

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.

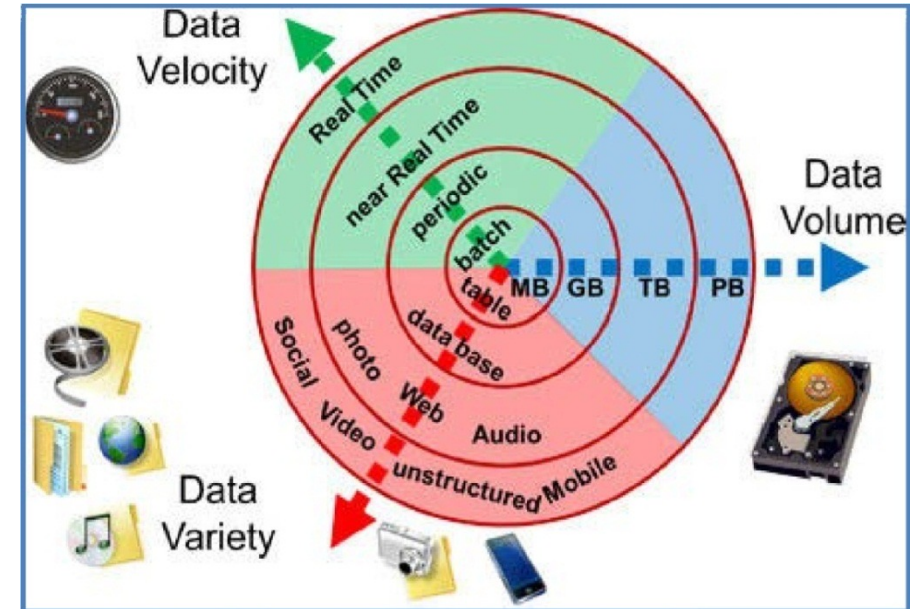
- A Protocol is a set of rules that govern data communication. A protocol defines what is to be communicated, how it is to be communicated and when it is to be communicated

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),



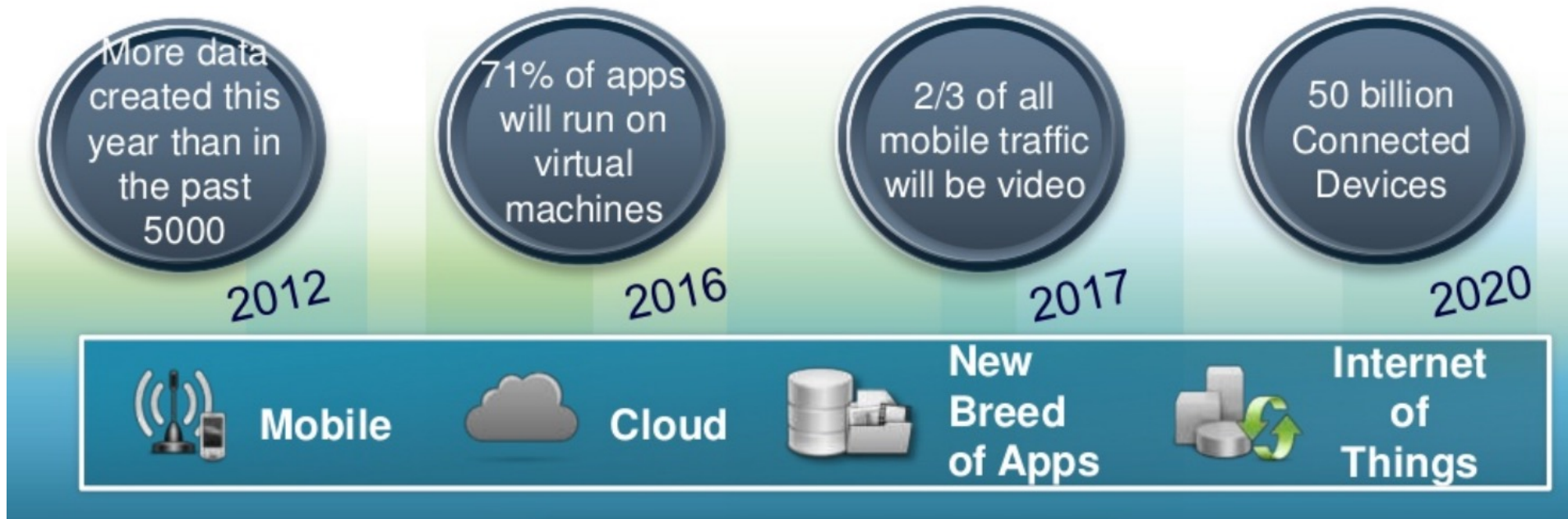
There technologies are relied on or associated with **Internet**.

