

APIS

REMINDERS AND INFO

- Final on May 6th 12-2pm
 - Make sure you sign up with Weingarten ASAP
- HW09: **What to Watch?** Part 1 Released now, due April 22 @ 11:59pm
 - last opportunity to use late tokens if you want; NO LATE TOKENS ON PART 2
 - Part 2 comes out later tomorrow, due April 29th at 11:59pm
 - These assignments cannot be dropped
- Wednesday & Friday: in-class practice for recommendations
- Monday, 4/27: **no class**
- Wednesday, 4/29: final lecture: *what comes next after CIS 1100?*

WHAT WE'RE DOING TODAY

WILL be very useful if you're ever trying to gather data, do data analysis, etc.

The roadmap:

- How does the internet work on a high level
- What is an API
- How to use an API

EVERY COMPUTER HAS AN ADDRESS



127.0.0.1



2.5.687.09



43.6.72.834



31.42.0.1



142.37.4.89

WEBSITES LIVE ON COMPUTERS



127.0.0.1



2.5.687.09



43.6.72.834

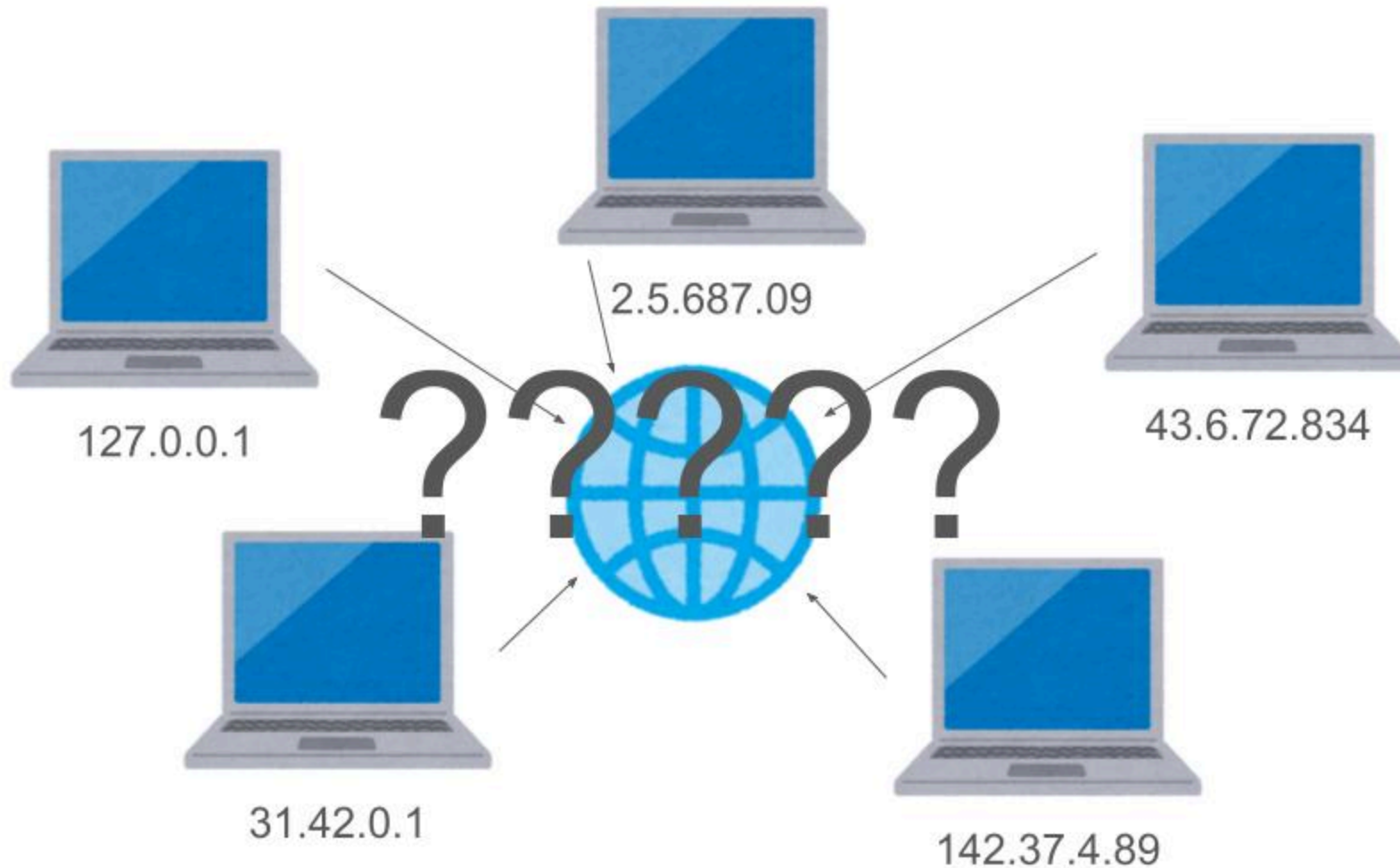


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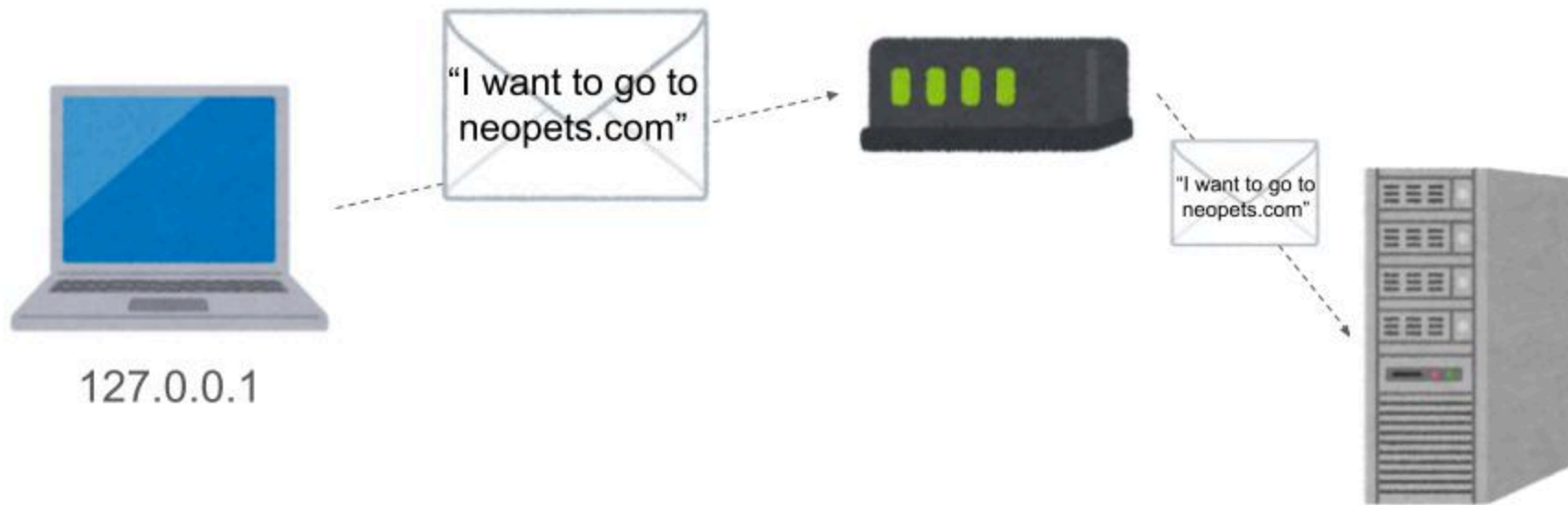
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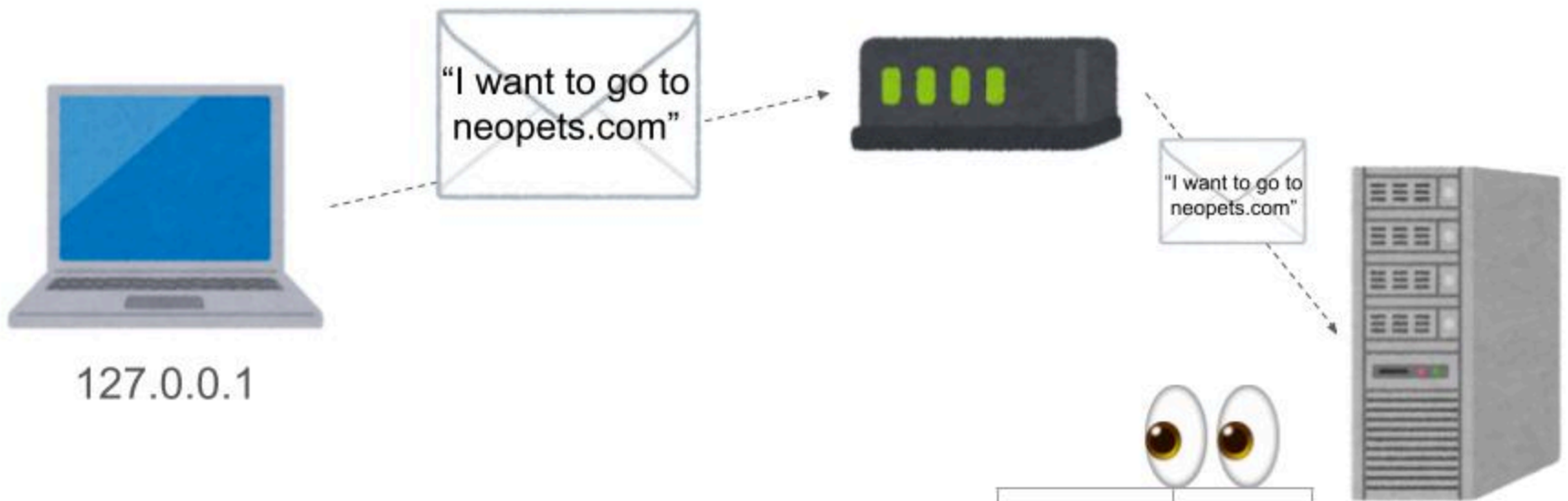
SO HOW DO COMPUTERS GET TO SEE WEBSITES?



