Internet Programming
(32516)

- Lecturer: Dr. Yifei Dong
- The course outline and all lectures, notes, assignment details are available on Canvas.

About Me

- 10 years research experience
  - IoT
  - AI
- 10 years industry experience
  - Programmer
  - Architect
  - IT Director
- Interested in:
  - Web system development (React, Angular)
  - Mobile Programming (Ionic, Typescript)
  - Micro Service(Sprint boot, Spring Cloud)
  - DevOps(Jekins, Docker, Git)

Course Outline

- This subject will deal specifically with the World Wide Web development
- It gives you an insight into a set of programming techniques that can be used to build commercial websites. You will learn

  - What happens when you access a web page
  - How web pages can be produced by scripting languages and
  - This subject will enable you to design your own web applications.

Course Objectives

- Understand the general concepts in Internet and World Wide Web such as TCP/IP, protocols, domain names, IP addresses and n-tier architecture. In addition students will understand the roles of browsers, **(general level)**
- Possess an insight into what is involved in the developing and securing of non-trivial websites. **(general level)**
- Have a good working knowledge of DHTML, JavaScript, AJAX and the principles of website design. **(expert's level)**
- Have an insight into how javascript libraries such as DOM, JQuery can be used to enhance web pages. **(general level)**
- Have an introductory knowledge of how XML documents can be used on the Web. **(general level)**
- Gain experience in the use of PHP and OO PHP as a server side scripting language. **(expert's level)**
- Gain a sufficient knowledge of Unix so they can effectively manage websites hosted on sites running Unix Operating System. **(general level)**
- Gain introductory knowledge of website management and security. **(general level)**

Assessment

- Two assignments (45%, 35%)
- Two in-class quizzes (10%, 10%)

Teaching team

- Subject coordinator: Dr. Linchao Zhu (linchao.zhu@uts.edu.au)
- Tutors:
  - Dr. YiFei Dong
  - Dr. Ping Zhu
  - Dr. Md Sarwar Kamal
  - Dr. Xuan Zhang

What is the “Internet”?

- The Internet is a global computer network that provides a way for remote computers and local networks to communicate and share services and resources.

  This definition states what the Internet is, but not how it operates.

- From another viewpoint, the Internet can be seen as a set of Communication Protocols.

  This view of the Internet gives us an insight into how it operates.

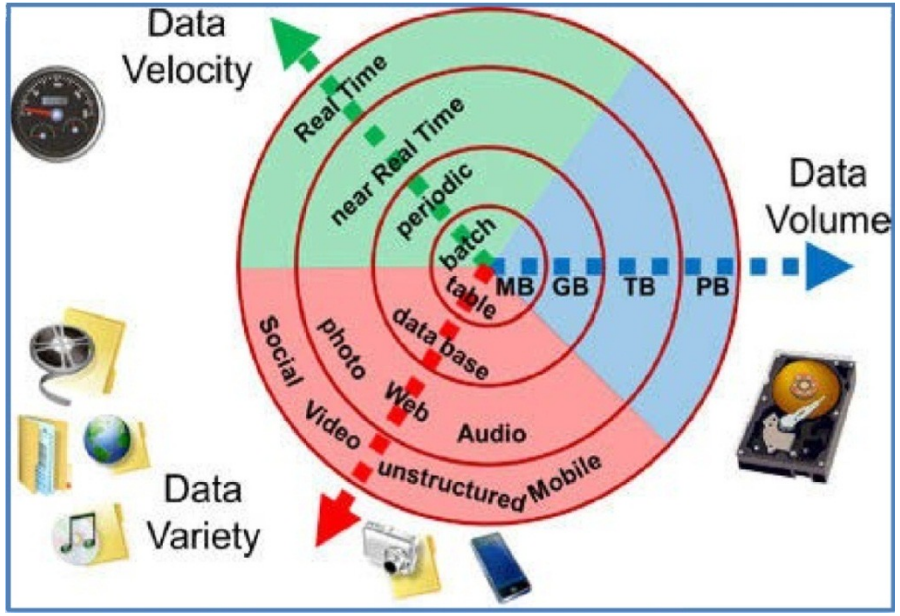
- A Protocol is a set of rules that govern data communication. A protocol defines what is to be communicated, how it is to be communicated and when it is to be communicated