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.

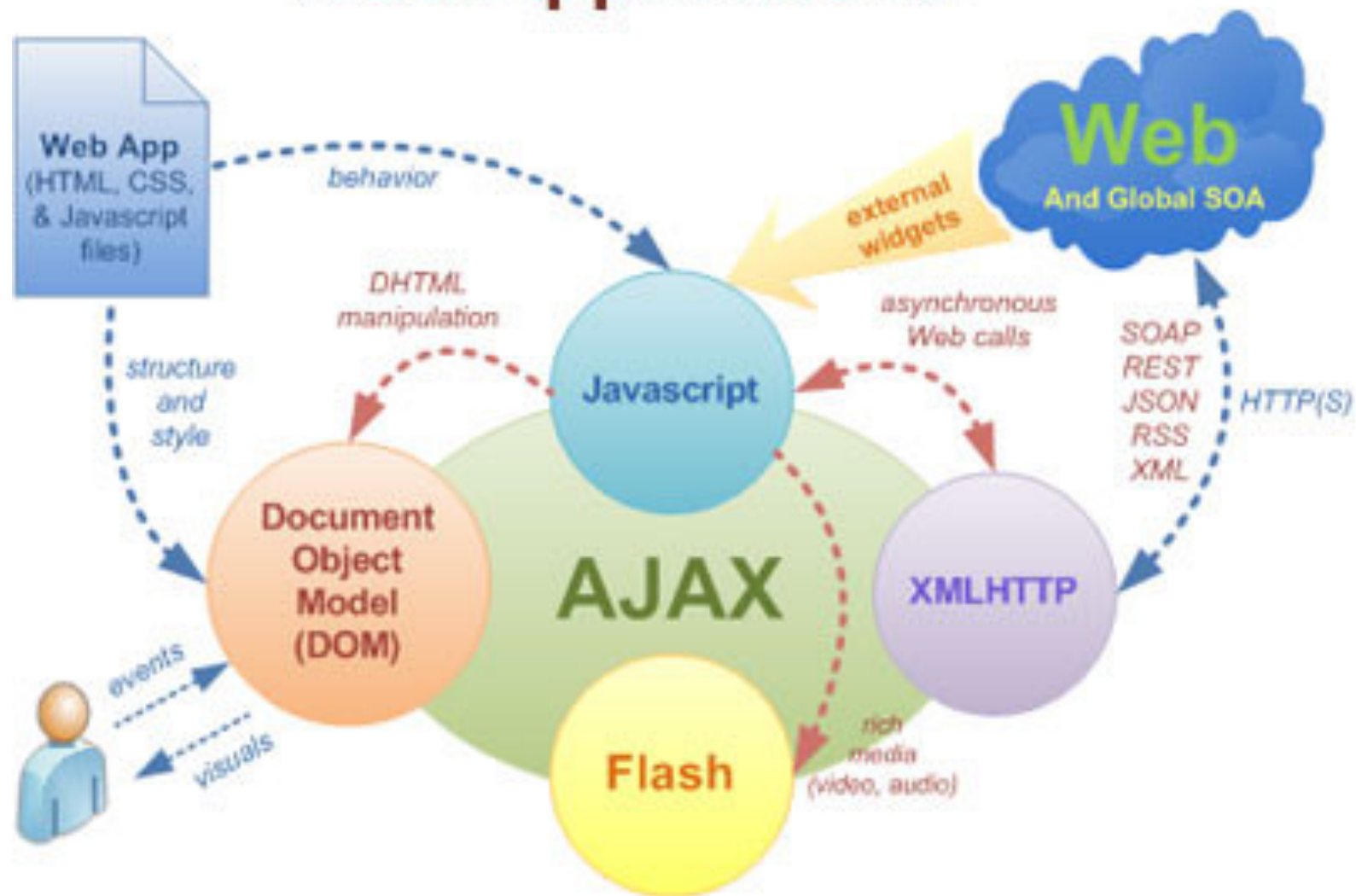


We All Know - The Internet is Changing our World