HOW THE INTERNET WORKS (VERY ABSTRACTLY)



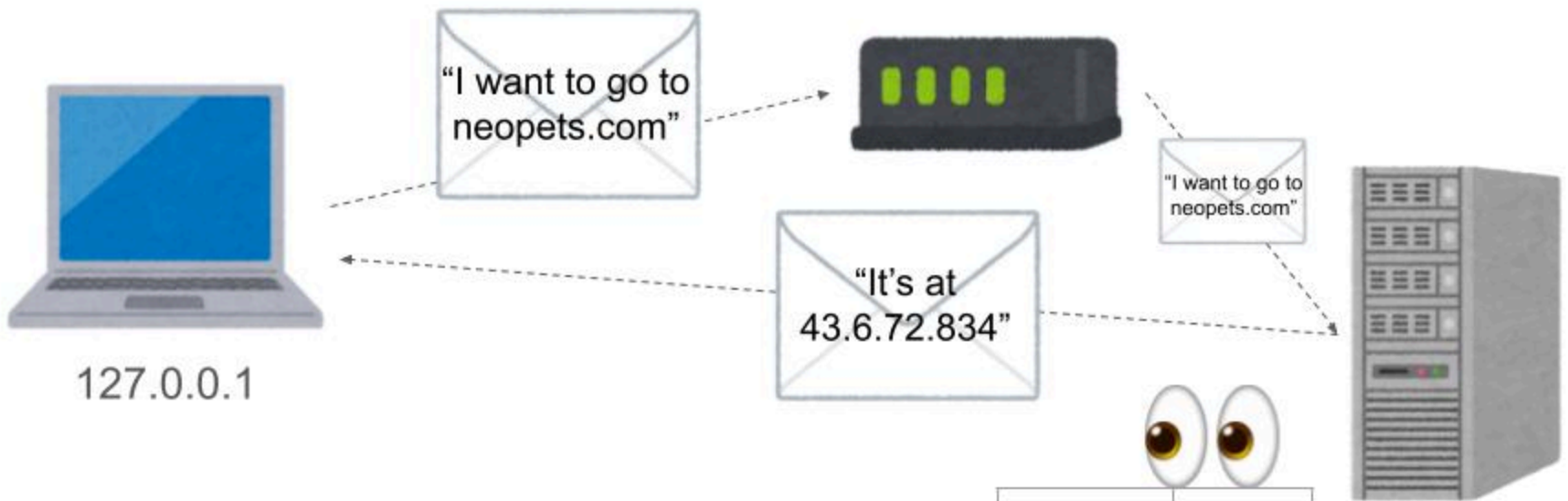




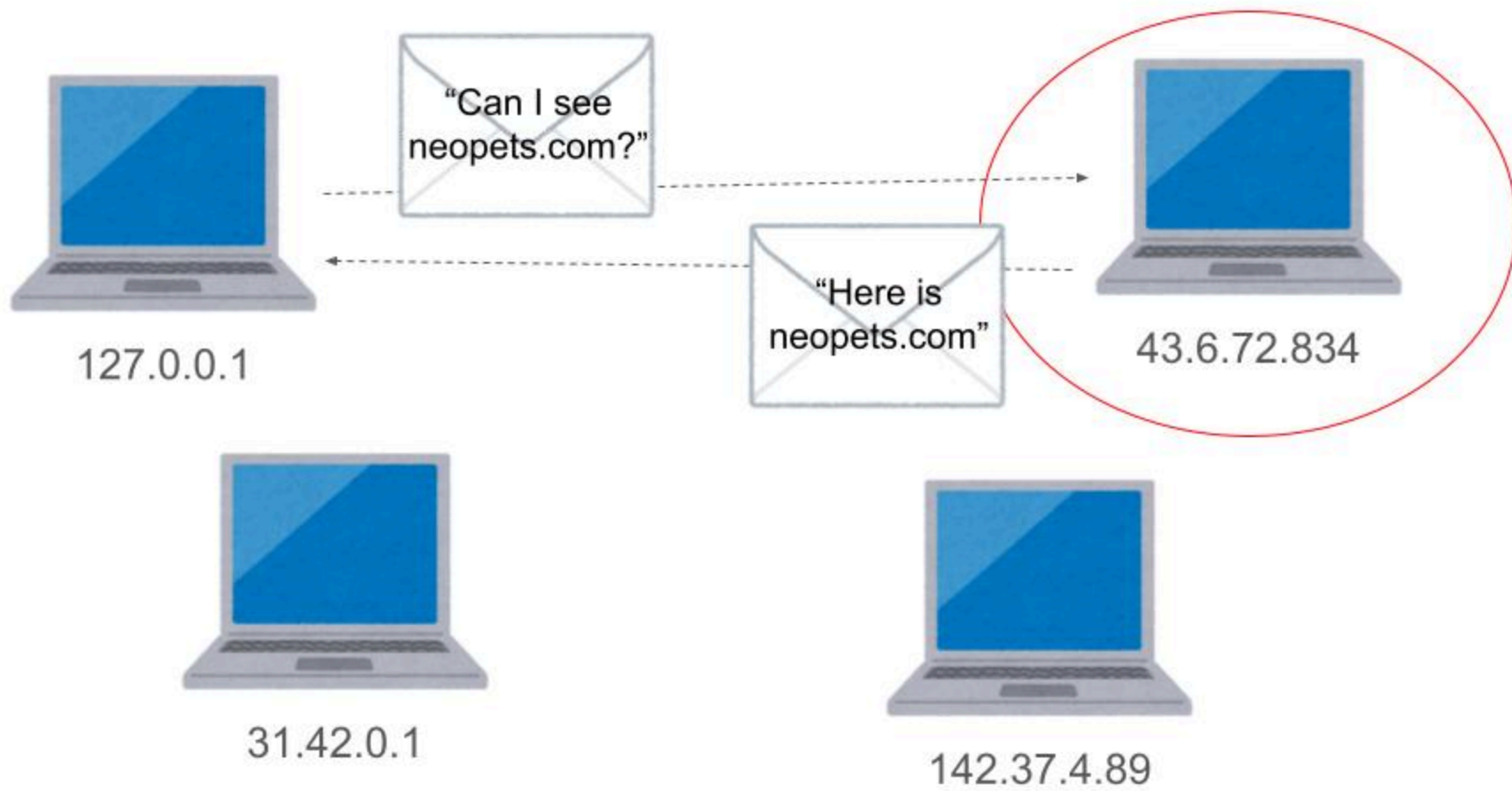
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google.com	157.30.28.1
neopets.com	43.6.72.834
sesame.street	123.12.3.1
...	...