Internet of Things (IoT) | The Next Big Thing

- IoT is growing rapidly. Millions, if not billions, of new devices will be connected worldwide in the coming years.
- The data characteristics in the IoT are more complex.
  - Websites, pictures, movies, audio and video streams, applications and much more. We are on the demand side, where we use browsers, smartphones, or music devices to download content from providers online. Many specialized application protocols are in use.
- Web Protocol for the IoT
  - CoAP vs HTTP
  - UDP vs IP/TCP

Internet of Things (IoT)

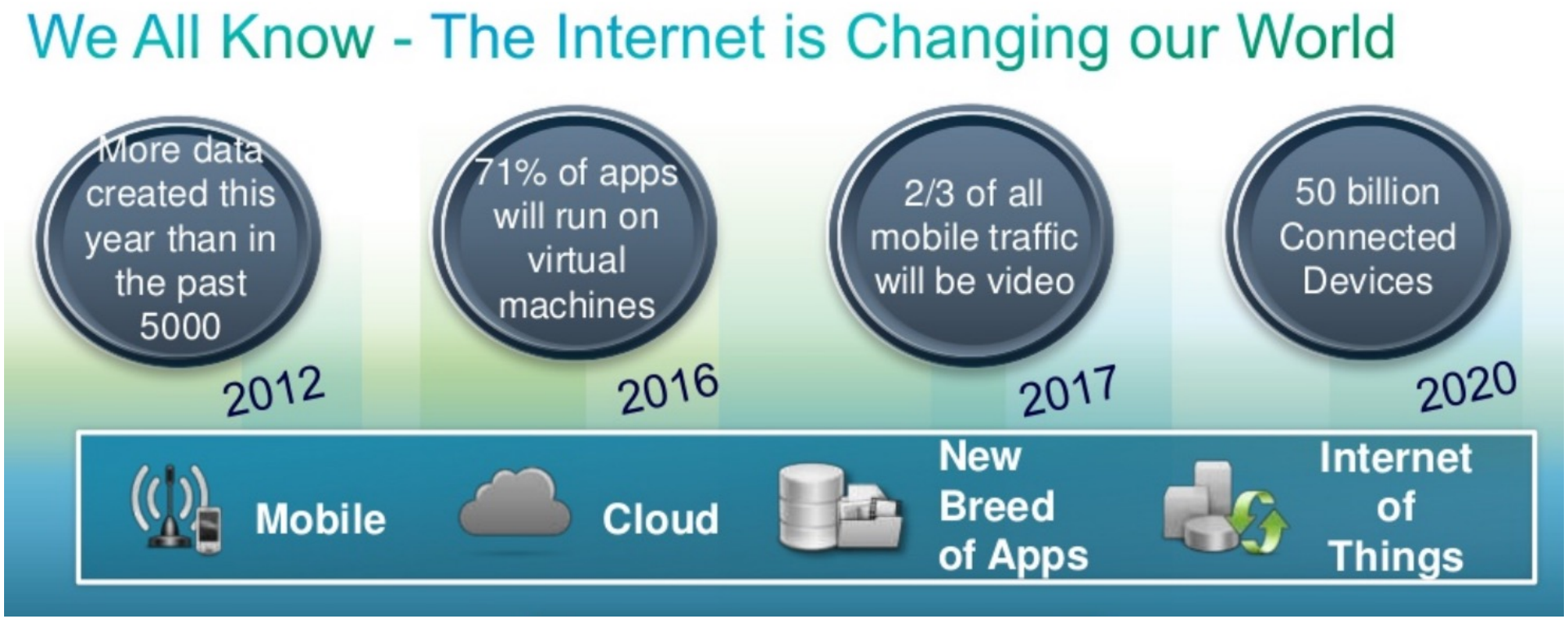
- IoT will rely on following technologies:
  - Big Data (volume, variety, velocity),
  - AI (algorithms, machine learning) + Cloud (resource sharing)
  - 5G (cellular mobile data communication),



There technologies are relied on or associated with Internet.