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

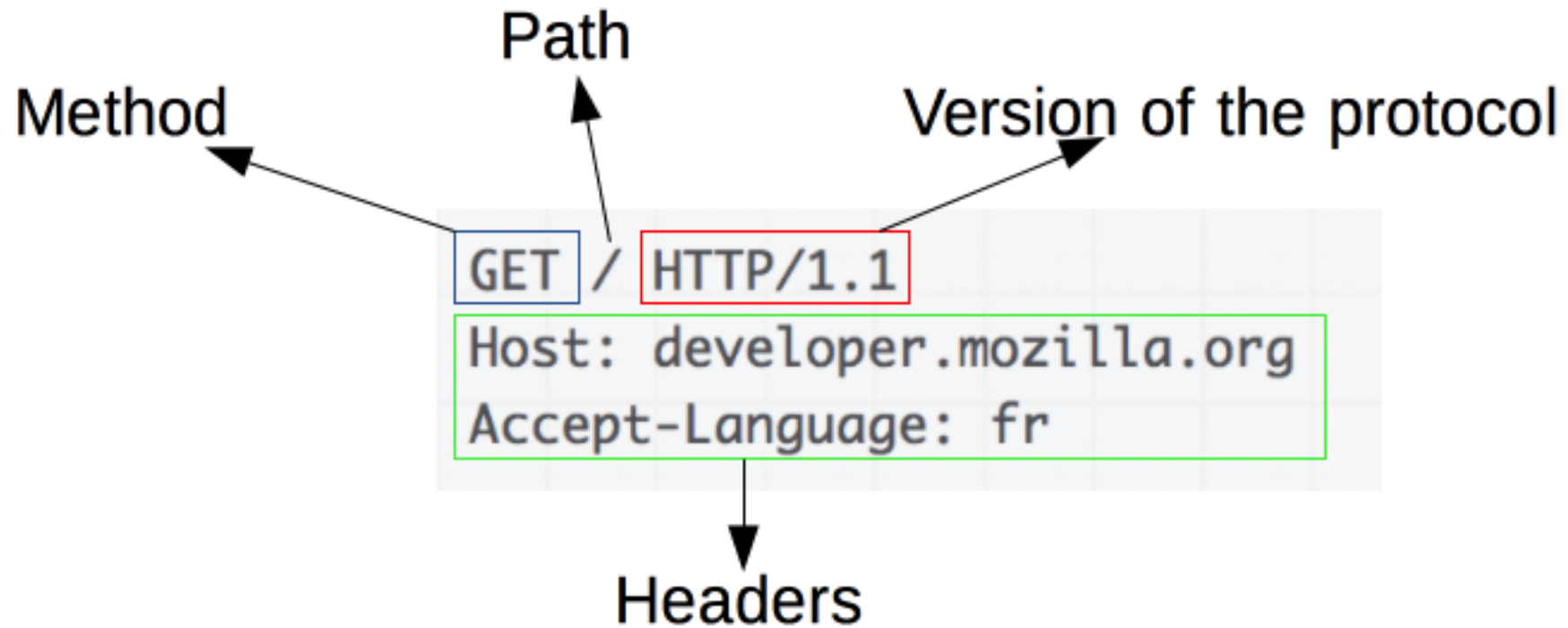
Web Applications



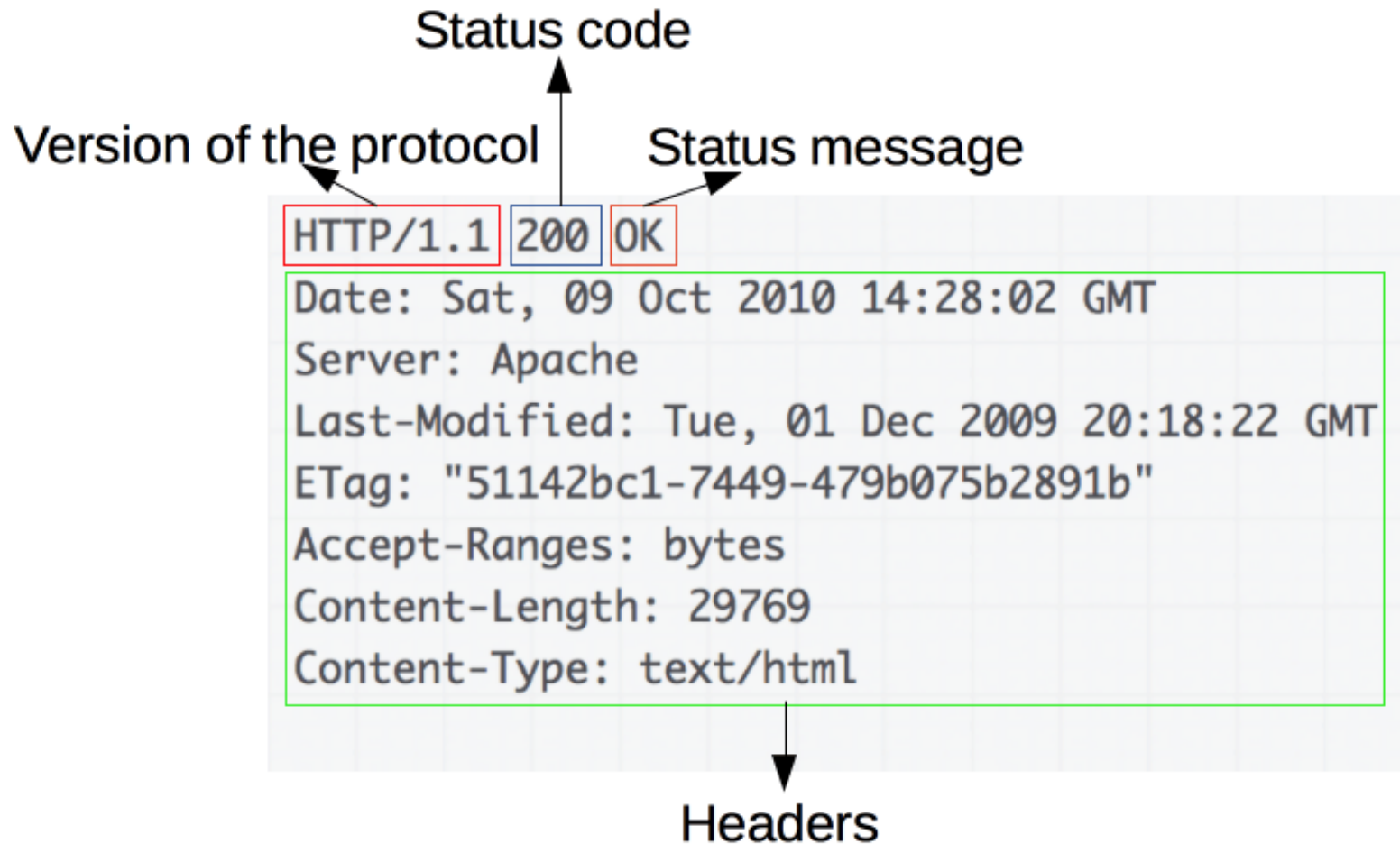
