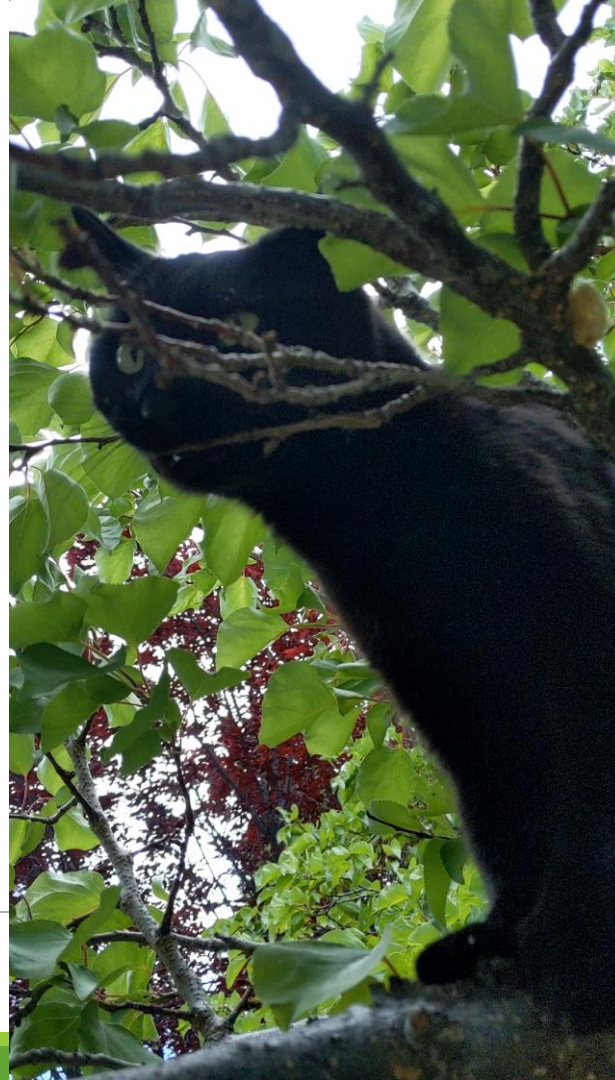


# Systems

ERIN KEITH



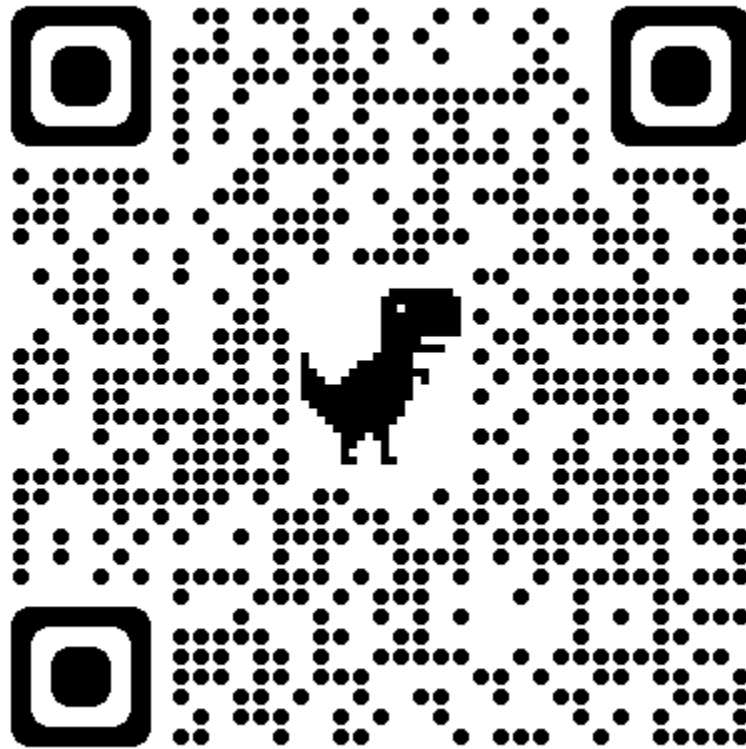
# Goals

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1. Explore APIs as outside data sources
2. Introduce ETL design pattern