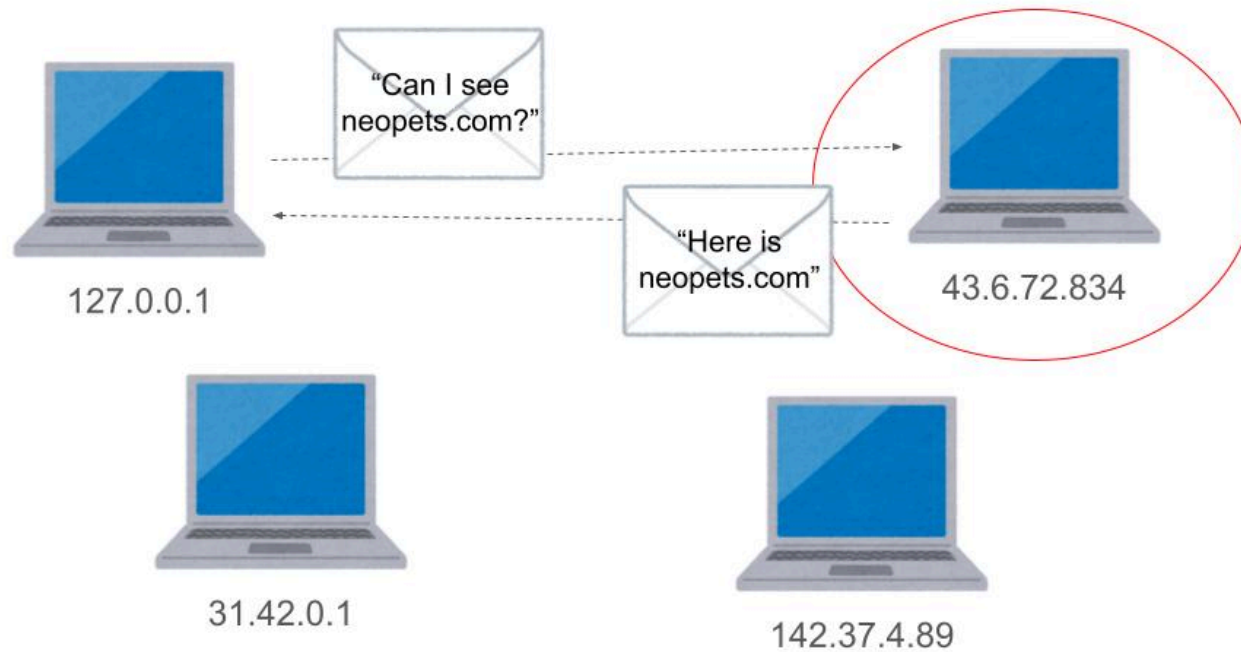


google.com	157.30.28.1
neopets.com	43.6.72.834
sesame.street	123.12.3.1
...	...



APIS

The part we want to focus on today is that last step



WHAT IS AN API?

API stands for Application Programming Interface

It's a way for a computer to programmatically make calls or changes to another program's **state**: the information that is held/stored by a program.

There are many types of APIs, but today we'll talk about REST APIs, which you're most likely to see

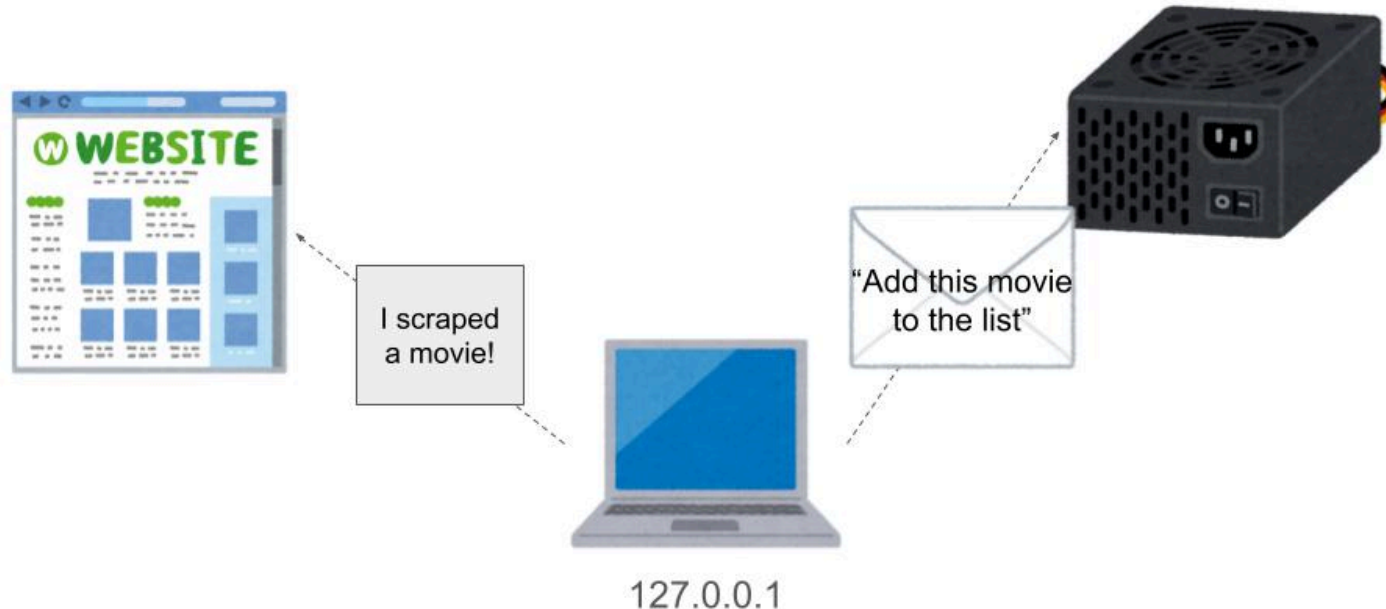
WHAT DOES REST MEAN?

