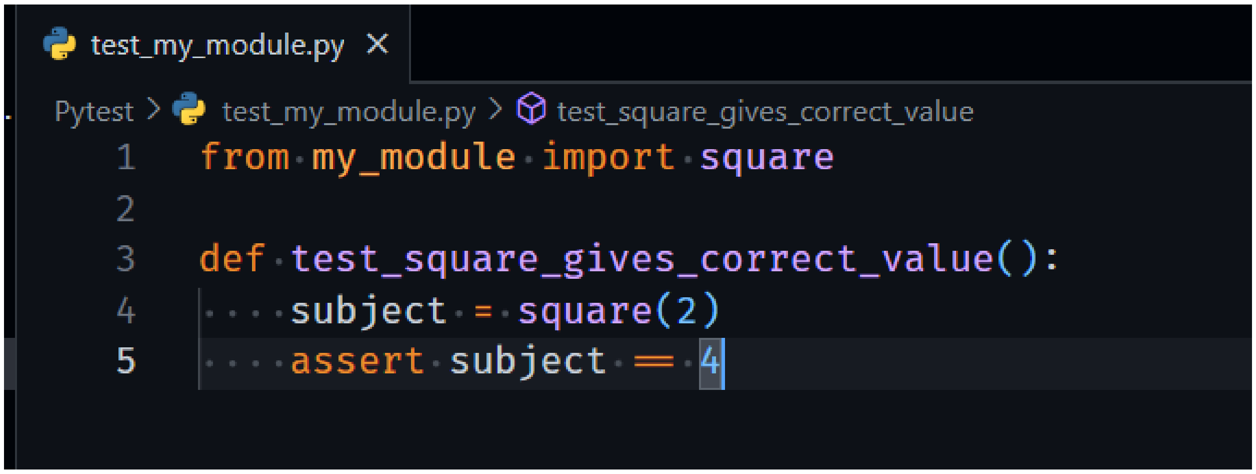
Zakaria CHOUKRI

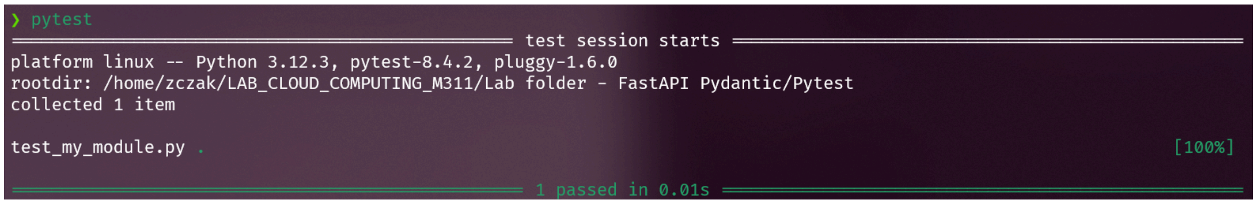
Lab FastAPI Pydantic - Cloud Computing - M311

1- Pytest

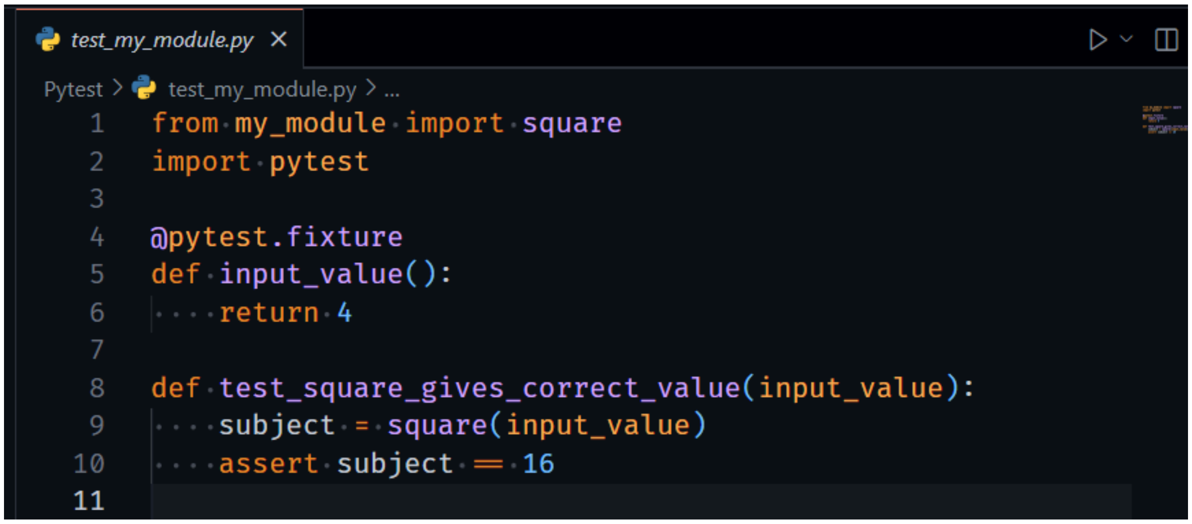


test_my_module.py
Pytest > test_my_module.py > test_square_gives_correct_value

```python
from my_module import square

def test_square_gives_correct_value():
    subject = square(2)
    assert subject == 4
```



```
❯ pytest
================================ test session starts ================================
platform linux -- Python 3.12.3, pytest-8.4.2, pluggy-1.6.0
rootdir: /home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic/Pytest
collected 1 item

test_my_module.py .                                                            [100%]

================================= 1 passed in 0.01s =================================
```



```python
from my_module import square
import pytest

@pytest.fixture
def input_value():
    return 4

def test_square_gives_correct_value(input_value):
    subject = square(input_value)
    assert subject == 16