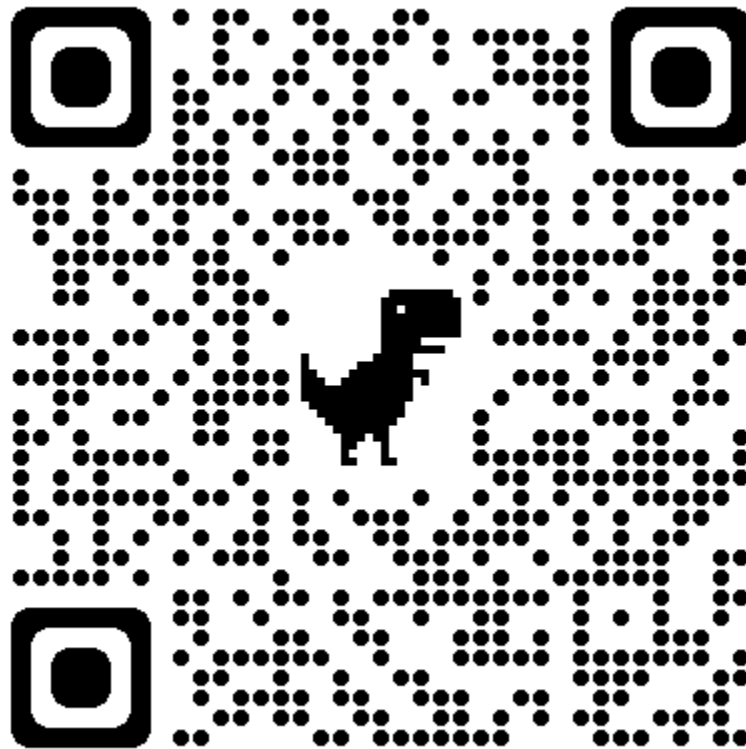
# The Internet

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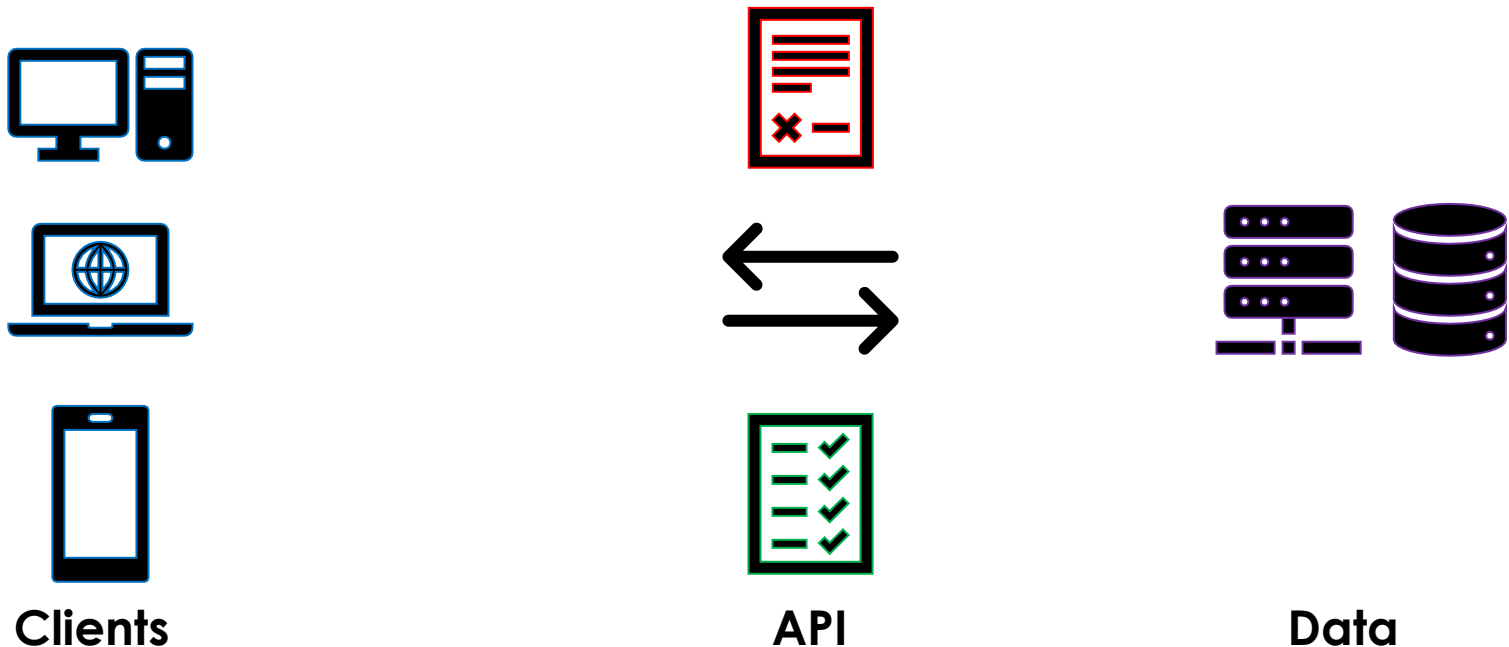
# Restful APIs