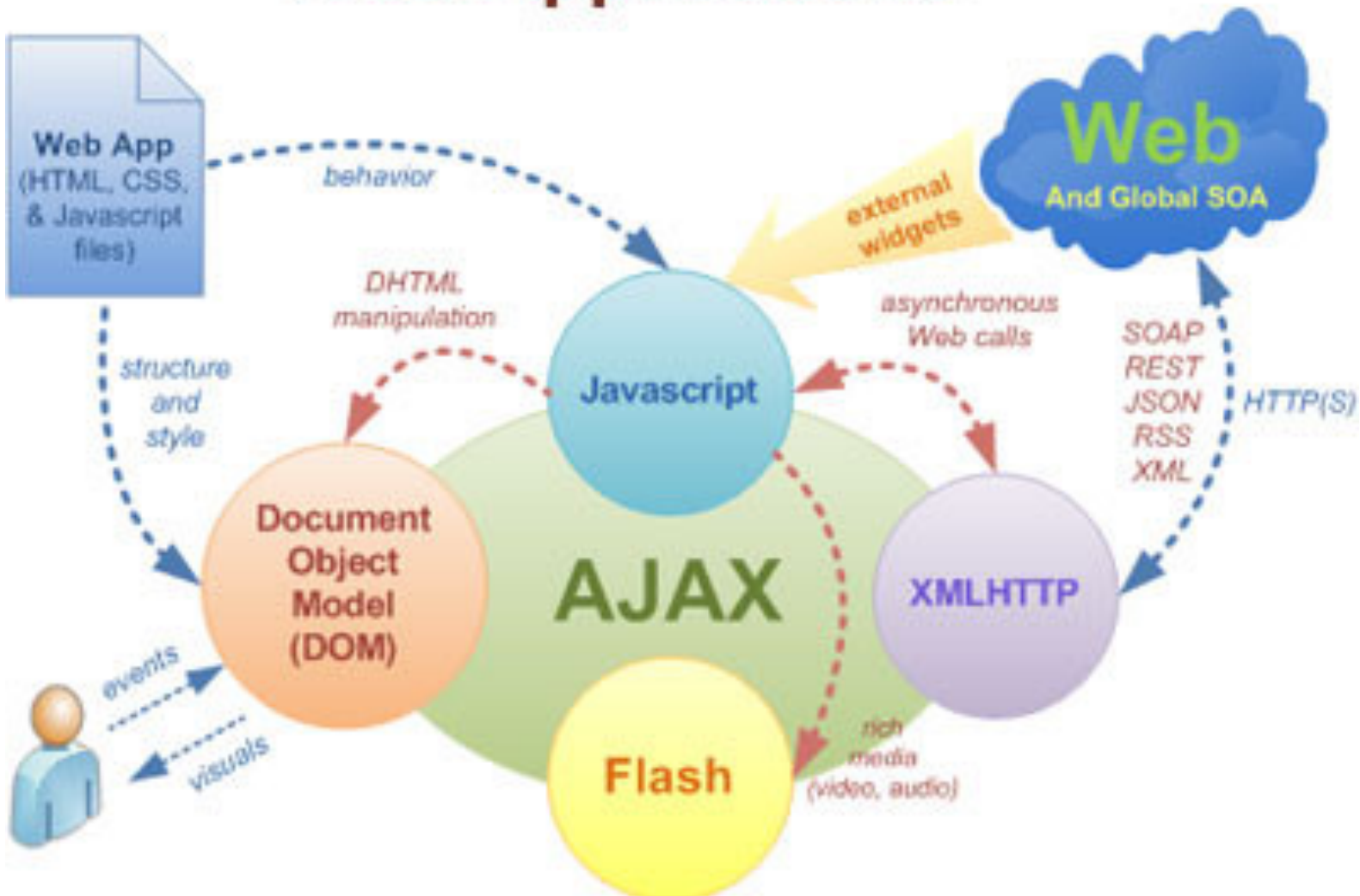
Cloud Computing

- Cloud computing is the on-demand delivery of compute power, database, storage, applications, and other IT resources.
- Cloud computing provides a simple way to access servers, storage, databases and a broad set of application services over the Internet.