```

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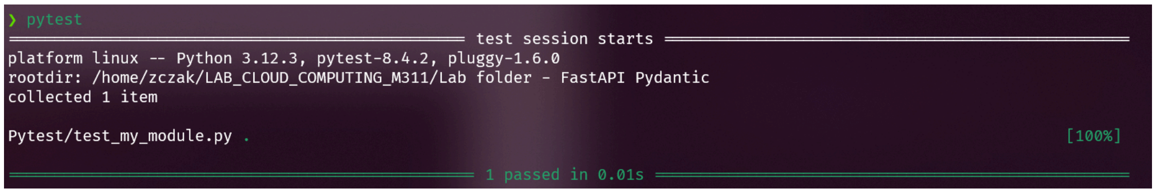
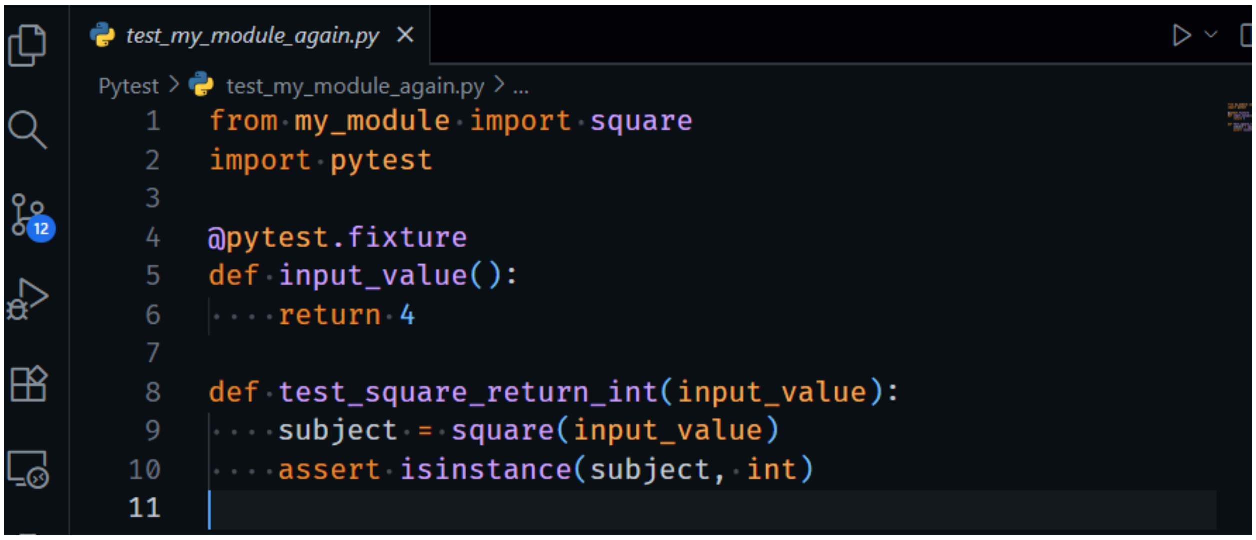


```
❯ pytest
================================ test session starts ================================
platform linux -- Python 3.12.3, pytest-8.4.2, pluggy-1.6.0
rootdir: /home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic
collected 1 item

Pytest/test_my_module.py .                                                    [100%]

================================= 1 passed in 0.01s =================================
```



test_my_module_again.py

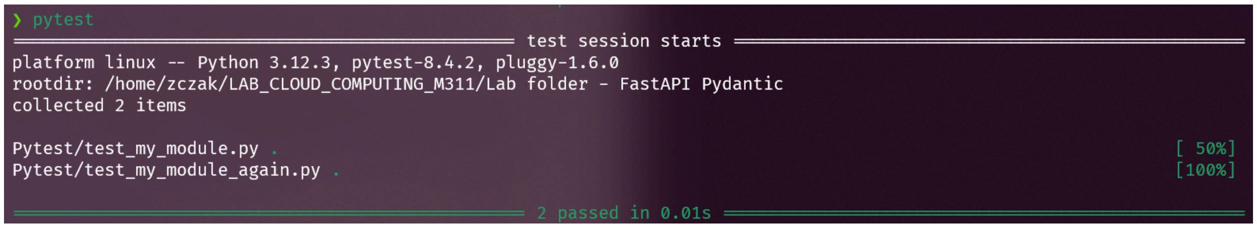
Pytest > test_my_module_again.py > ...

```python
from my_module import square
import pytest

@pytest.fixture
def input_value():
    return 4

def test_square_return_int(input_value):
    subject = square(input_value)
    assert isinstance(subject, int)

```

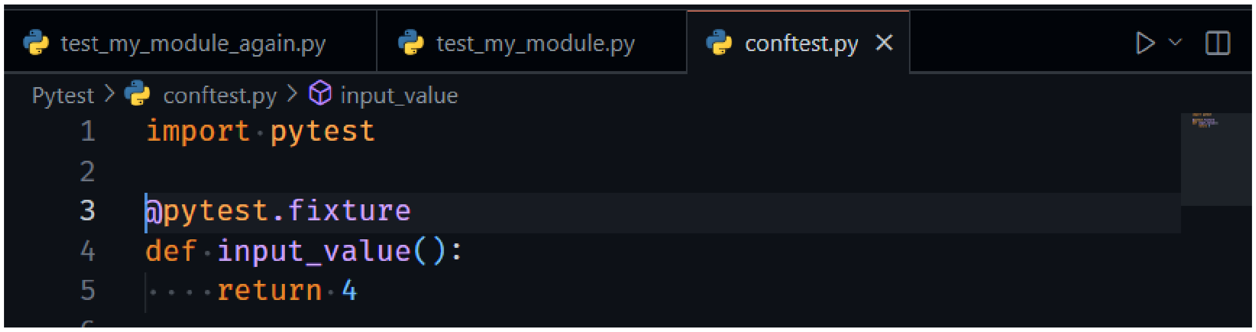


```
❯ pytest
================================ test session starts ================================
platform linux -- Python 3.12.3, pytest-8.4.2, pluggy-1.6.0
rootdir: /home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic
collected 2 items

Pytest/test_my_module.py .                                                    [ 50%]
Pytest/test_my_module_again.py .                                              [100%]

================================= 2 passed in 0.01s =================================
```

conftest.py



test_my_module_again.py | test_my_module.py | conftest.py

Pytest > conftest.py > input_value

```python
import pytest

@pytest.fixture
def input_value():
    return 4
```

