualification < ActiveRecord::Base
  belongs_to :domain_sector
end

create_table "notices", :force => true do |t|
  t.string "body"
end

create_table "requirements", :force => true do |t|
  t.integer "minimal_class_number"
  t.integer "sector_number"
  t.integer "qualification_number"
  t.integer "set_number"
```

```

t.integer "weight"
t.integer "notice_id"
end


create_table "domains", :force => true do |t|
  t.string "name"
end


create_table "domain_sectors", :force => true do |t|
  t.string "name"
  t.integer "number"
  t.integer "domain_id"
end

create_table "sector_qualifications", :force => true do |t|
  t.string "name"
  t.integer "number"
  t.integer "domain_sector_id"
end

```

[ruby-on-rails](#)

edited **2 mins ago**
 PerformanceDBA
2,083 1 1 12

asked **Dec 9 '10 at 20:38**
 user455387
8 3

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3 Answers

If you follow the 'test-driven' approach, you should start with some tests and write code to make them pass. So your most basic example, could start out as the following in RSpec. From what you've said you have a 'tender' and an 'enterprise' - I'd start there.

```

describe 'inviting an enterprise to tender' do

  describe 'for a tender that has a minimum class' do

    before do
      @tender = Tender.create(:minimum_class_level=>4)
    end


    it 'should invite the enterprise to tender if the enterprise has clas
      enterprise = Enterprise.create(:class_level=>4)
      enterprise.should be_invited_to_tender(@tender)
    end

