College of Engineering, Construction and Living Sciences
Bachelor of Information Technology
IN608: Intermediate Application Development Concepts
Level 6, Credits 15

Practical 08 Django 2: View & Template

Due Date: 24/08/2020 at 5pm

In this practical, you will complete a series of tasks covering today's lecture. This practical is worth 1% of the final mark for the IN608: Intermediate Application Development Concepts course.

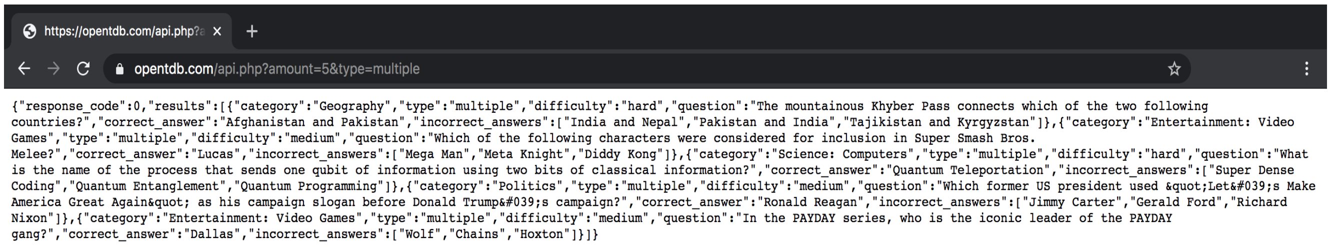
Before you start, in your practicals repository, create a new branch called **08-practical**.

Task 1

Create a Django project called `quiz`. `cd` to `quiz`, create a virtual environment & install Django. Create an app called `practical08quiz`. Please ensure you configure your app in `quiz/settings.py` & `quiz/urls.py`. `cd` to the `practical08quiz` directory & create a Python file called `urls.py`. In `urls.py`, set the `app_name` to `practical08quiz` & create a URL which maps to the `index` function in `views.py`. In the `practical08quiz` directory, create a directory called `templates` & sub-directory called `practical08quiz`. In `templates/practical08quiz`, create an `HTML` file called `index.html`.

In `views.py`, create a function called `index`. In this function, you will make a `GET` request to the `OpenTDB API` using the `Requests` Python module. **Note:** You will need to install `Requests` Python module in your virtual environment. Please ensure correct error checking, for example, not being able to make a `GET` request to the `OpenTDB API`. In this instance, you would raise a `ConnectionError` using the `Requests Exceptions` interface. Create a dictionary called `context`. This will be a dictionary of values (either the response contents from the `GET` request or an error message) to add to the template context.

The response contents should be in a `JSON (JavaScript Object Notation)` format. For example, if I make a `GET` request to https://opentdb.com/api.php?amount=5&type=multiple, the response contents would look like the following:



```
{"response_code":0,"results":[{"category":"Geography","type":"multiple","difficulty":"hard","question":"The mountainous Khyber Pass connects which of the two following
countries?","correct_answer":"Afghanistan and Pakistan","incorrect_answers":["India and Nepal","Pakistan and India","Tajikistan and Kyrgyzstan"]},{"category":"Entertainment: Video
Games","type":"multiple","difficulty":"medium","question":"Which of the following characters were considered for inclusion in Super Smash Bros.
Melee?","correct_answer":"Lucas","incorrect_answers":["Mega Man","Meta Knight","Diddy Kong"]},{"category":"Science: Computers","type":"multiple","difficulty":"hard","question":"What
is the name of the process that sends one qubit of information using two bits of classical information?","correct_answer":"Quantum Teleportation","incorrect_answers":["Super Dense
Coding","Quantum Entanglement","Quantum Programming"]},{"category":"Politics","type":"multiple","difficulty":"medium","question":"Which former US president used &quot;Let&#039;s Make
America Great Again&quot; as his campaign slogan before Donald Trump&#039;s campaign?","correct_answer":"Ronald Reagan","incorrect_answers":["Jimmy Carter","Gerald Ford","Richard
Nixon"]},{"category":"Entertainment: Video Games","type":"multiple","difficulty":"medium","question":"In the PAYDAY series, who is the iconic leader of the PAYDAY
gang?","correct_answer":"Dallas","incorrect_answers":["Wolf","Chains","Hoxton"]}]}
```

Note: If the page is reloaded, the response contents will be different.