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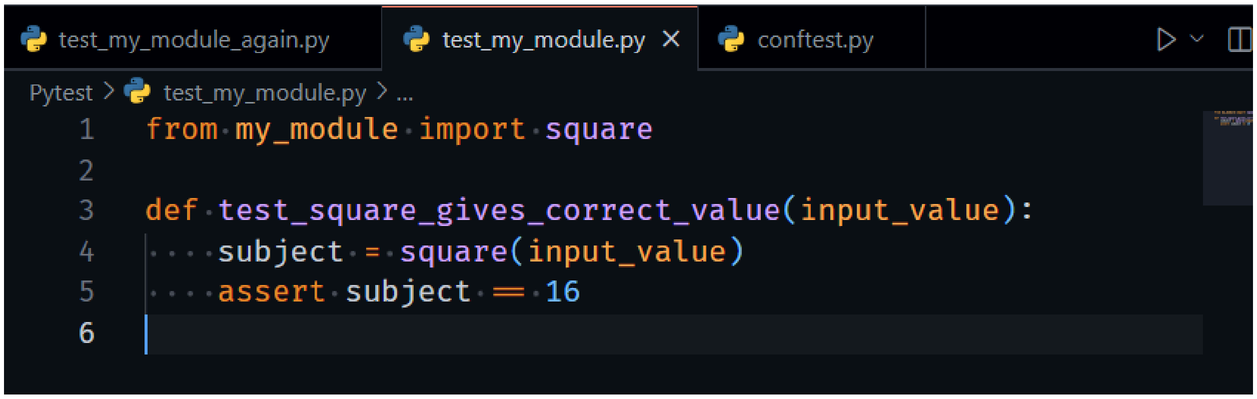
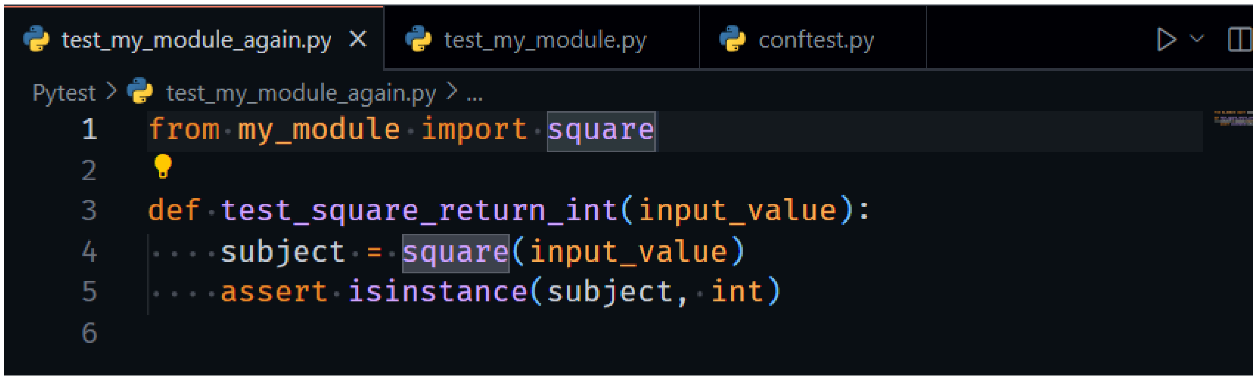

test_my_module_again.py | test_my_module.py | conftest.py

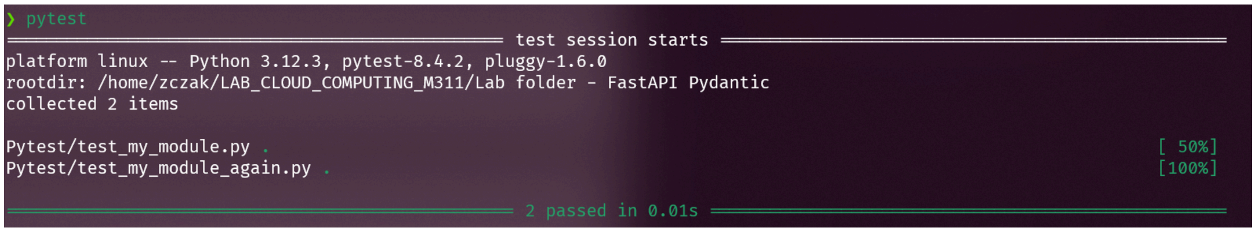
Pytest > test_my_module.py > ...

```python
from my_module import square

def test_square_gives_correct_value(input_value):
    subject = square(input_value)
    assert subject == 16
```


test_my_module_again.py | test_my_module.py | conftest.py

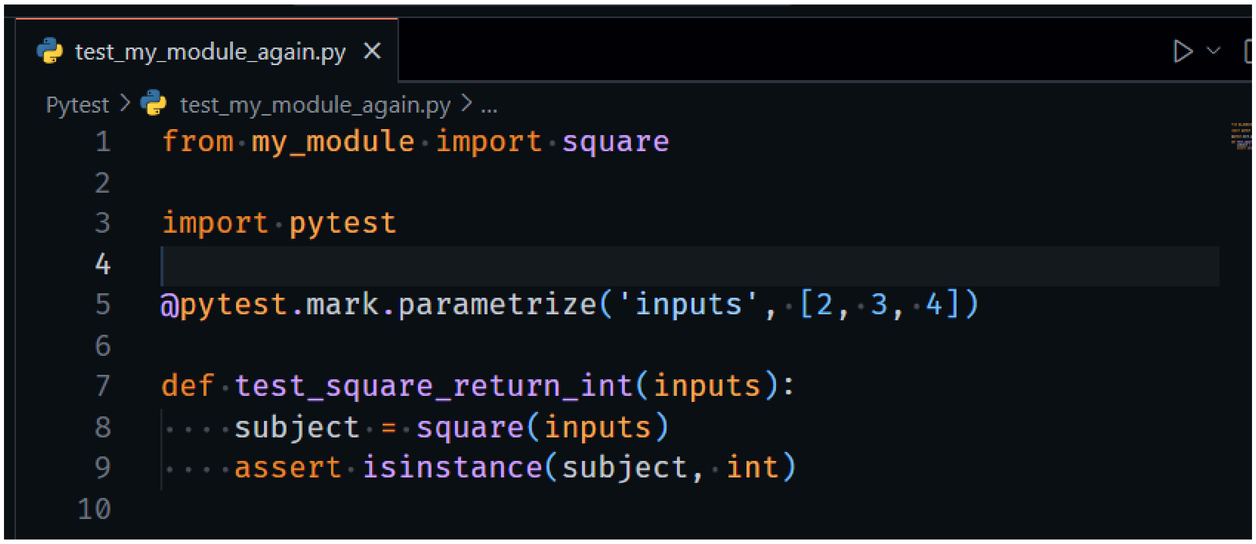
Pytest > test_my_module_again.py > ...

```python
from my_module import square

def test_square_return_int(input_value):
    subject = square(input_value)
    assert isinstance(subject, int)
```



```
❯ pytest
================================ test session starts ================================
platform linux -- Python 3.12.3, pytest-8.4.2, pluggy-1.6.0
rootdir: /home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic
collected 2 items

Pytest/test_my_module.py .                                                    [ 50%]
Pytest/test_my_module_again.py .                                              [100%]

================================= 2 passed in 0.01s =================================
```

Parametrized tests


test_my_module_again.py

Pytest > test_my_module_again.py > ...

```python
from my_module import square

import pytest

@pytest.mark.parametrize('inputs', [2, 3, 4])

def test_square_return_int(inputs):
    subject = square(inputs)
    assert isinstance(subject, int)
```

