DJANGO ORM

BEYOND THE BASICS

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AGENDA

- What are QuerySets? How do they work?
- QuerySet API methods you might not know about
- Lookup Types
- Q objects
- Further Reading Topics

WHAT IS A QUERYSET?

- An object that represents a group of SQL queries
- You can use the QuerySet API to query the database on your application's behalf without knowing raw SQL
- QuerySets are lazy
- Raw SQL vs. QuerySets

```
In [1]: users = User.objects.all()

In [2]: print(users.query)

SELECT "users_user"."password", "users_user"."last_login",
"users_user"."is_superuser", "users_user"."username",
"users_user"."first_name", "users_user"."last_name", "users_user"."email",
"users_user"."is_staff", "users_user"."is_active", FROM "users_user"
```

QUERYSET API METHODS

- get vs. filter vs. exclude
- order_by
- aggregate
- annotate
- values/values_list
- earliest/latest

QUERYSET API METHODS

- Get returns one and only one object

```
>>> Book.objects.get(id=1)

<Book: 1>
```

- So use distinct fields

```
>>> Author.objects.get(first_name=“Bill”)

MultipleObjectsReturned: get() returned more than one Author --
it returned more than 20!
```

- Shortcuts are useful

```
>>> book_object = get_object_or_404(Book, id=1)

<Book: 1>
```

QUERYSET API METHODS

- Filter returns a QuerySet

```
>>> Book.objects.filter(category="Sci-Fi")

[<Book: 1>, <Book: 2>, <Book: 3>,'...(remaining elements truncated)...']
```

- Same as exclude

```
>>> Book.objects.exclude(average_review_stars=1)

[<Book: 1>, <Book: 2>, <Book: 3>,'...(remaining elements truncated)...']
```

- Which can be chained

```
>>> Book.objects.filter(category="Sci-Fi").exclude(average_review_stars=1)

[<Book: 1>, <Book: 2>]
```

QUERYSET API METHODS

- Aggregate allows you to a quick way to find Min, Max, Avg, Sum, StdDev, Variance

```
>>> Book.objects.aggregate(average_price=Avg('price'))
{'average_price': 34.35}
>>> Book.objects.aggregate(highest_stock=Max('quantity_in_stock'))
{'highest_stock': 350}
```

- Count is quick and easy

```
>>> Book.objects.filter(category="Sci-Fi").count()
20
```

QUERYSET API METHODS

- Annotate allows you to “attach” information to your objects in a QuerySet

```
>>> pubs = Publisher.objects.annotate(num_books=Count('book'))
>>> pubs
[<Publisher BaloneyPress>, <Publisher SalamiPress>, ...]
>>> pubs[0].num_books
73
```

QUERYSET API METHODS

- Values allows you to extract individual attribute data without having to get the whole object

```
>>> Blog.objects.values()

[{'id': 1, 'name': 'Beatles Blog', 'tagline': 'All the latest Beatles
news.'}],

>>> Blog.objects.values('id', 'name')

[{'id': 1, 'name': 'Beatles Blog'}]
```

- values_list behaves the same, except it gives tuples instead of dicts

```
>>> Entry.objects.values_list('id', 'headline')

[(1, 'First entry'), ...]

>>> Entry.objects.values_list('id', flat=True).order_by('id')

[1, 2, 3, ...]
```

QUERYSET API METHODS

- earliest/latest() are easy, useful date/datetime methods

```
>>> Entry.objects.latest(‘pub_date')


>>> Entry.objects.earliest('pub_date')
```