REST stands for "Representational State Transfer", but it's really just a set of rules for how to build an API.

The classic example is to think of an API as a waiter in a restaurant. You know what you want, the kitchen knows how to make it, but you need the waiter to pass the information from you to the kitchen and then get the food back to you.

CONSIDER MOVIE RECOMMENDATIONS

In your homework, you've been gathering movie data to make recommendations. But what if you were doing the scraping on your computer but *storing the data* elsewhere?



API SETUP

You can create APIs! I'm not going to go over it today, but you can do it and it's quite simple. **Flask** is a popular framework in which to do this for python.

There are four different types of actions you can take with a typical API:

- **CREATE** a new data entry (row)
- **READ** some information I have stored
- **UPDATE** an existing data entry
- **DELETE** an existing data entry

API SETUP

You can setup APIs! I'm not going to go over it today, but you can do it and it's quite simple. **Flask** is a popular framework in which to do this for python.

There are four different types of actions you can take with a typical API:

- **CREATE** a new data entry (row) --> **POST**
- **READ** some information I have stored --> **GET**
- **UPDATE** an existing data entry --> **PUT**
- **DELETE** an existing data entry --> **DELETE**

API SETUP

So you can tell a REST API what type of action you want to take using `POST`, `GET`, `PUT` or `DELETE` but how does the computer know what to do that action on?

Endpoints are "urls" that tell the computer what data you want to take the action on

An API call will contain both an **action** and an **endpoint** and sometimes also **data**

LET'S SEE IT IN ACTION

```
import requests

url = "https://catfact.ninja/fact"
response = requests.get(url)

print(response.json())
```

ACTIVITY: LET'S DO IT!

Go to the catfact website: <https://catfact.ninja>

Then, in Codio, make a **GET** request to get a list of cat breeds.

Here's what I wrote earlier to get a fact:

```
import requests

url = "https://catfact.ninja/fact"
response = requests.get(url)

print(response.json())
```

API KEYS

We don't want just anyone looking at or making changes to our data; want to make sure that people...

1. are who they say they are
2. are verified to make changes

We can use API keys as "passwords" for access to our API.

This is very common practice and most APIs will require you to get an API key before accessing their API.

LET'S TRY GROQ

Groq (no, not that other one 👉) is an LLM with a freely available API. Let's get an API key and see how they work!

<https://console.groq.com/home>

Display all available models:

```
API_KEY = "<your_api_key>"
url = "https://api.groq.com/openai/v1/models"
headers = {
    "Authorization": f"Bearer {API_KEY}",    # "who are you?"
    "Content-Type": "application/json"
}

# requests.get makes a GET request
response = requests.get(url, headers=headers)

# we get back a response with a json in it
data = response.json()
print(data)
```

L11 What is the official ID for the GPT OSS model with 120 billion parameters?


```
API_KEY = "<your_api_key>"
url = "https://api.groq.com/openai/v1/chat/completions"
message = "Say hello in a fun way that is not extremely embarrassing!"
headers = {
    "Authorization": f"Bearer {API_KEY}",
    "Content-Type": "application/json"
}
body = {
    "model": "openai/gpt-oss-120b",
    "messages": [
        {"role": "user", "content": message}
    ]
}
response = requests.post(url, headers=headers, json=body) # POST!
data = response.json()
```



C12 Can you write an expression that prints just the message response? Explore!