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AI Practical 1

Aim : Create a weather expert system in python with help of the Experta library.

Objectives :

- **This system should help its users in making a decision regarding "what you should bring when walking out of the house?" (i.e. an umbrella, a raincoat, or nothing).**
- **Your system must ask user questions.**
- **For example, the system can ask - Is it raining? (y/n) and Is it windy? (y/n)**
- **Explore other questions and add knowledge based on that to make the system compatible with additional knowledge. (Add minimum 5 questions)**

Code :

```
from experta import *
from PIL import Image
from IPython.display import display
import requests


class Season(Fact):
   pass


class WeatherExpert(KnowledgeEngine):
   @Rule(Season(name="Summer"))
   def summer(self):
       answer = (
           "You should bring a hat, sunglasses, and sunscreen! It's SUMMER season!"
       )
       print(answer)
       print("")
       image_url =
"https://images.unsplash.com/photo-1507525428034-b723cf961d3e?ixid=MnwxMjA3fDB8MHxzZW
FyY2h8MXx8c3VtbWVyfGVufDB8fDB8fA%3D%3D&ixlib=rb-1.2.1&w=1000&q=80"
       image_data = requests.get(image_url, stream=True).raw
       img = Image.open(image_data)
       display(img)
```

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```
   @Rule(Season(name="Rainy"))
   def rainy(self):
       answer = "You should bring an umbrella, a raincoat, and waterproof shoes! It's
RAINY surprise!"
       print(answer)
       print("")
       image_url =
"https://images.unsplash.com/photo-1428592953211-077101b2021b?ixid=MnwxMjA3fDB8MHxzZW
FyY2h8MXx8cmFpbnl8ZW58MHx8MHx8&ixlib=rb-1.2.1&w=1000&q=80"
       image_data = requests.get(image_url, stream=True).raw
       img = Image.open(image_data)
       display(img)

   @Rule(Season(name="Winter"))
   def winter(self):
       answer = "You should bring a coat, gloves, and a scarf! It's WINTER period!"
       print(answer)
       print("")
       image_url =
"https://images.unsplash.com/photo-1511131341194-24e2eeeebb09?ixid=MnwxMjA3fDB8MHxzZW
FyY2h8MXx8d2ludGVyfGVufDB8fDB8fA%3D%3D&ixlib=rb-1.2.1&w=1000&q=80"
       image_data = requests.get(image_url, stream=True).raw
       img = Image.open(image_data)
       display(img)

   @Rule(Season(name="Spring"))
   def spring(self):
       answer = "You should bring a light jacket, a hat, and some allergy pills! It's
SPRING season!"
       print(answer)
       print("")
       image_url =
"https://images.unsplash.com/photo-1459411552884-841db9b3cc2a?ixid=MnwxMjA3fDB8MHxzZW
FyY2h8MXx8c3ByaW5nfGVufDB8fDB8fA%3D%3D&ixlib=rb-1.2.1&w=1000&q=80"
       image_data = requests.get(image_url, stream=True).raw
       img = Image.open(image_data)
       display(img)
```

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```
    @Rule(Season(name="Autumn"))
    def autumn(self):
        answer = (
            "You should bring a sweater, a camera, and some snacks! It's AUTUMN
season!"
        )
        print(answer)
        print("")
        # I have chosen this image URL from the first website
        image_url =
"https://images.pexels.com/photos/235621/pexels-photo-235621.jpeg?auto=compress&cs=ti
nysrgb&dpr=1&w=500"
        image_data = requests.get(image_url, stream=True).raw
        img = Image.open(image_data)
        display(img)

    @Rule(Season(name="Windy"))
    def windy(self):
        answer = "You should bring a windbreaker, a hair tie, and some ear plugs! It's
WINDY!"
        print(answer)
        print("")
        image_url =
"https://images.unsplash.com/photo-1505672678657-cc7037095e60?ixid=MnwxMjA3fDB8MHxzZW
FyY2h8MXx8d2luZHl8ZW58MHx8MHx8&ixlib=rb-1.2.1&w=1000&q=80"
        image_data = requests.get(image_url, stream=True).raw
        img = Image.open(image_data)
        display(img)

    @Rule(Season(name="None"))
    def none(self):
        answer = "SORRY! Can not predict the weather."
        print(answer)
        print("")
        # I have chosen this image URL from the third website
        image_url = (
            "https://media.gettyimages.com/photos/sorry-picture-id157532044?s=612x612"
        )
        image_data = requests.get(image_url, stream=True).raw
```

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```
        img = Image.open(image_data)
        display(img)


print(
    "Hey there, I am YSL AI Weather Assistant System. I can suggest you what to bring when you walk out of the house based on the season. Just answer a few questions and I will give you some advice."
)
print("")

questions = [
    "Do you see a lot of sunshine? ",
    "Do you hear thunderstorms? ",
    "Do you feel cold? ",
    "Do you see snowflakes? ",
    "Do you smell flowers? ",
    "Do you see colorful leaves? ",
    "Do you feel strong winds? ",
]

answers = []
for question in questions:
    answer = input(question)
    answers.append(answer)
print("")

expected_answers = [
    (("y", "n", "n", "n", "n", "n", "n"), "Summer"),
    (("n", "y", "n", "n", "n", "n", "n"), "Rainy"),
    (("n", "n", "y", "y", "n", "n", "n"), "Winter"),
    (("n", "n", "y", "n", "n", "n", "n"), "Winter"),
    (("n", "n", "n", "n", "y", "n", "n"), "Spring"),
    (("n", "n", "n", "n", "n", "y", "n"), "Autumn"),
    (("n", "n", "n", "n", "n", "n", "y"), "Windy"),
    (("n", "n", "n", "n", "n", "n", "n"), "None"),
]

season = next(
```

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```
    (name for expected, name in expected_answers if answers == list(expected)), "None"
)

engine = WeatherExpert()
engine.reset()
engine.declare(Season(name=season))
engine.run()
```

Output :