LOOKUP TYPES

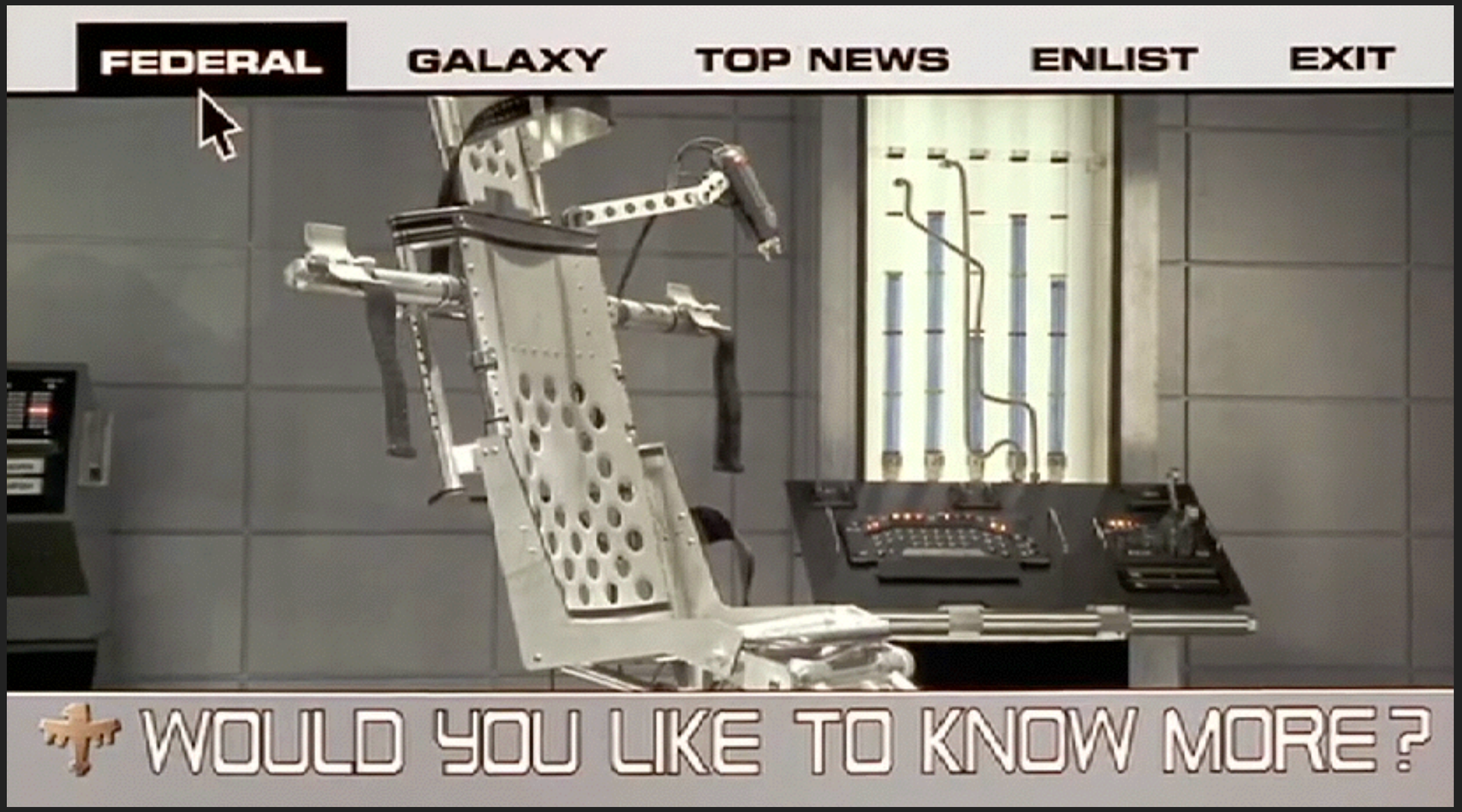
- (i)exact
- (i)contains
- in
- (i)startswith/(i)endswith
- lt(e)/gt(e)/range
- datetime lookup types
- (i)regex

Q OBJECTS

- “A Q Object is an object used to encapsulate a collection of keyword arguments”
- i.e. filter with conditionals (ANDs, ORs)

```
Poll.objects.get(
    Q(question__startswith='Who'),
    Q(pub_date=date(2005, 5, 2)) | Q(pub_date=date(2005, 5, 6))
)
```