    it 'should not invite the enterprise to tender if the enterprise has
      enterprise = Enterprise.create(:class_level=>3)
      enterprise.should_not be_invited_to_tender(@tender)
    end
  end
end

```



Write some code to make that pass, and once that's green, move on to adding further models as and when required. Your data model will emerge, as will your code 'documentation' in the form of a test suite.

answered **2 days ago**
 stef
621 6
[add comment](#)

The problem you are experiencing is, trying to force-fit your OO classes into a Relational database.

If you want the power and flexibility of a Relational databases; if you wish to avoid "re-factoring" the data every time you "re-factor" your classes, do not do that.

Forget about your classes, and model the data as data. It will not be "complex" or "tricky". When you are finished, map your classes to the data.

If you want more information on the absurdity of implementing OO classes in the database, read [this answer](#) starting from the **11 Dec 10** entry.

Now if you tell us what your data is, and how it is related to each other, we can model that for you.

Responses to Comments 27 Dec 10

Sure thing. Forget the tables and classes for now, just think about the data, in terms of Entities or Things, Nouns, that may relate to each other. Do not worry about the AND/OR, that is easy once the data is modelled correctly (and impossible if not !).

- 1) Does the Class identify the Qualification; Sector ? And that is independent of Enterprise ? (I think so, so I have modelled that.)
- 2) Do you have names instead of numbers for MinimumClass/Sector/Qualification ? (Please stop sticking Id columns on everything that moves: it seriously hinders the modelling process; understanding the data.) I need examples of real data: Sector; Qualification; Class.
- 3) Does each of Class, Sector, Qualification exist on its own; eg. Qualification exists only in the context of Sector ?

Have a look at this initial [ER Diagram](#) (we are not ready for the Data Model.) (inline links do not work on some browsers/versions.)

- You have a good idea of what you want; I am asking you to set that aside and think about just the data and how it relates to other data
- I suspect the model on the left is what you have been staring at; it is familiar; but there is too much going on in one place. It is definitely not Normalised, and that is what we have to fix first.
- I think you cannot have a Qualification without a Sector. Right ?
- next, a Qualification exists independent of Class
- next, a Class has a set of Requirements, which consists of Qualifications. Right ?
- then we can think about what a Class is; what those Requirements are; the ANDs and ORs.

1) The link provides Sector-Qualification numbers, sure, but that looks more like chapter-section numbers that will change next year. I accept that people do talk about a "Classe Une qualification"; but I doubt the people actually discuss a "1.3 qualification". I have modelled it based on what you stated, but if the Sector/Qualification numbers are not stable, you are better off either using increment of 10; or some other number or code that means something to you and not the outside world, The Name is the meaning that will not change.

2) AND/OR. I have used two methods in the past that are useful here. One was based on a series of BIT or BOOLEAN Indicators, such as `IsOne` and `IsOneOfTwo`; that was more useful for the coding involved; and there were `IsMandatory` requirements involved.

For you, a simpler method using a `Weight` column is all you need. The total `Weight` of *any qualifying set* for a `Class`, in the same `Sector` * (not the total `Weight` for a `Class`, they may be several *sets*) equals 1.0. If the `Weight` of a row for a `Class`, in the same `Sector`, is less than 1, you need to keep ANDing it with other rows, to make a full `Class`. This will allow you to have threes in future. I have provided the full set of rows for the examples you used. Ask specific questions if any of that is not completely understood.

Data Model

Evaluate this initial [Data Model](#) (inline links do not work on some browsers/versions.)

Readers who are not familiar with the Relational Modelling Standard may find the [IDEF1X Notation](#) useful.

Response to Comments 01 Jan 11

3) *If I have (3.1 and 3.2) or (5.6 and 5.9) if I use 0.5, how can I differentiate this with (3.1 and 3.2 and 5.6 and 5.9), I must use a different weight for each groupe that's right ? 0.5 for the (3.1 and 3.2), and 0.6 for (5.6 and 5.9) ?*

No. You've added a bit to the question (no problem; modelling is a back-and-forth exercise). Never play with trying to identify control in the data. The control lies in the Keys, the Identifiers. That differentiation is already provided in the Mmodel. The changed requirement (question, not table) is now:

- For a `Class` to `Qualify`, the weight of the `Requirement` must be at least 1.0 *in the same Sector*

(5.6 and 5.9) remain at 0.5 each; they are a different `Sector` (5) to (3.1 and 3.2) which are (3).

4) Have you read and understood the **IDEF1X Notation**, and do you appreciate the compound keys in

the model? Requirement PK is (ClassNo, SectorNo, QualificationNo); the only data is Weight.

5) Are you clear about the Business Rules that the Model supports? Would you like me to list them?

Responses to Comments 02 Jan 11

Some precisions, (1) Class is completely different from Sector/Qualification, they are not connected directly.

Yes, it already is independent. Class is as per all statements above, plus Sector and Qualification being correct: "SECTORS; ACTIVITY OF QUALIFICATION AND **CLASSIFICATION** OF THE COMPANIES ENGAGING IN THE BUILDING SECTOR". We have to take one step back, and confirm the simple rules before moving forward. New Data Model. Please confirm/deny each of these statements, working side-by-side with the DM:

- A Sector is made up of 1-to-many Qualifications (the link provided)
- A Qualification is a requirement in 1-to-many Classifications
- A Classification requires 1-to-many Qualifications:
 - a **set** of Qualifications is required to make a Qualification
 - Some Qualifications are OR-ed
 - Some Qualifications are AND-ed
 - the **set** of Qualifications required for a Classification, that are OR-ed or AND-ed, must be in the same Sector
- (New info) A Classification Notice is issued to 1-to-many Enterprises.
- An Enterprise is endorsed with 1-to-many Classifications.

(2) You assume that the two operands have the same Sector, it can be (3.1 and 4.6) or (5.6 and 1.9).

(I am assuming nothing, I am distilling the info provided by you: give me more info, and I will give you a more precise model);-}

No problem. (2.a) Identify the **basis** for (3.1 and 4.6) being grouped. (2.b) Identify the *name* of each Classification (3.1 and 4.6), (5.6 and 1.9); what makes them different/distinct from the group (3.1 and 3.2)

(4) for the ERD and dm we just need to change Enterprise to Notice and connect it to Requirement.

Don't worry about the "connections", that is the job I have accepted, at your request. ;-}

(5) each Notice has many Requirements that each enterprise must meet to be allowed to participate.

(5.a) What is the content of these Notices; is it not an endorsement that they have achieved a Classification? Or that they have achieved a single Requirement?

(5.b) Does the system have to track each requirement that each Enterprise meets?

(5.c) Separate to requirements, when an Enterprise achieves a Classification (set of Requirements) does the system issue a Notice of Classification?

Update

Based on the new information, I can see where you are heading. Please evaluate this [►Very Tentative Data Model◀](#).

- ~~The OR-ing and AND-ing is even simpler~~
- ~~Each Classification has a set of possible Requirements (OR-ed)~~
- ~~Each ClassificationSet is required in full (AND-ed)~~
- ~~Weight is no longer required~~
- ~~This tracks each Qualification awarded to an Enterprise (user inserts this); and updates IsNotified when the Notice is issued~~
- ~~and each Classification achieved~~

~~Perhaps daily, a procedure is required to process the EnterpriseQualifications (compare against a ClassificationSet) and produce (insert) EnterpriseClassifications. And again update IsNotified when the Notice is issued.~~

Ok, I have removed the bits you don't need, as per comments, and updated the Tentative Data Model.

Awaiting response re the remaining questions. So not it is an [►Incomplete Data Model◀](#).

In order to "connect" Notice to Requirements, I need to know the **basis** of the relation; it cannot be one

Notice to many, any Requirement.

Simplicity. Actually, I am a master of simplicity. K.I.S.S. isn't a shallow mantra, there is actually a science to it. In order to eliminate problems during development and coding, you need a clean data model; simple, uncomplicated. That's what I am trying to give you. But I need information.

Please provide feedback.

edited [yesterday](#)

answered **Dec 25 '10 at 23:22**



[PerformanceDBA](#)
2,083 1 1 12

How can i model this plz – [user455387](#) Dec 26 '10 at 6:14

@[user455387](#). Answered in my post. There is still a bit of back-and-forth to go through.
– [PerformanceDBA](#) Dec 26 '10 at 15:19

Class doesn't have a name, it's just a number, it is peer Domain, and independent of Enterprise, Sector, and Qualification. MinimumClass and Class are the same. Sector/Qualification each have a specific number and a name. i have provided three real examples, generally only numbers are provided but sometimes the names too. here is the data for "Batiment" domain,
www.mhu.gov.ma/NR/rdonlyres/0F2ED714-2DBA-4090-BFD2-2ABEE2F330C0/0/listsecteurqualif.pdf
– [user455387](#) Dec 27 '10 at 9:01

@[user455387](#). Answered in my post. Now I need feedback or the ERD as well as the DM.
– [PerformanceDBA](#) Dec 27 '10 at 12:49

Thank you very much, if I have (3.1 and 3.2) or (5.6 and 5.9) if I use 0.5, how can I differentiate this with (3.1 and 3.2 and 5.6 and 5.9), I must use a different weight for each groupe that's right ? 0.5 for the (3.1 and 3.2), and 0.6 for (5.6 and 5.9) ? – [user455387](#) 2 days ago

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What you're building sounds terribly complex. But if you want to continue, you might want to look at `has_many :something, :through => :something_else` :
http://api.rubyonrails.org/classes/ActiveRecord/Associations/ClassMethods.html#method-i-has_many

answered **Dec 9 '10 at 21:19**



[iain](#)
1,975 1 9

It's not complex; it is unidentified. – [PerformanceDBA](#) 21 secs ago [edit](#)

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