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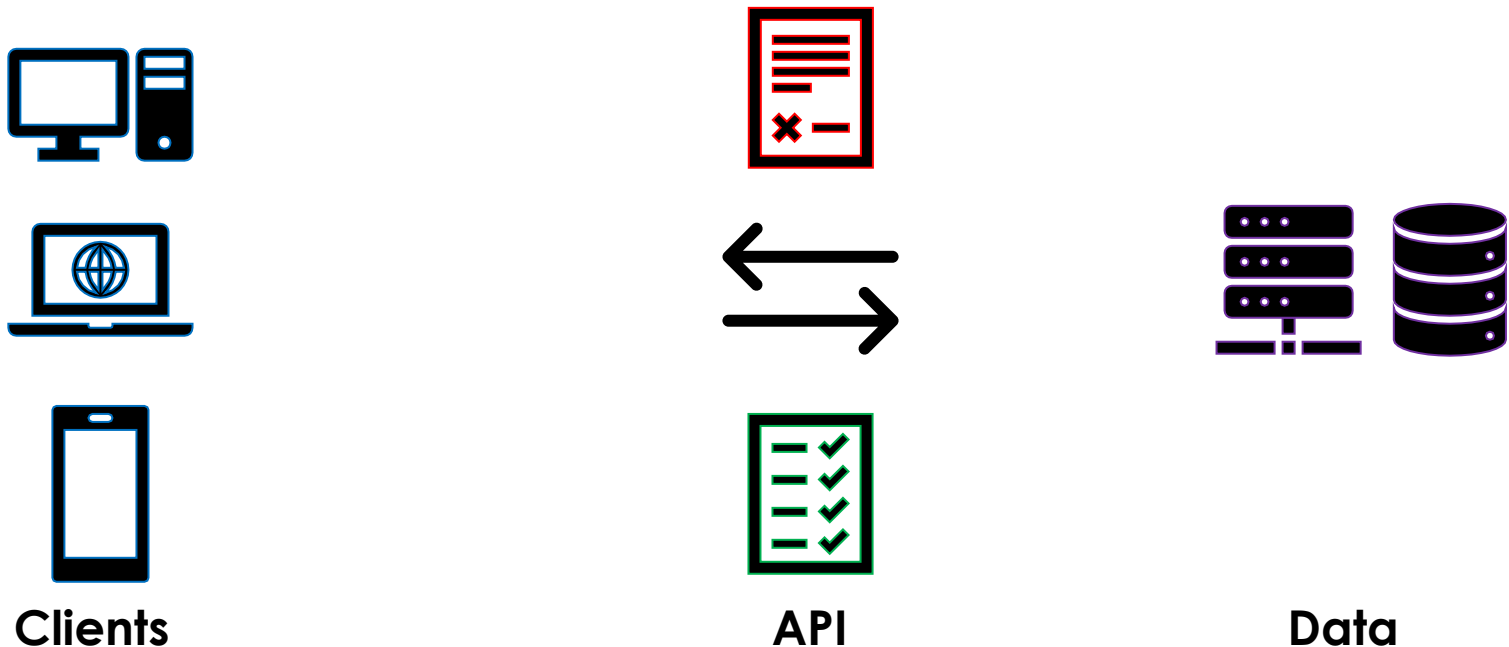
# APIs as outside sources