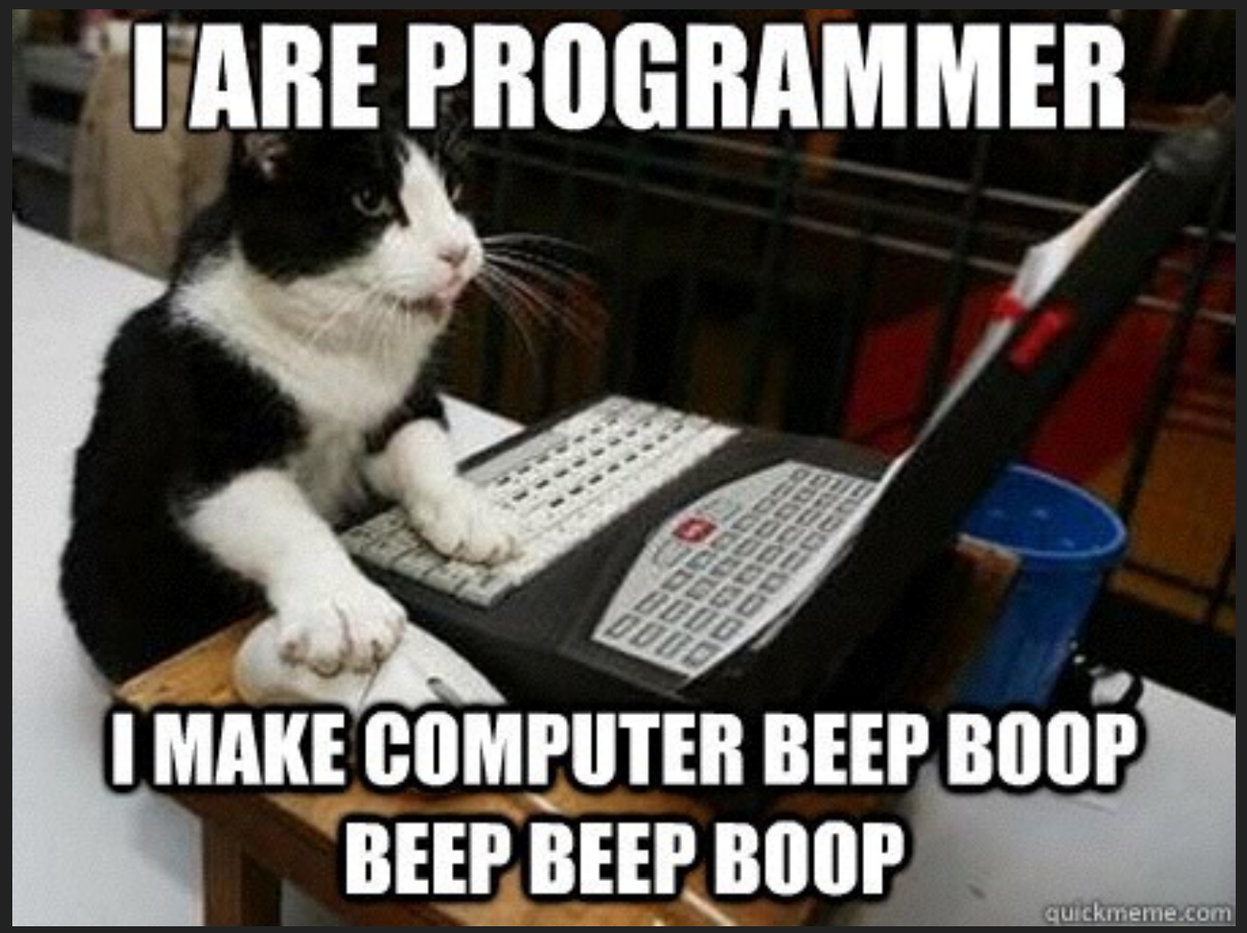
DJANGO ORM: BEYOND THE BASICS



- QuerySet API docs (methods, lookup types, etc.)
- Model Meta documentation (built-in and custom methods)
- QuerySet managers (advanced)
- F() Objects

QUESTIONS?

THANKS!



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* The majority of code samples were taken from the Django docs. We thank the DSF and all the OSS contributors for their hard work and dedication.