Ubiquitous computing, Smart Home (City)? 5G mobile communication, driverless car, long distance robotic surgery, etc

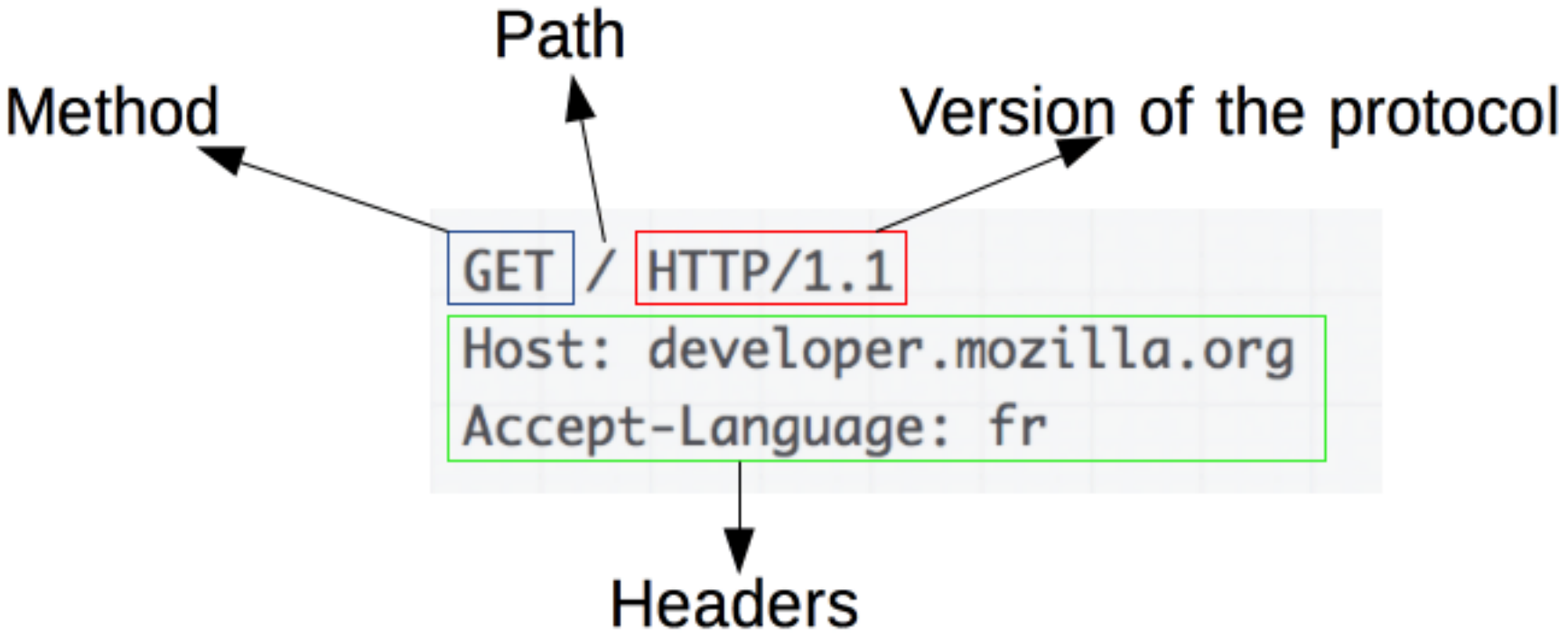
Web Applications



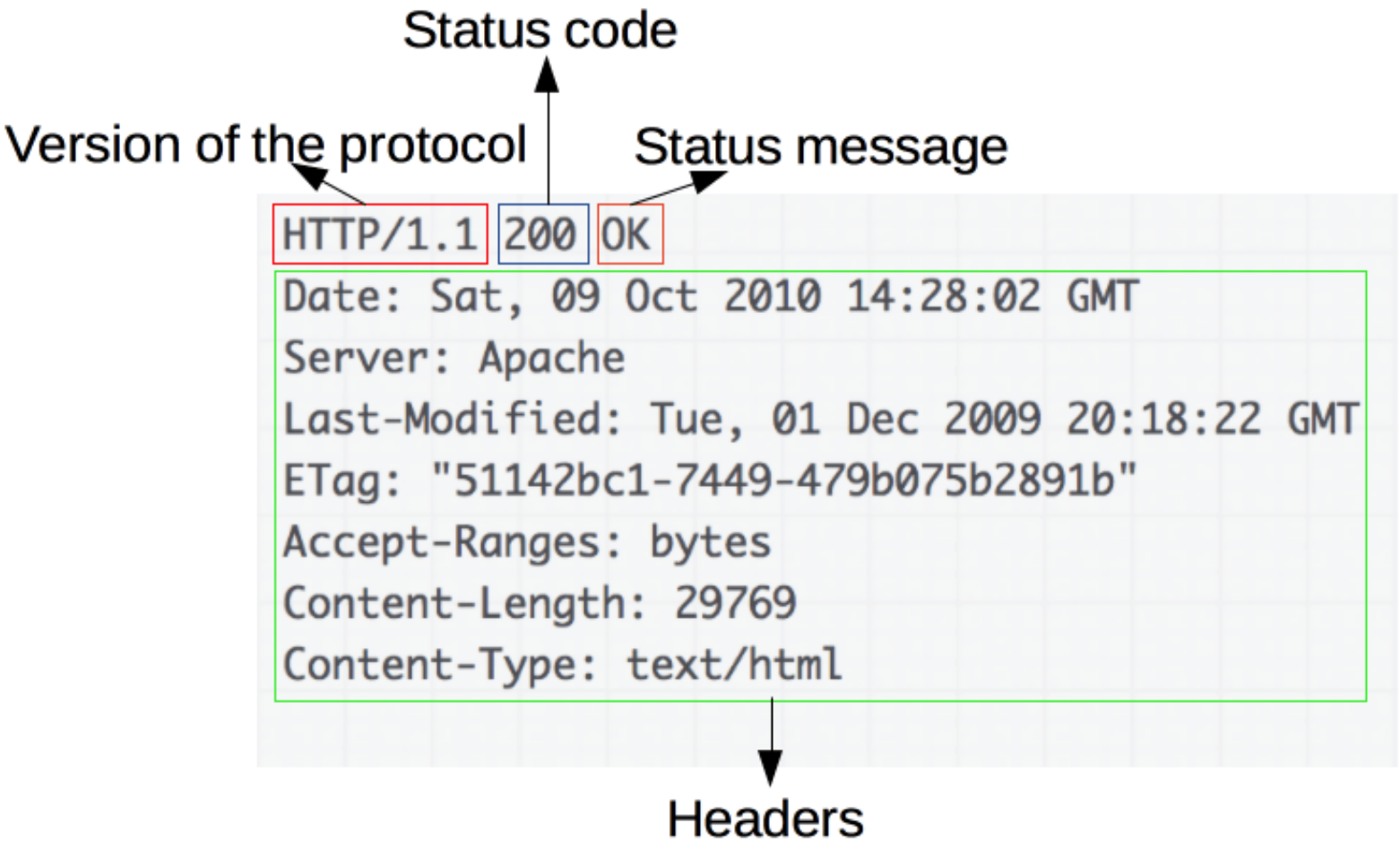
Traditional Internet Application Protocols

Protocol	Description
HTTP	Hypertext Transfer Protocol – used to retrieve web pages
SMTP	Simple Mail Transfer Protocol – used to send email
POP3	Post Office Protocol – used to retrieve email
IMAP	Internet Message Access Protocol, such as Gmail, Outlook.com and Yahoo! Mail
FTP	File Transfer Protocol. Used to send and retrieve files.
Telnet	Used to login to a remote machine for remote administration of Unix computers