Traditional Internet Application Protocols

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

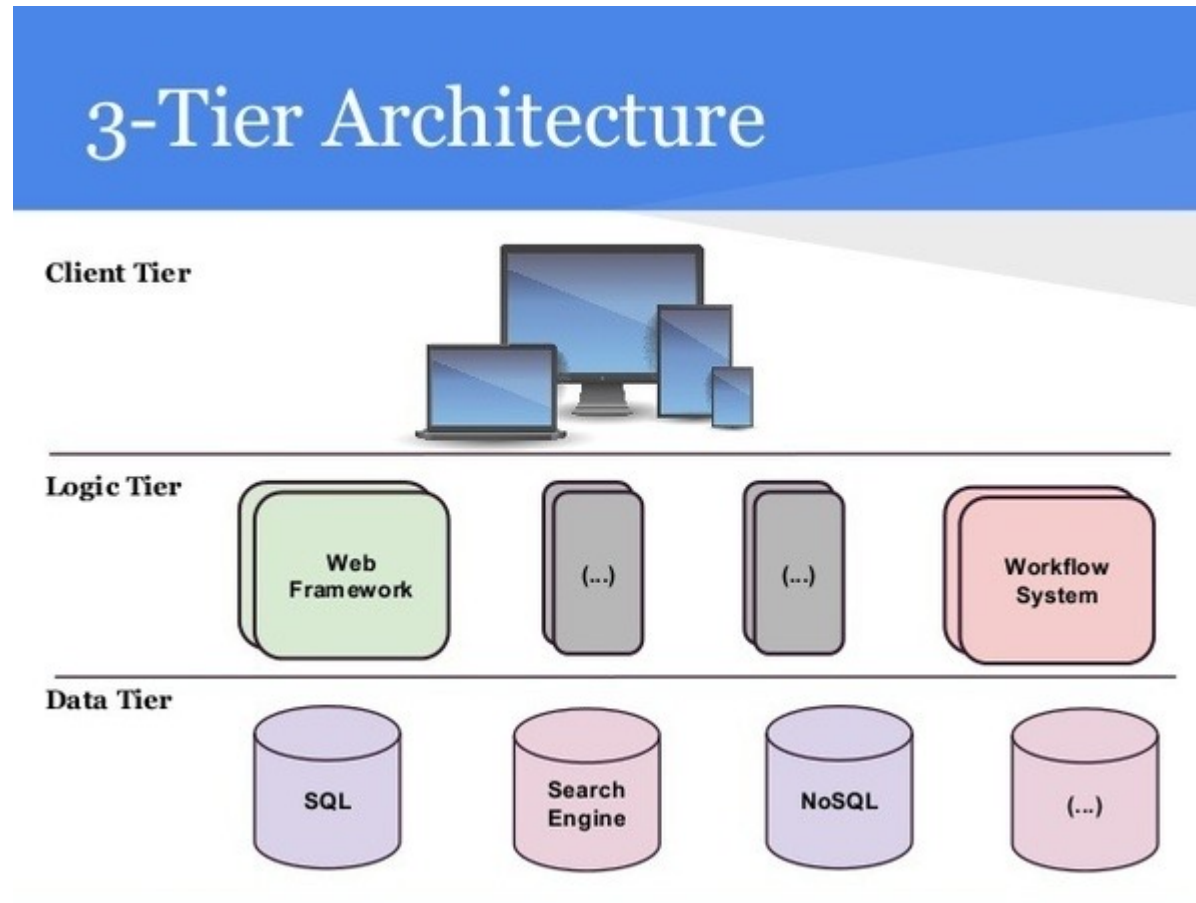
An example HTTP request:



An example HTTP response :








Three-Tier Web Applications



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

Categories

-  **Frozen Food**
-  **Fresh Food**
 - T Bone Steak
 - Cheddar Cheese
 - Navel Oranges
 - Bananas
 - Grapes
 - Apples
 - Peaches
-  **Beverages**
 - Coffee
 - 200 Gram
 - 500 Gram
 - Earl Grey Tea Bags
 - Pack 25
 - Pack 100
 - Pack 200
 - Chocolate Bar
-  **Home Health**





Instant Coffee
Unit Price: 2.89
Unit Quantity: 200 gram
Stock: 497


- 1 +


Add to Cart

Your Cart

- 

Navel Oranges
Unit Price: 3.99
Unit Quantity: Bag 20
Stock on Hand: 199
Unit(s): 1
- 

T Bone Steak
Unit Price: 7.00
Unit Quantity: 1000 gram
Stock on Hand: 200
Unit(s): 2
- 

Fish Fingers
Unit Price: 2.55
Unit Quantity: 500 gram
Stock on Hand: 1499
Unit(s): 4
- 


Bananas
Unit Price: 1.49
Unit Quantity: Kilo
Stock on Hand: 400

Your Order

Icon by Icons8

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

Hertz-UTS



Chevrolet Captiva 2012


Fuel Type	Mileage (kms)	Seats
Petro	85364	7

The Chevrolet Captiva is a compact crossover SUV developed by General Motors. The first gene...

\$120 / day

Availability
True

ADD TO CART



Toyota Camry 2013

Fuel Type	Mileage (kms)	Seats
Petro	85364	5

Toyota Camry is an AWD car. The only major component that is shared with the ...

\$125 / day

Availability
False

NOT AVAILABLE



Chevrolet Captiva 2012

Fuel Type	Mileage (kms)	Seats
Petro	85364	7

The Chevrolet Captiva is a compact crossover SUV developed by General Motors. The first gene...

