Use of Github and pushing the initial application

I generated the Rails application using

```
rails new quiz
```

And a basic controller for a placeholder welcome page:

```
cd rails
bin/rails generate controller welcome index
```

I created a git repository on my Github account to store the project: https://github.com/sandeel/humble-quiz-app

I then initialised a git repository

```
git init
```

And added the remote origin

```
git remote add origin git@github.com:sandeel/humble-quiz-app.git
```

I then pushed my initial project to github

```
git add -A
git commit -m "Initial commit"
git push -u origin master
```

Database architecture: Models and Migrations

Ruby's `rake` command was used to generate the models for the application.

Examples:

```
bin/rails generate model Quiz title:string
```

to create a model for a quiz. It consists of only a title because the rest of a quiz is composed of other entities, eg. Question, Attempt.

```
bin/rails generate model Question text:string quiz:references
```

for creating a Question which represents a quiz question with text for the question text.

```
bin/rails generate model Attempt quiz:references result:integer
```

for creating a model for Attempt which represents an attempt at a quiz. The model contains a foreign key to the quiz the attempt is on and an integer representing the score the user got on the quiz.

Migrations were used to modify existing models as so:

```
bin/rails g migration AddCorrectAnswerToQuestions correct_answer:int
```

This modified the Question model to add an extra field for the correct answer to the question.

```
  bin/rails g migration AddDifficultyToQuizzes difficulty:int
```

This added a difficulty variable to the quiz model.

```
bin/rake db:migrate
```

Custom gems

I created two custom gems for use in my application.

The gems were created by writing a `gemspec` file and running `gem build`. This created a gem which I installed on my local machine using `gem install`. To use the gem in my Rails application, I included the lines `gem 'quiz-score-calculator'` and `gem 'next-quiz-generator'` in my Rails Gemfile.

NextQuizGenerator

This gem contains the algorithm for generating the next set of questions for the user, based on their level of learning so far.

Here is how the algorithm works in the gem:

```
def self.getNextQuiz(users_previous_attempts, available_quizzes)

   ## if the user hasn't done more than three quizzes just give them
   ## the first three quizzes in order to get an idea of their level

   if users_previous_attempts.count <= 3
     return available_quizzes.find(users_previous_attempts.count)
   end


   ## after the user has done more than three quizzes
   ## get an average of their scores so far

   scores_so_far = []
   for attempt in users_previous_attempts
       if attempt.result
           scores_so_far.push(attempt.result)
       end
   end

   average_score_based_on_attempts =  (scores_so_far.sum / scores_so_far.size.to_f)


   ## sort the quizzes in descending orfer of difficulty and
   ## iterate through them until we find one matching the user's level

   for quiz in available_quizzes.order('difficulty DESC')
       if quiz.difficulty < average_score_based_on_attempts
           return quiz
       end
   end


   ## if all else fails just return the first quiz

   return available_quizzes.find(1)
 end
end
```

QuizScoreCalculator

The calculation of the percentage result on a quiz is contained in a separate gem called QuizScoreCalculator.

The gem contains a class called QuizScoreCalculator with a method which takes two parameters: a set of questions and a set of answers. It calculates the percentage of correct answers given.

Example use of the gem in the main application:

```
require 'quiz-score-calculator'

QuizScoreCalculator.getResult(the_questions, the_answers_given)
```

External Gems

Gaffe

Gaffe was used to generate custom error pages for Rails. More details on this below.

Custom error handling pages

Gaffe was installed on my machine using

```
sudo gem install gaffe
```

Gaffe was then added to the project by adding the following line to the Gemfile:

```
gem 'gaffe'
```

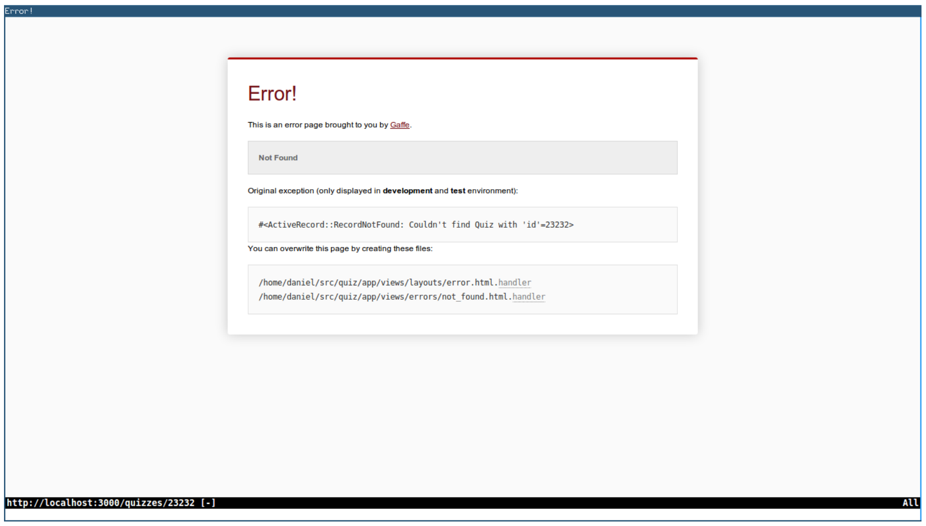
Gaffe was then added to initializers by creating a file called gaffe.rb in config/initializers with the following content:

```
Gaffe.enable!
```

To allow me to test the error pages in development mode I had to edit `config/environments/test.rb` and change the option `config.consider_all_requests_local` to `true`.

The following is an example of an error page generated by Gaffe. To get an error page, simple try to navigate to a quiz with an id which doesn't exist (see figure 1.)

Deployment to Heroku



Error!

Error!

This is an error page brought to you by Gaffe.

Not Found

Original exception (only displayed in **development** and **test** environment):

```
#<ActiveRecord::RecordNotFound: Couldn't find Quiz with 'id'=23232>
```

You can overwrite this page by creating these files:

```
/home/daniel/src/quiz/app/views/layouts/error.html.handler
/home/daniel/src/quiz/app/views/errors/not_found.html.handler
```

```
http://localhost:3000/quizzes/23232 [-]                                    All
```

Figure 1: Sample custom error page