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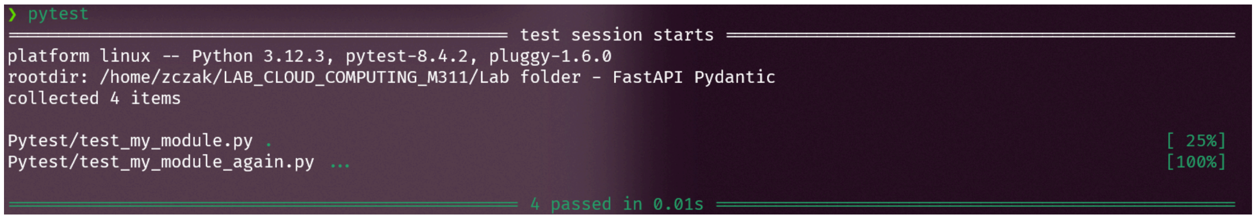
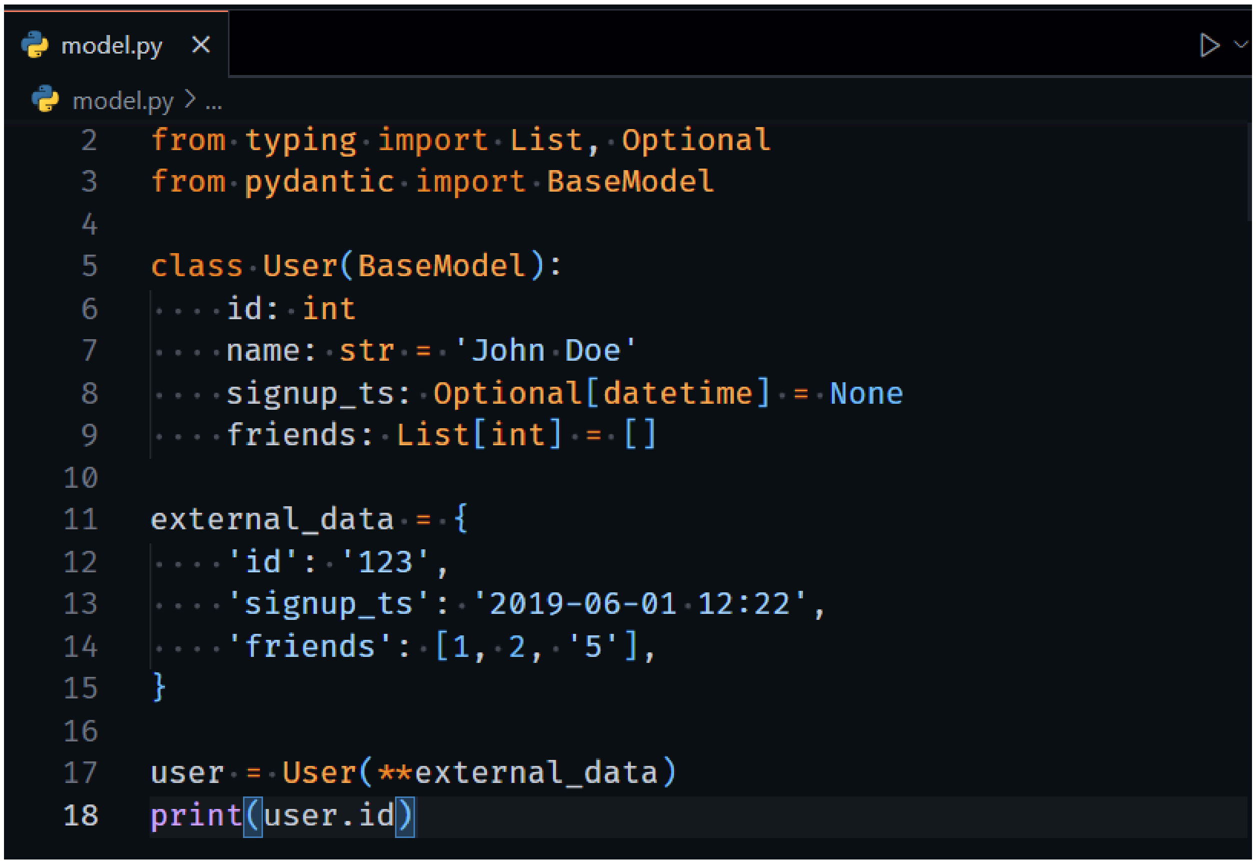
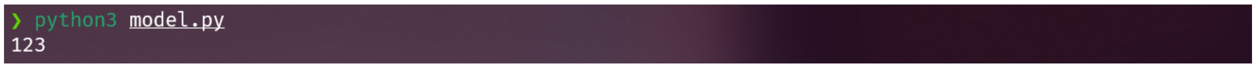


```
❯ pytest
============================= test session starts ==============================
platform linux -- Python 3.12.3, pytest-8.4.2, pluggy-1.6.0
rootdir: /home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic
collected 4 items

Pytest/test_my_module.py .                                               [ 25%]
Pytest/test_my_module_again.py ...                                       [100%]

============================== 4 passed in 0.01s ===============================
```

2- Pydantic

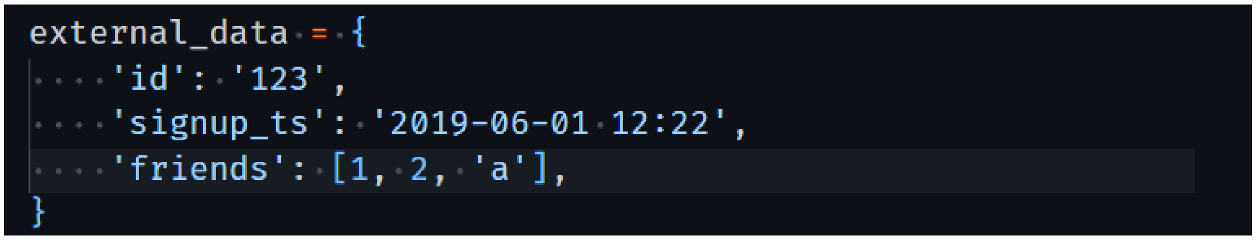


```python
from typing import List, Optional
from pydantic import BaseModel

class User(BaseModel):
    id: int
    name: str = 'John Doe'
    signup_ts: Optional[datetime] = None
    friends: List[int] = []

external_data = {
    'id': '123',
    'signup_ts': '2019-06-01 12:22',
    'friends': [1, 2, '5'],
}

user = User(**external_data)
print(user.id)
```



```
❯ python3 model.py
123
```

If we change ‘5’ to ‘a’ which cannot be converted to int:



```python
external_data = {
    'id': '123',
    'signup_ts': '2019-06-01 12:22',
    'friends': [1, 2, 'a'],
}
```