Pay careful attention to the `response_code` key in the response content. This is appended to each API call to help tell developers what the API is doing. Below is a description of each `response_code`:

- `response_code: 0` or `Success` - returned results successfully.
- `response_code: 1` or `No results` - could not return results. The API does not have enough questions for your query.
- `response_code: 2` or `Invalid parameter` - contains an invalid parameter. Parameters passed in are not valid, i.e, https://opentdb.com/api.php?amount=five
- `response_code: 3` or `Token not found` - session token does not exist.
- `response_code: 4` or `Token empty` - session token has returned all possible questions for the specified query. Resetting the token is necessary.

Please ensure you check for all response codes. If `response_code` is 1-4, add an error message to the `context` dictionary.

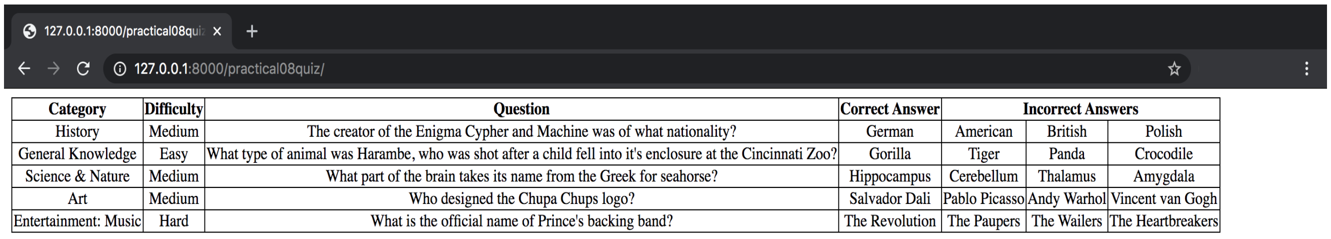
In `index.html`, display `context` in a nicely formatted `HTML` table. Use the `capfirst` filter to capitalise the first letter of each `difficulty` value. You may notice that some questions & answers contain character entities, i.e., `&quot;`. Use the `safe` filter to mark a value as not requiring further `HTML` escaping before outputting. For example, the `question` value `Who is the founder of &quot;The Lego Group&quot;?` would be marked as not requiring further `HTML` escaping. Instead, the output would be `Who is the founder of "The Lego Group"?` & not contain `quot;` or other character entities.

Next week, we will look at how to serve static files, i.e., `CSS`, `JavaScript`, images, etc. Until then, internal styling will be accepted.

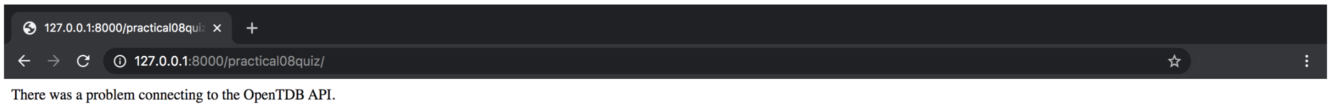
Expected Output

Run the command `python manage.py runserver` then navigate to http://127.0.0.1:8000/practical08quiz/

Note: The incorrect answers column span is 3.



Category	Difficulty	Question	Correct Answer	Incorrect Answers		
History	Medium	The creator of the Enigma Cypher and Machine was of what nationality?	German	American	British	Polish
General Knowledge	Easy	What type of animal was Harambe, who was shot after a child fell into it's enclosure at the Cincinnati Zoo?	Gorilla	Tiger	Panda	Crocodile
Science & Nature	Medium	What part of the brain takes its name from the Greek for seahorse?	Hippocampus	Cerebellum	Thalamus	Amygdala
Art	Medium	Who designed the Chupa Chups logo?	Salvador Dali	Pablo Picasso	Andy Warhol	Vincent van Gogh
Entertainment: Music	Hard	What is the official name of Prince's backing band?	The Revolution	The Paupers	The Wailers	The Heartbreakers


127.0.0.1:8000/practical08quiz
127.0.0.1:8000/practical08quiz/

There was a problem connecting to the OpenTDB API.