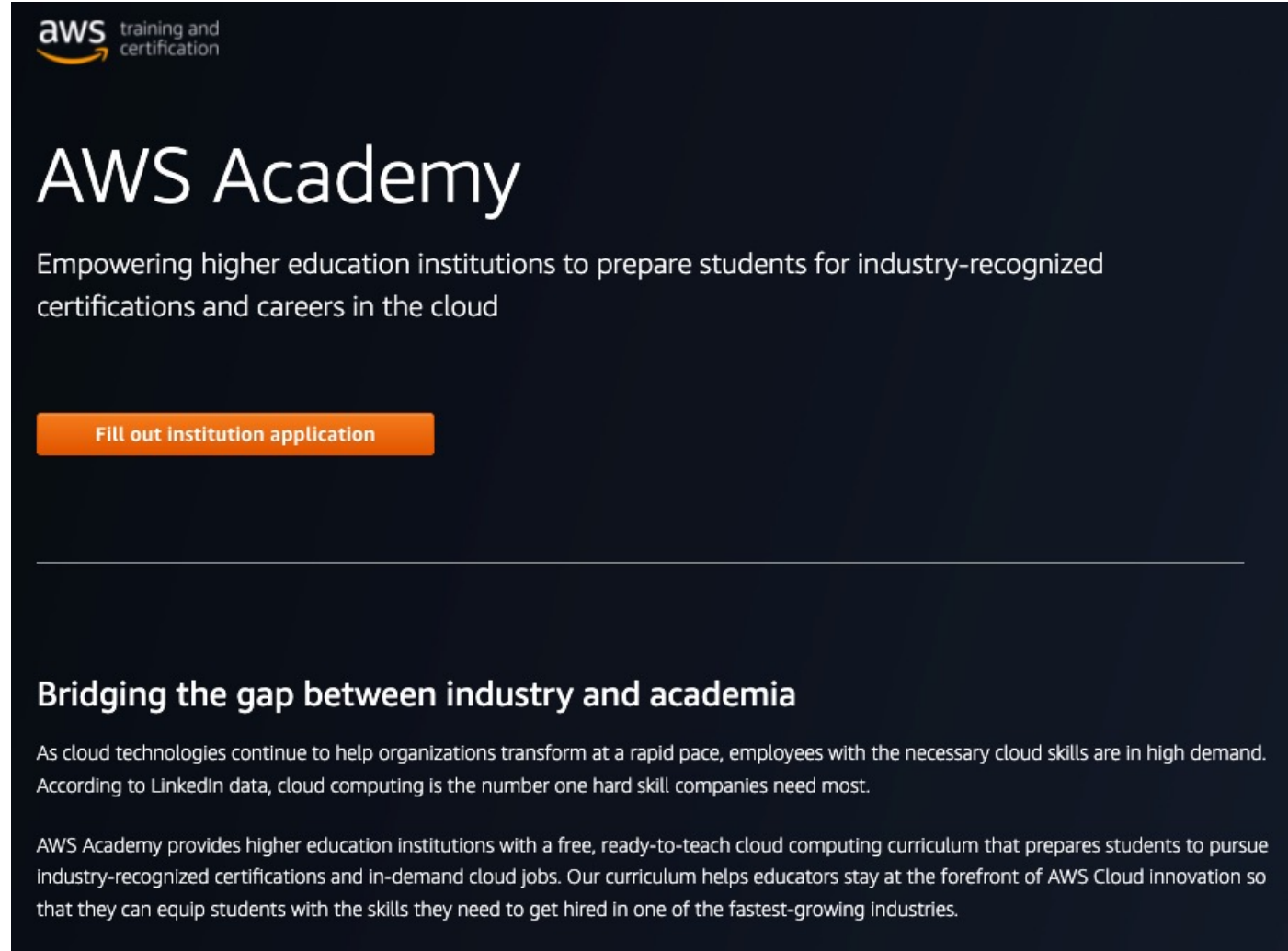
\$120 / day

Availability
True

ADD TO CART

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.



The screenshot shows the AWS Academy website. At the top left is the AWS logo with the text "aws training and certification". The main heading is "AWS Academy" in large white font. Below it is a subtitle: "Empowering higher education institutions to prepare students for industry-recognized certifications and careers in the cloud". A prominent orange button with white text says "Fill out institution application". Below this is a horizontal line. Further down, the heading "Bridging the gap between industry and academia" is followed by two paragraphs of text. The first paragraph states that cloud technologies are transforming organizations rapidly, and cloud computing is the top hard skill needed according to LinkedIn data. The second paragraph describes AWS Academy's free curriculum for higher education, which prepares students for industry-recognized certifications and in-demand cloud jobs.

aws training and certification

AWS Academy

Empowering higher education institutions to prepare students for industry-recognized certifications and careers in the cloud

[Fill out institution application](#)

Bridging the gap between industry and academia

As cloud technologies continue to help organizations transform at a rapid pace, employees with the necessary cloud skills are in high demand. According to LinkedIn data, cloud computing is the number one hard skill companies need most.

AWS Academy provides higher education institutions with a free, ready-to-teach cloud computing curriculum that prepares students to pursue industry-recognized certifications and in-demand cloud jobs. Our curriculum helps educators stay at the forefront of AWS Cloud innovation so that they can equip students with the skills they need to get hired in one of the fastest-growing industries.

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
-

Questions?