- Application Programming Interface
  - “This contract defines how the two communicate with each other using requests and responses.”



# APIs

- Requests must be made in the proper format
- Results we be returned in a predetermined format



# API Example

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- Requests and Responses are generally made over the internet.
- Programming languages will have tools for making requests over the internet.
  - <https://requests.readthedocs.io/en/latest/>
- Sometimes APIs will have their own libraries for that language
  - <https://boto3.amazonaws.com/v1/documentation/api/latest/index.html>

# API Example

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- Requests and Responses will have their own format.
- Requests are often in the form of an http query
- Results are often in a JSON format

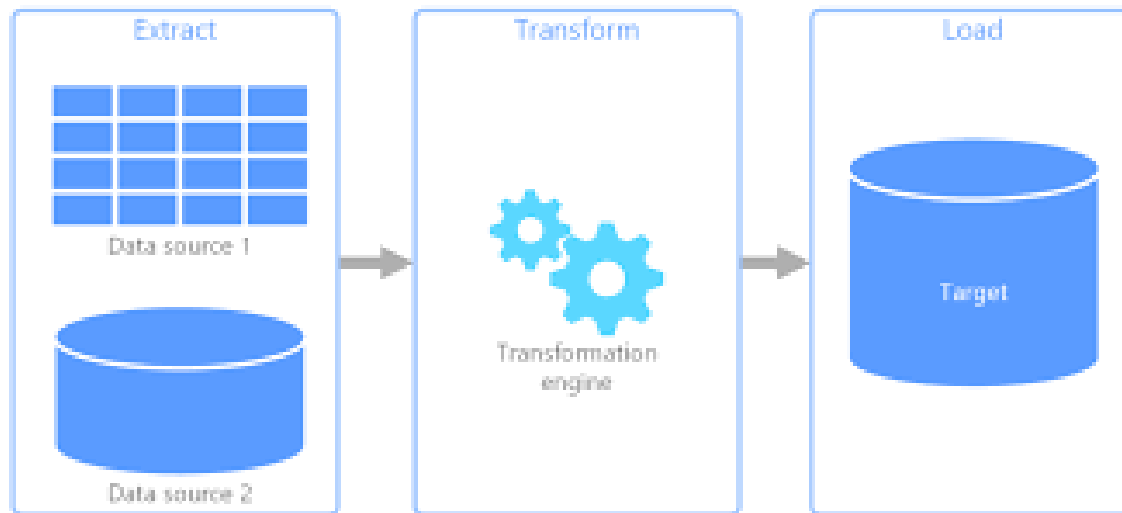
```
1 import urllib.request, json
2 url = "https://www.googleapis.com/pagespeedonline/v5/runPagespeed?url=https://https://www.bestcat.com/&strategy=desktop&locale=en&key=yourAPIKey"
3 response = urllib.request.urlopen(url)
4 data = json.loads(response.read())
```



# ETL Design Pattern

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- Extract data (from many sources)
- Transform (clean and standardize it)
- Load (insert it into database(s))



# Next Class

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Module:

Week 11: Databases in Software Systems

Topic:

**Connecting from our Application**