Deployment link: https://int-app-dev-practical-08.herokuapp.com/practical08quiz/

Resources

- OpenTDB API
- Requests
- Requests JSON Response Content
- Requests Exceptions
- Django Built-In Filters

Task 2

Create a Django project called `dog`. `cd` to `dog`, create a virtual environment & install Django. Create an app called `practical08dog`. Alternatively, you can create an app in `quiz`. Though, it requires additional configuration. Please ensure you configure your app in `dog/settings.py` & `dog/urls.py`. `cd` to the `practical08dog` directory & create a Python file called `urls.py`. In the `practical08dog` directory, create a directory called `templates` & sub-directory called `practical08dog`. In `templates/practical08dog`, create a two `HTML` files called `index.html` & `details.html`.

In `models.py`, create a class called `Dog` which extends `models.Model`. In `Dog`, declare the following:

```
RANGE_CHOICE = [('L', 'Low'), ('M', 'Medium'), ('H', 'High')]
```

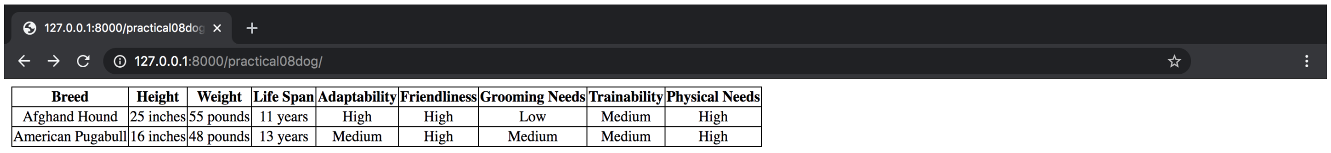
Above is a list containing tuples used as choices for a field. The first element in each tuple is the actual value to be set on the model & the second element is the human-readable name. If choices are given to a field, they are enforced by model validation. The default form widget will be a select drop down containing choices as drop down options.

Below `RANGE_CHOICE`, declare the following field names with their types & options:

```
breed = models.CharField(max_length=200, unique=True)
height = models.IntegerField(default=1)
weight = models.IntegerField(default=1)
life_span = models.IntegerField(default=1)
adaptability = models.CharField(choices=RANGE_CHOICE, max_length=200)
friendliness = models.CharField(choices=RANGE_CHOICE, max_length=200)
grooming_needs = models.CharField(choices=RANGE_CHOICE, max_length=200)
trainability = models.CharField(choices=RANGE_CHOICE, max_length=200)
physical_needs = models.CharField(choices=RANGE_CHOICE, max_length=200)
```

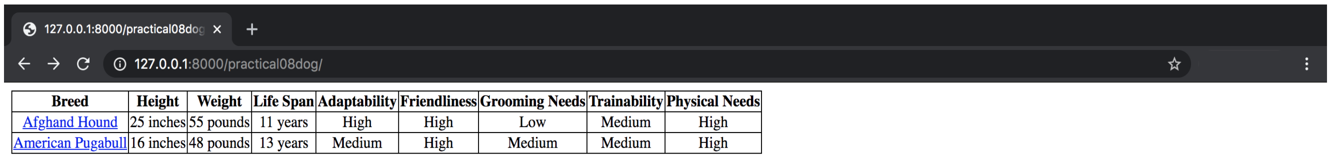
For `Dog`, create a `__str__` method which returns `breed`.

In `views.py`, create two functions called `index` & `details`. In the `index` function, render the `index.html` template with a `context` dictionary containing all `Dog` objects in the database. In `index.html`, display `context` in a nicely formatted HTML table. For `height`, `weight` & `life_span`, use the `pluralize` filter which returns a plural suffix if a value is not 1, '1' or an object of length 1. By default, this suffix is 's'. `height` will require an alternative suffix, i.e., 'es'.



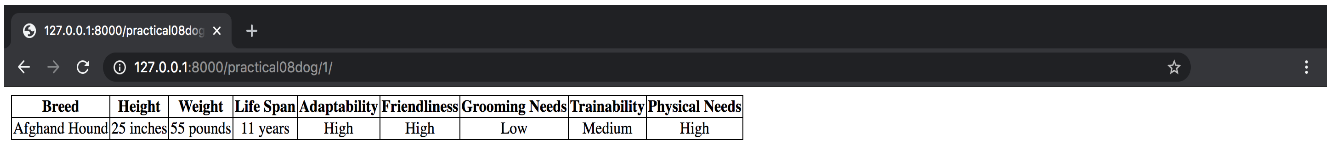
Breed	Height	Weight	Life Span	Adaptability	Friendliness	Grooming Needs	Trainability	Physical Needs
Afghand Hound	25 inches	55 pounds	11 years	High	High	Low	Medium	High
American Pugabull	16 inches	48 pounds	13 years	Medium	High	Medium	Medium	High

In `index.html`, change each `breed` value to a link so when clicked, gets the `Dog` object by its id & displays its details.