Throws an error

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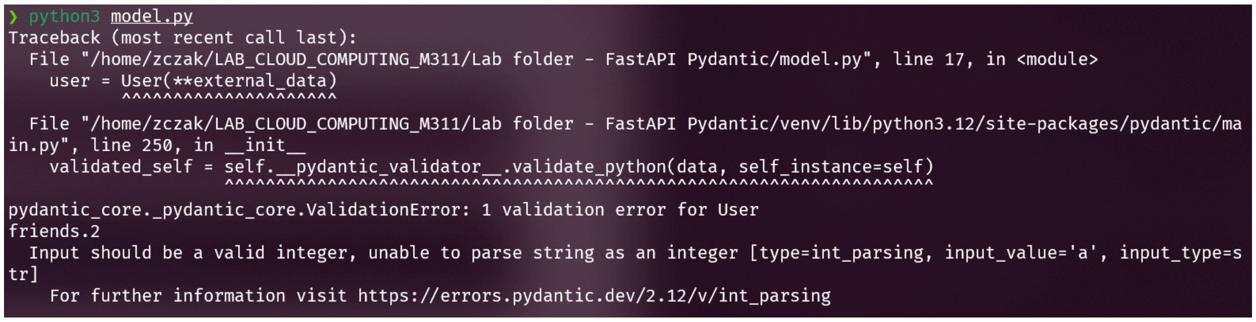
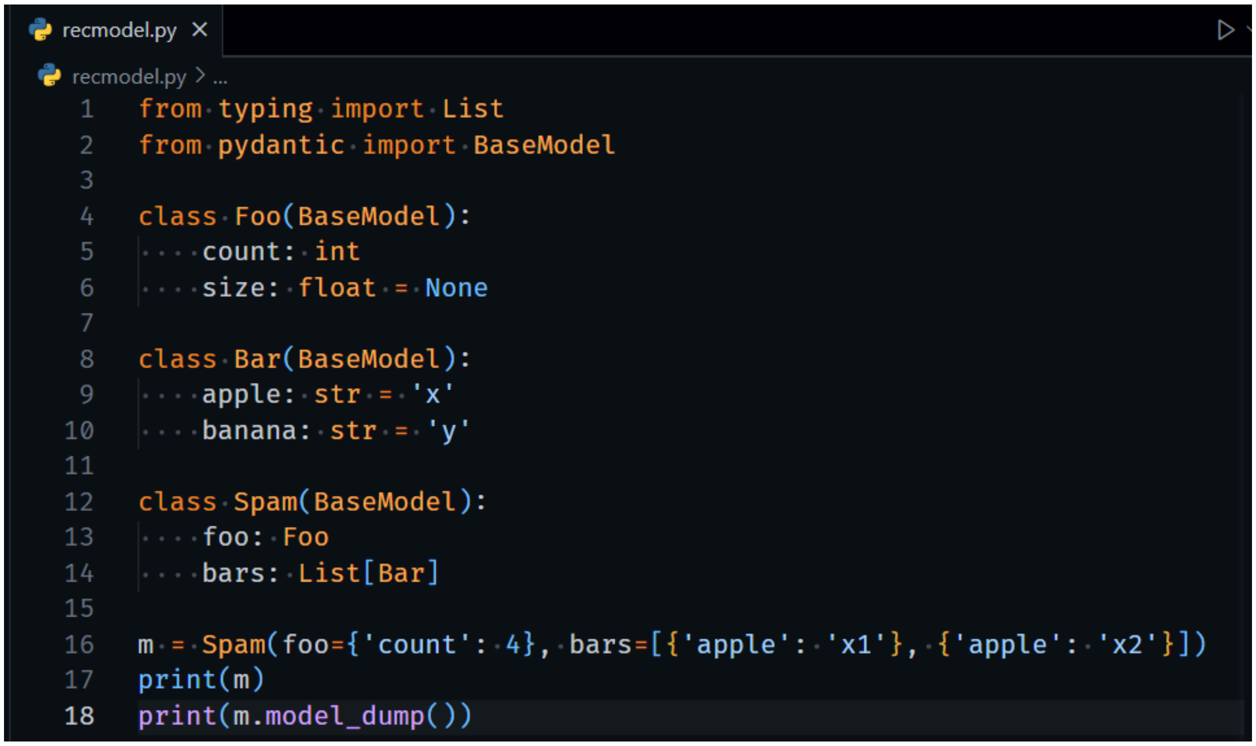


```
❯ python3 model.py
Traceback (most recent call last):
  File "/home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic/model.py", line 17, in <module>
    user = User(**external_data)
           ^^^^^^^^^^^^^^^^^^^^^
  File "/home/zczak/LAB_CLOUD_COMPUTING_M311/Lab folder - FastAPI Pydantic/venv/lib/python3.12/site-packages/pydantic/ma
in.py", line 250, in __init__
    validated_self = self.__pydantic_validator__.validate_python(data, self_instance=self)
                     ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
pydantic_core._pydantic_core.ValidationError: 1 validation error for User
friends.2
  Input should be a valid integer, unable to parse string as an integer [type=int_parsing, input_value='a', input_type=s
tr]
    For further information visit https://errors.pydantic.dev/2.12/v/int_parsing
```

Recursive models:



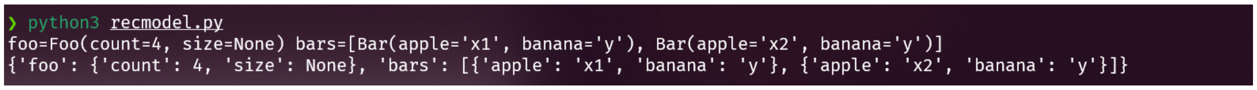
```python
from typing import List
from pydantic import BaseModel

class Foo(BaseModel):
    count: int
    size: float = None

class Bar(BaseModel):
    apple: str = 'x'
    banana: str = 'y'

class Spam(BaseModel):
    foo: Foo
    bars: List[Bar]

m = Spam(foo={'count': 4}, bars=[{'apple': 'x1'}, {'apple': 'x2'}])
print(m)
print(m.model_dump())
```



```
❯ python3 recmodel.py
foo=Foo(count=4, size=None) bars=[Bar(apple='x1', banana='y'), Bar(apple='x2', banana='y')]
{'foo': {'count': 4, 'size': None}, 'bars': [{'apple': 'x1', 'banana': 'y'}, {'apple': 'x2', 'banana': 'y'}]}
```