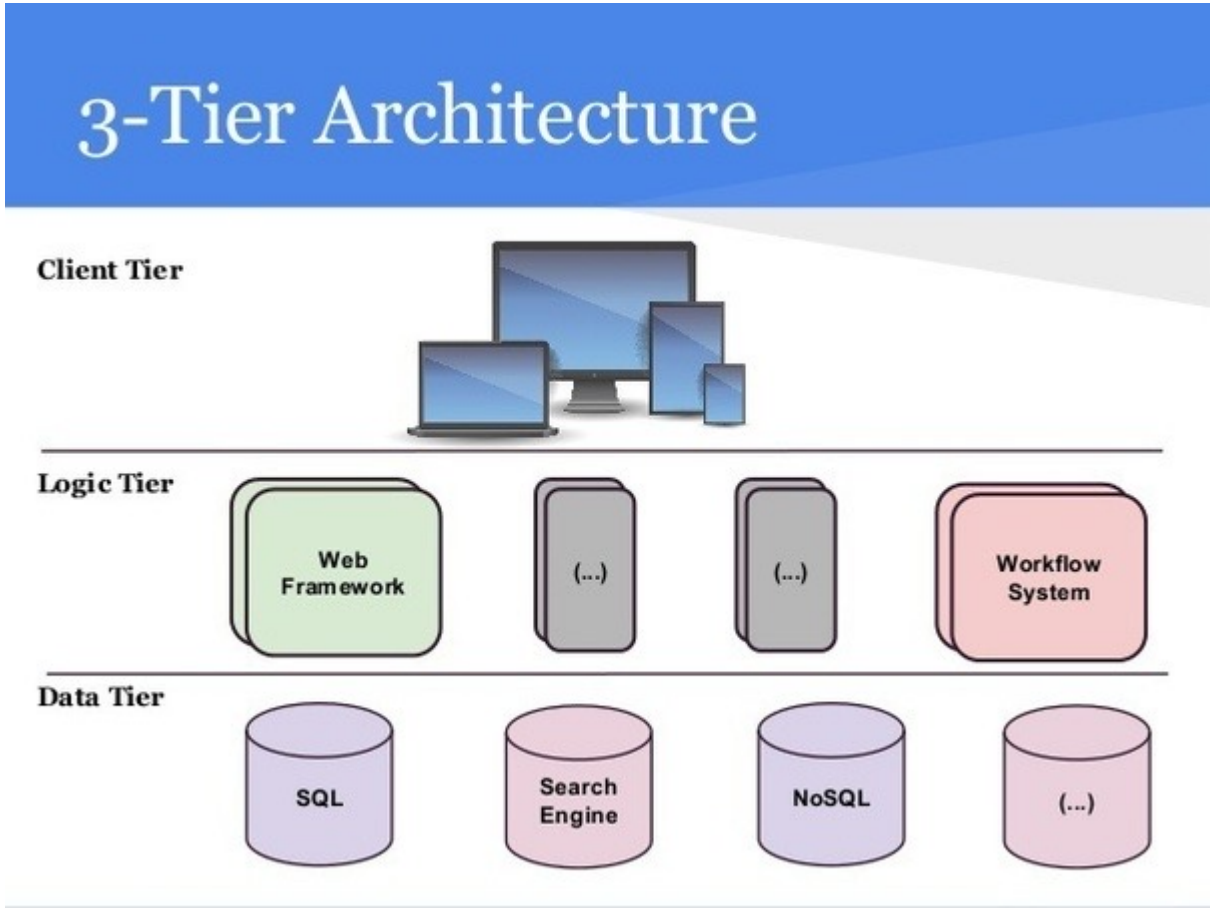
An example HTTP request:



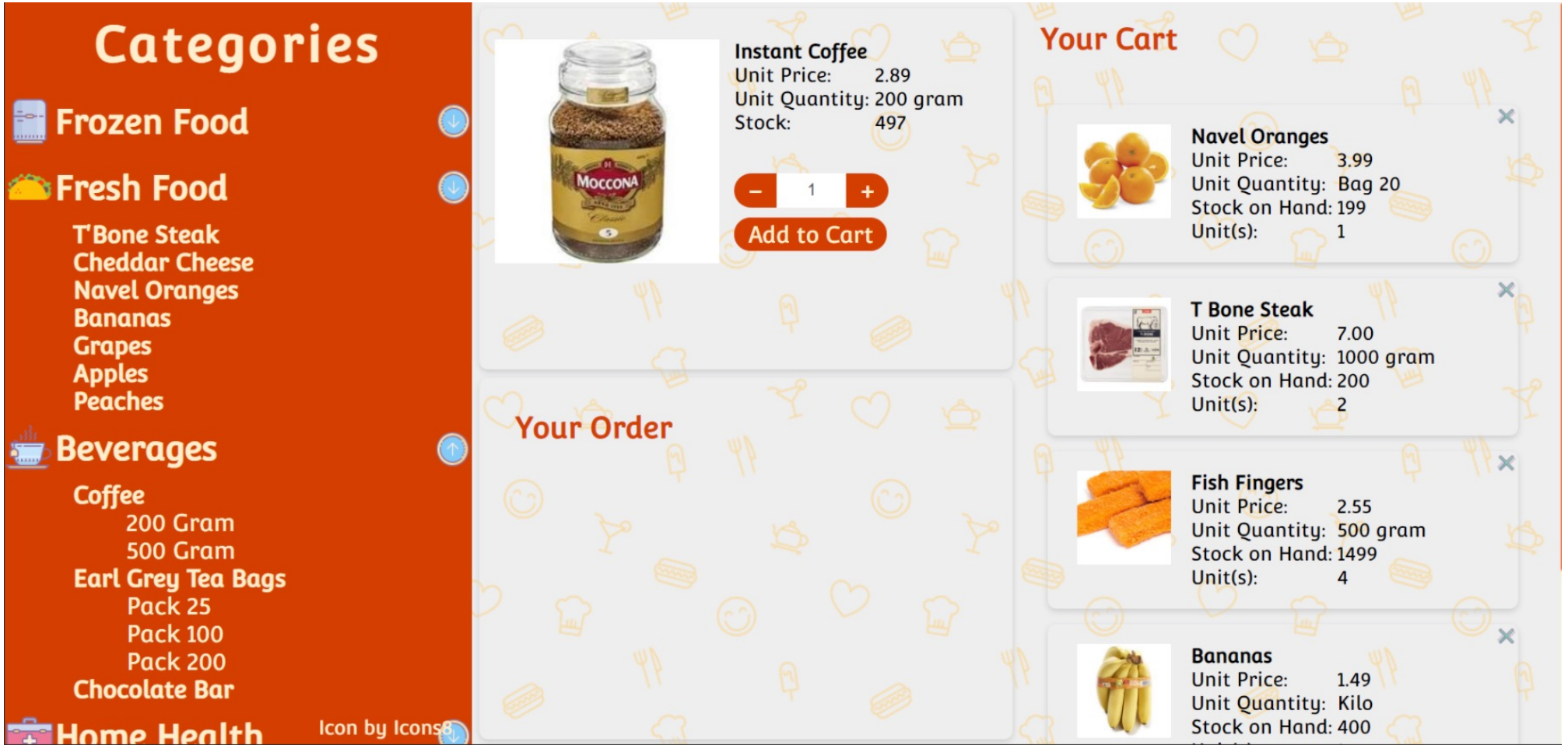
An example HTTP response :