Breed	Height	Weight	Life Span	Adaptability	Friendliness	Grooming Needs	Trainability	Physical Needs
Afghand Hound	25 inches	55 pounds	11 years	High	High	Low	Medium	High
American Pugabull	16 inches	48 pounds	13 years	Medium	High	Medium	Medium	High

In the `details` function, render the `details.html` template with a `context` dictionary containing the `Dog` object with the primary key of, for example, 1 from `Dog`. Again, in `details.html`, display `context` in a nicely formatted `HTML` table & use the `pluralize` filter for `height`, `weight` & `life_span`.


127.0.0.1:8000/practical08dog
127.0.0.1:8000/practical08dog/1/

Breed	Height	Weight	Life Span	Adaptability	Friendliness	Grooming Needs	Trainability	Physical Needs
Afghand Hound	25 inches	55 pounds	11 years	High	High	Low	Medium	High

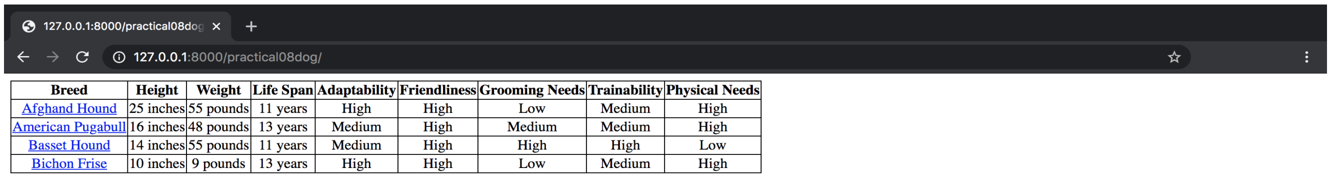
In `urls.py`, set the `app_name` to `practical08dog` & create two URLs which map to the `index` & `details` functions in `views.py`.

Fixtures

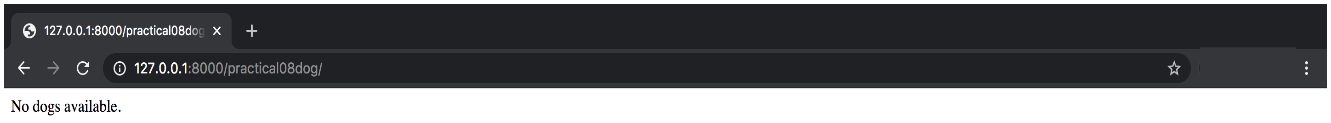
In Django, you can pre-populate your database using migrations or fixtures. If you want to automatically load initial data, create a migration by running the command `python manage.py migrate`. Fixtures work slightly different as data is not automatically loaded like migrations. A fixture is a collection of data that Django knows how to import into a database. Fixtures can be written as `JSON`, `XML (Extensible Markup Language)` or `YAML (Yet Another Markup Language)`. Feel free to use any of the three formats. To start using fixtures, create a directory called `fixtures`. A `JSON` file called `dogs.json` has been provided for you in the `08-django-2-view-template` directory. Copy & paste `dogs.json` into the `fixtures` directory. In `fixtures/dogs.json`, there are two `Dog` objects. Create two more `Dog` objects then run the command `python manage.py loaddata dogs.json`. You should see the following message in the terminal: `Installed 4 object(s) from 1 fixture(s)`.

Expected Output

Run the command `python manage.py runserver` then navigate to http://127.0.0.1:8000/practical08dog/



Breed	Height	Weight	Life Span	Adaptability	Friendliness	Grooming Needs	Trainability	Physical Needs
Afghand Hound	25 inches	55 pounds	11 years	High	High	Low	Medium	High
American Pugabull	16 inches	48 pounds	13 years	Medium	High	Medium	Medium	High
Basset Hound	14 inches	55 pounds	11 years	Medium	High	High	High	Low
Bichon Frise	10 inches	9 pounds	13 years	High	High	Low	Medium	High



No dogs available.

Deployment link: https://int-app-dev-practical-08.herokuapp.com/practical08dog/

Resources

- Django Model Reference
- Django Choices
- Django Fixtures