Model for Student Table

SELECT * FROM students;

<table>
<thead>
<tr>
<th>id</th>
<th>name</th>
<th>birth</th>
<th>gpa</th>
<th>grad</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anderson</td>
<td>1987-10-22</td>
<td>3.9</td>
<td>2009</td>
</tr>
<tr>
<td>2</td>
<td>Jones</td>
<td>1990-04-16</td>
<td>2.4</td>
<td>2012</td>
</tr>
<tr>
<td>3</td>
<td>Hernandez</td>
<td>1989-08-12</td>
<td>3.1</td>
<td>2011</td>
</tr>
<tr>
<td>4</td>
<td>Chen</td>
<td>1990-02-04</td>
<td>3.2</td>
<td>2011</td>
</tr>
</tbody>
</table>

Rails model class (app/models/student.rb):

class Student < ActiveRecord::Base
End

Command to create this class:

rails generate model student
Create New Record

```ruby
student = Student.new
student.name = "Williams"
student.birth = "1989-11-16"
student.gpa = 2.8
student.grad = 2012
student.save()
```
Read, Update, Delete

```ruby
student = Student.find(187)
student = Student.find_by_name("Hernandez")
smarties = Student.find(:all, 
  :conditions => "gpa >= 3.0")
smarties = Student.find(:all, :limit => 10, 
  :order => "gpa DESC")

student = Student.find(187)
student.gpa = 4.0
student.save()

Student.find(187).destroy()
```
Many-to-One Relationships

```ruby
SELECT * FROM students;
+-----------------+-----------------+-----------------+-----------------+
| id  | name           | birth           | gpa  | grad | advisor_id |
+-----------------+-----------------+-----------------+-----------------+
|  1   | Anderson        | 1987-10-22      | 3.9  | 2009 | 2          |
|  2   | Jones           | 1990-04-16      | 2.4  | 2012 | 1          |
|  3   | Hernandez       | 1989-08-12      | 3.1  | 2011 | 1          |
|  4   | Chen            | 1990-02-04      | 3.2  | 2011 | 1          |
+-----------------+-----------------+-----------------+-----------------+

SELECT * FROM advisors;
+-------------------+-----------------+-----------------+
| id    | name       | title         |
+-------------------+-----------------+-----------------+
|  1    | Fujimura   | assocprof     |
|  2    | Bolosky    | prof          |
+-------------------+-----------------+-----------------+
```

```ruby
class Student < ActiveRecord::Base
  belongs_to :advisor
end
class Advisor < ActiveRecord::Base
  has_many :students
end
```
Many-To-One Examples

```
advisor = Advisor.find_by_name("Fujimura")
for student in advisor.students do
    ...
end

student = Student.find_by_name("Chen")
student.advisor = Advisor.find_by_name("Bolosky")
student.save
```
Many-to-Many Relationships

```ruby
class Student < ActiveRecord::Base
  has_and_belongs_to_many :courses
end

class Course < ActiveRecord::Base
  has_and_belongs_to_many :students
end
```

```ruby
SELECT * FROM students;
+-----------------------------+-----------+-----------+-----------+-----------+
| id | name      | birth     | gpa       | grad     |
+-----------------------------+-----------+-----------+-----------+-----------+
| 1  | Anderson  | 1987-10-22| 3.9       | 2009     |
| 2  | Jones     | 1990-04-16| 2.4       | 2012     |
| 3  | Hernandez | 1989-08-12| 3.1       | 2011     |
| 4  | Chen      | 1990-02-04| 3.2       | 2011     |
+-----------------------------+-----------+-----------+-----------+-----------+

SELECT * FROM courses_students;
+-----------------------------+-----------+
| course_id | student_id |
+-----------------------------+-----------+
| 1          | 1          |
| 3          | 1          |
| 4          | 1          |
| 1          | 2          |
| 2          | 2          |
| 1          | 3          |
| 2          | 4          |
| 4          | 4          |
+-----------------------------+-----------+

SELECT * FROM courses;
+-----------------------------+-----------------------------+
| id | number | name            | quarter       |
+-----------------------------+-----------------------------+
| 1  | CS142  | Web stuff       | Winter 2009   |
| 2  | ART101 | Finger painting | Fall 2008     |
| 3  | ART101 | Finger painting | Winter 2009   |
| 4  | PE204  | Mud wrestling   | Winter 2009   |
+-----------------------------+-----------------------------+
Many-To-Many Examples

student = Student.find_by_name("Anderson")
cs142 = Course.find_by_number("CS142")
student.courses << cs142
Migration: Create New Table

db/migrate/20090215220309_create_students.rb:

class CreateStudents < ActiveRecord::Migration
  def up
    create_table :students do |t|
      t.column :name, :string
      t.column :birth, :date
      t.column :gpa, :float
      t.column :grad, :integer
    end
  end

  def down
    drop_table :students
  end
end
Migration: Add Column

```
db/migrate/20101013224357_add_advisor.rb:

class AddAdvisor < ActiveRecord::Migration
  def up
    add_column :students, :advisor_id, :integer
  end

  def down
    remove_column :students, :advisor_id
  end
end
```
Migration Utilities

rails generate migration create_students

rails generate model students

rake db:migrate

rake db:migrate VERSION=20090130180755

rake db:migrate VERSION=0

rake db:migrate:reset