Three-Tier Web Applications



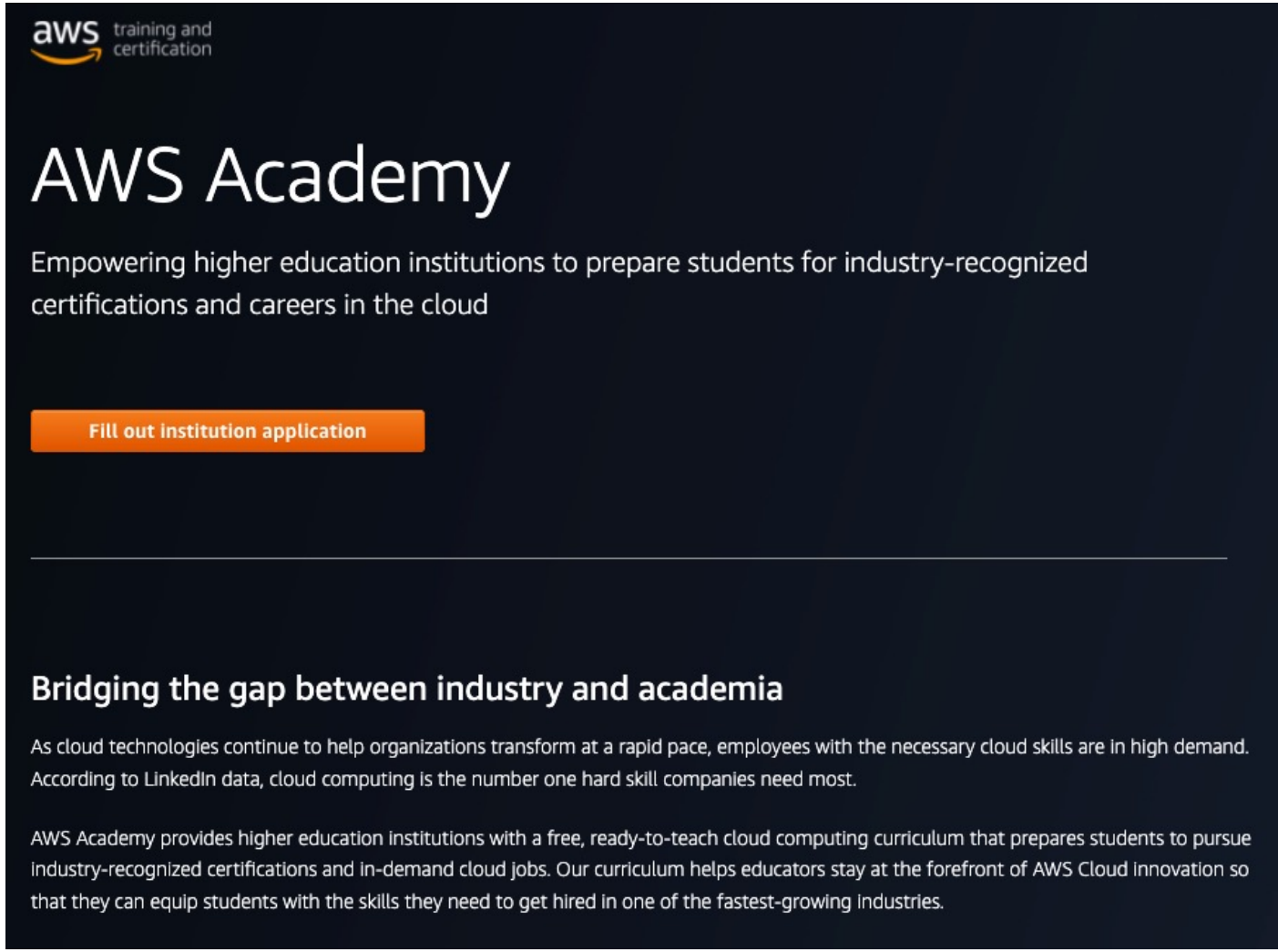
Assignment 1: An On-line Grocery Store with Graphic User Interface



Assignment 2: An Online Car Rental System using AJAX and JSON

Lab and Assignment

- We will use AWS Cloud services
- We will use AWS Academy in our lab and in the assignment
  - https://aws.amazon.com/training/awsacademy/
- You will deploy your website to AWS so that everyone can access it.



Lab and Assignment

- You have been invited to join AWS Academy Cloud Foundations [15150]
- Please finish the registration process and review the following videos in Module 1
  - Section 1 Video - Introduction to cloud computing
  - Section 2 Video - Advantages of the Cloud
  - Section 3 Video - Introduction to AWS
- If you don’t receive the invitation, please reach out to Linchao.Zhu@uts.edu.au

Please also review the videos on CANVAS

- 3 Tier Online e-Commerce Architecture
- Object Oriented Programming Concepts
- Web Interface Design
- 5G Mobile Communications
- Internet of Things (IoT)
- Smart Cities
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Questions?