Validators are deprecated in Pydantic

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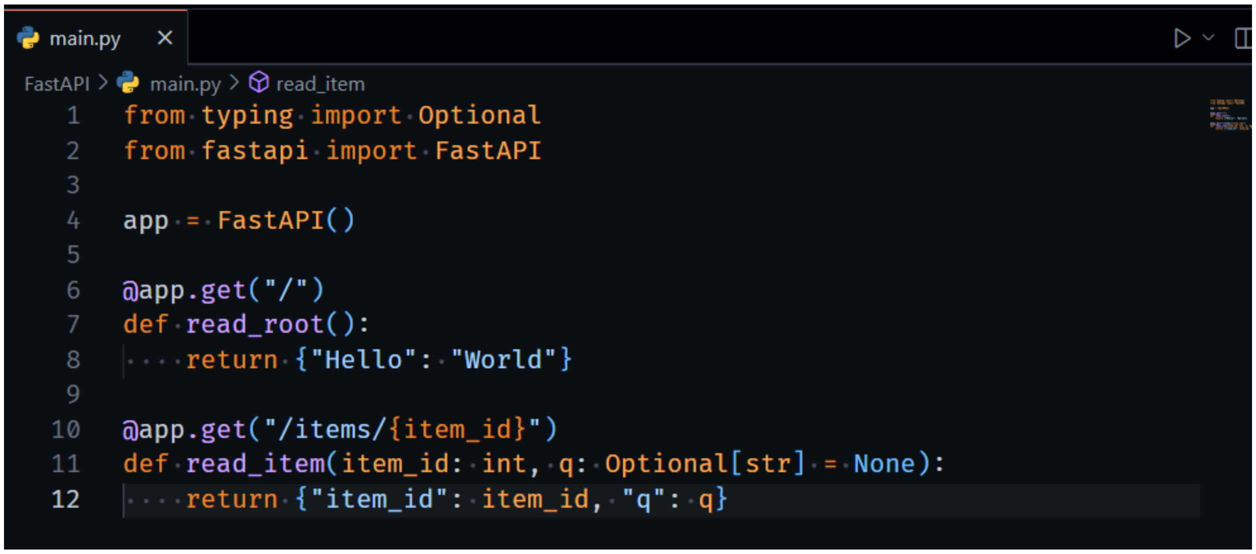
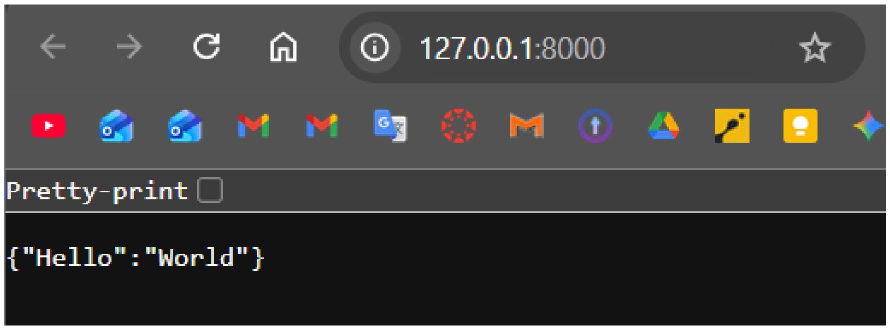
3- FastAPI


main.py

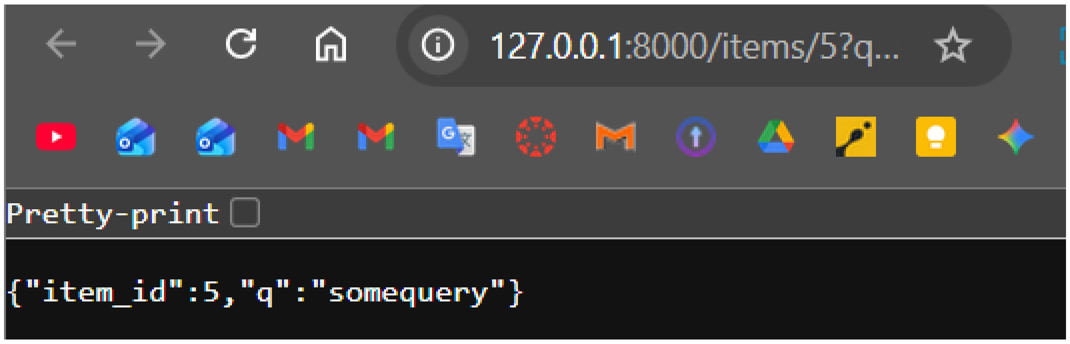
FastAPI > main.py > read_item

```python
from typing import Optional
from fastapi import FastAPI

app = FastAPI()

@app.get("/")
def read_root():
    return {"Hello": "World"}

@app.get("/items/{item_id}")
def read_item(item_id: int, q: Optional[str] = None):
    return {"item_id": item_id, "q": q}
```


127.0.0.1:8000

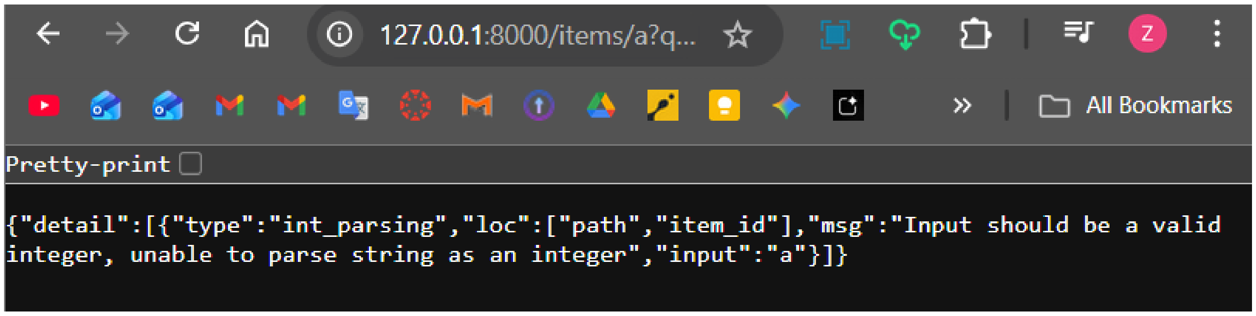
Pretty-print

```
{"Hello":"World"}
```


127.0.0.1:8000/items/5?q...

Pretty-print

```
{"item_id":5,"q":"somequery"}
```


127.0.0.1:8000/items/a?q...

All Bookmarks

Pretty-print

```
{"detail":[{"type":"int_parsing","loc":["path","item_id"],"msg":"Input should be a valid
integer, unable to parse string as an integer","input":"a"}]}
```

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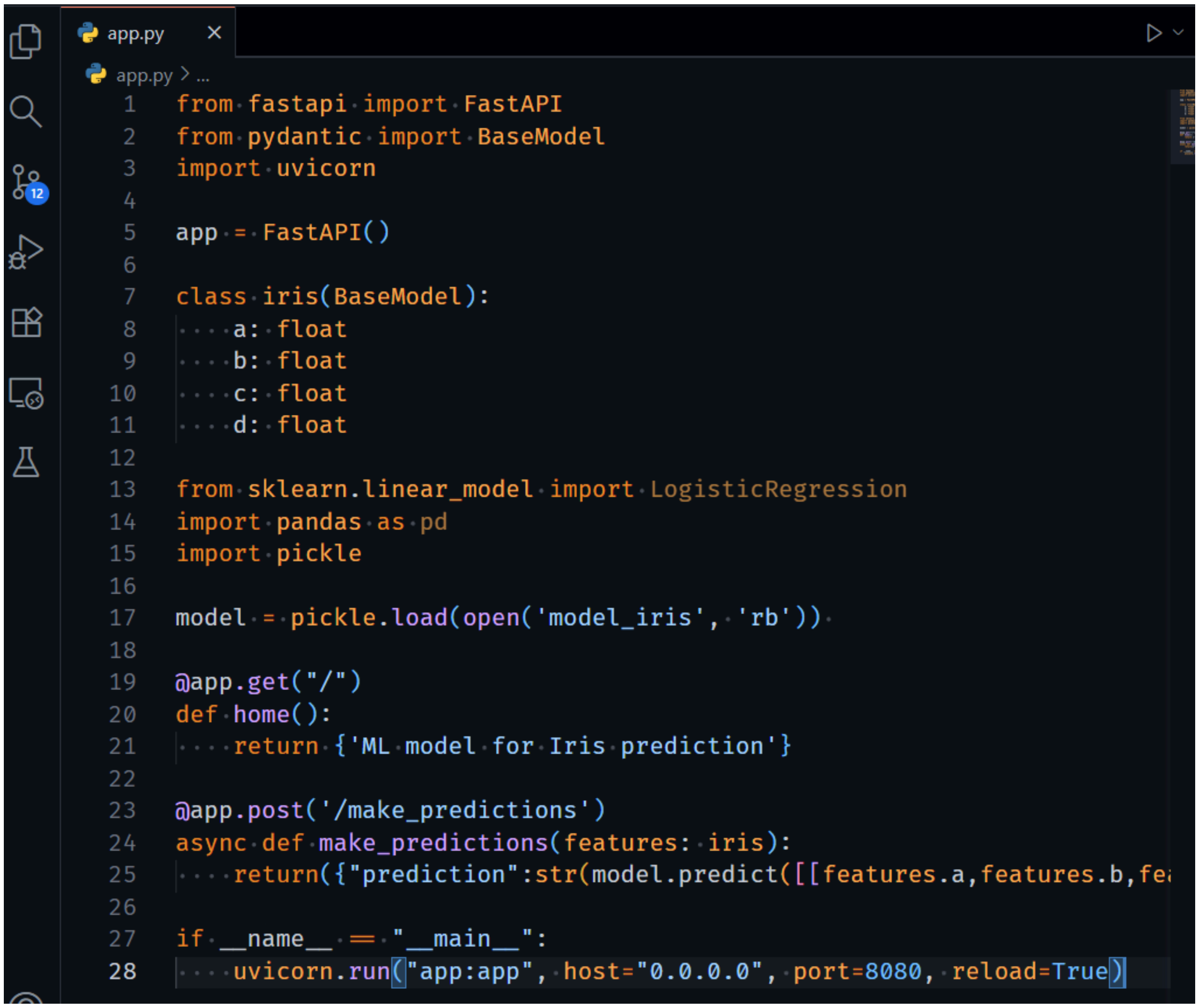
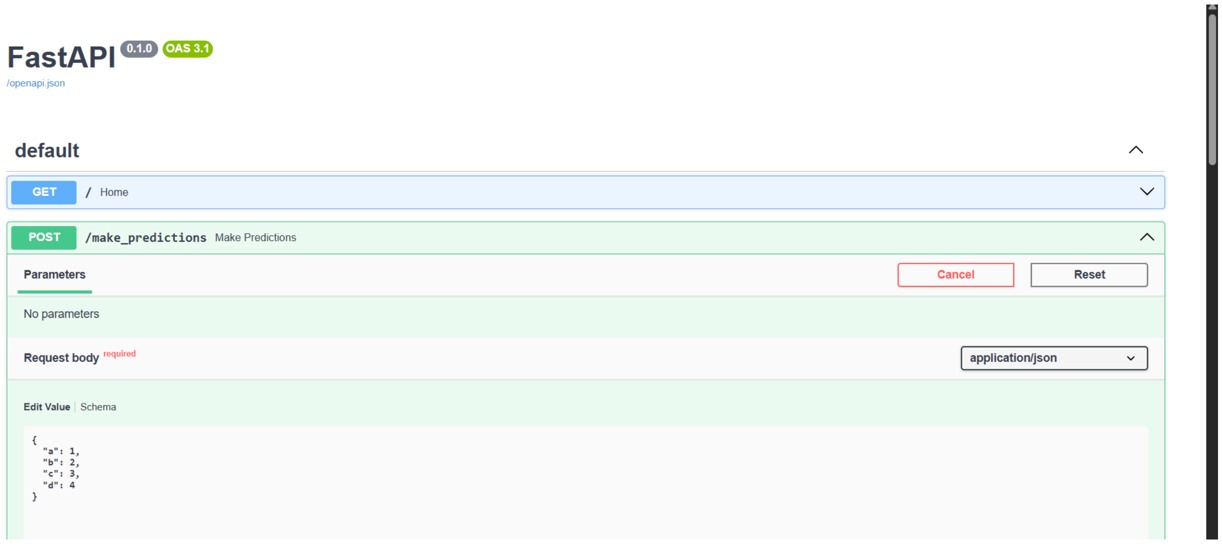


app.py

app.py > ...

```python
from fastapi import FastAPI
from pydantic import BaseModel
import uvicorn

app = FastAPI()

class iris(BaseModel):
    a: float
    b: float
    c: float
    d: float

from sklearn.linear_model import LogisticRegression
import pandas as pd
import pickle

model = pickle.load(open('model_iris', 'rb'))

@app.get("/")
def home():
    return {'ML model for Iris prediction'}

@app.post('/make_predictions')
async def make_predictions(features: iris):
    return({"prediction":str(model.predict([[features.a,features.b,fe

if __name__ == "__main__":
    uvicorn.run("app:app", host="0.0.0.0", port=8080, reload=True)
```



FastAPI 0.1.0 OAS 3.1

/openapi.json

default

GET / Home

POST /make_predictions Make Predictions

Parameters

Cancel Reset

No parameters

Request body required

application/json

Edit Value | Schema

```json
{
  "a": 1,
  "b": 2,
  "c": 3,
  "d": 4
}
```

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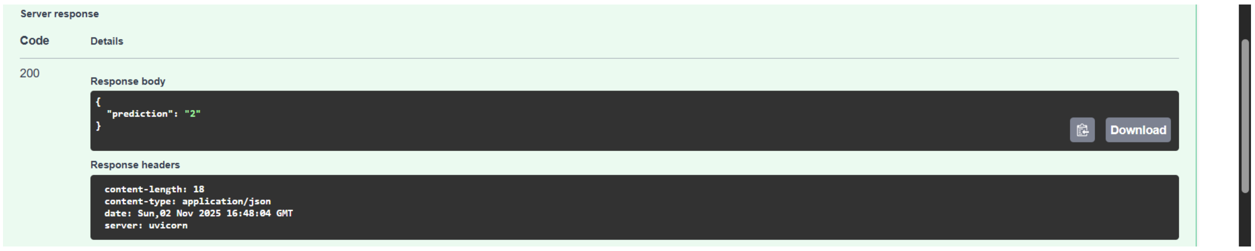

Server response

Code Details

200

Response body

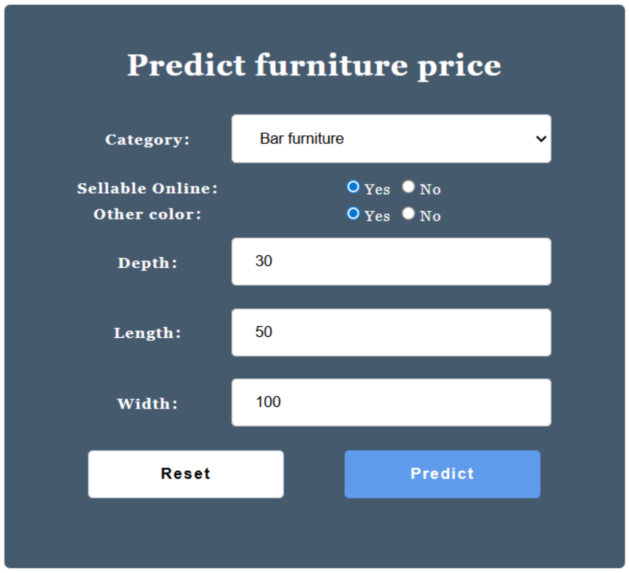
```
{
  "prediction": "2"
}
```

Response headers

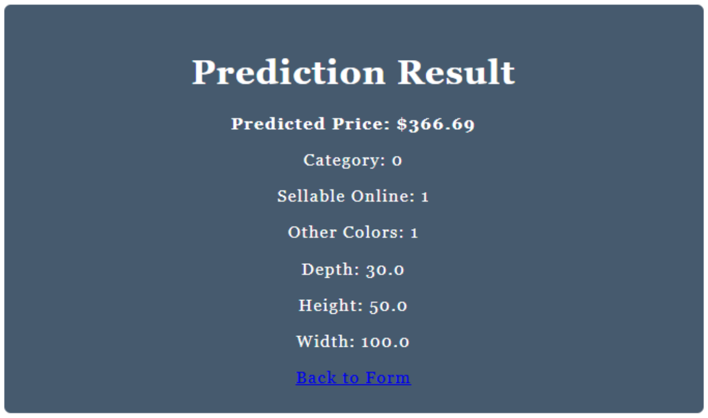
```
content-length: 18
content-type: application/json
date: Sun,02 Nov 2025 16:48:04 GMT
server: uvicorn
```

To Do:

Furniture dataset


Predict furniture price

Category:	Bar furniture
Sellable Online:	[✓ Yes] No
Other color:	[✓ Yes] No
Depth:	30
Length:	50
Width:	100


Prediction Result

Predicted Price: $366.69

Category: 0

Sellable Online: 1

Other Colors: 1

Depth: 30.0

Height: 50.0

Width: 100.0

Back to Form

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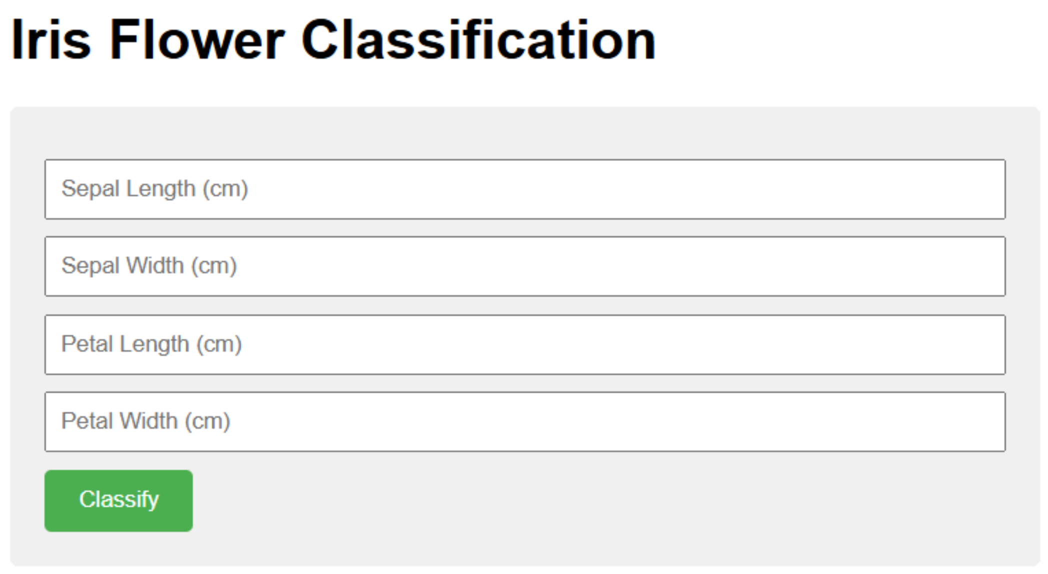
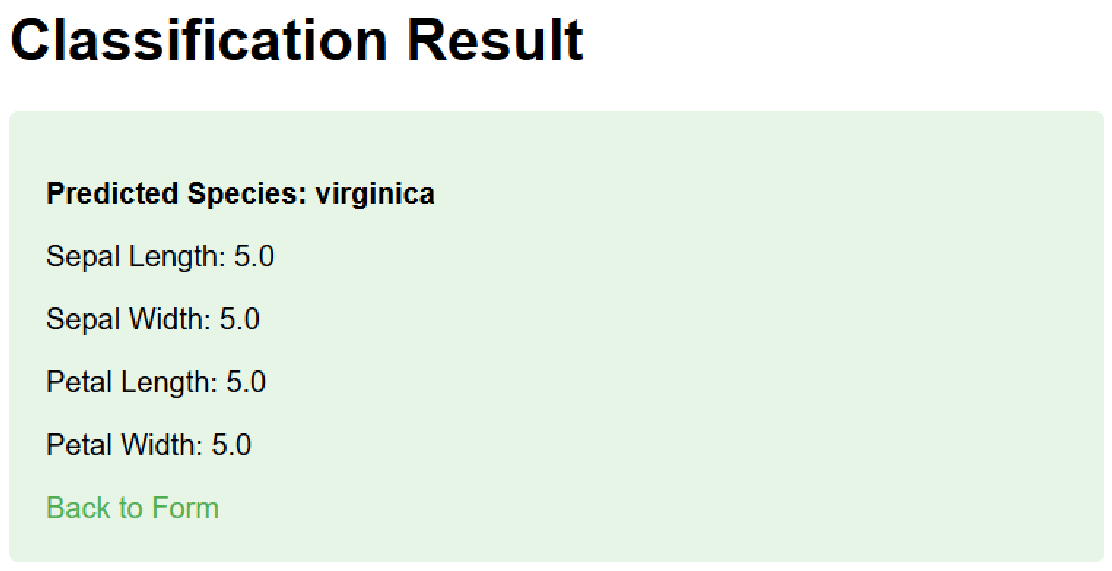
Iris dataset



Iris Flower Classification



Classification Result

Predicted Species: virginica

Sepal Length: 5.0

Sepal Width: 5.0

Petal Length: 5.0

Petal Width: 5.0