



# Flask



講者：Isaac

# Outline

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- ▶ HTML introduction
- ▶ Flask



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# HTML Introduction



# Common browsers

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# What human see on a webpage

[網站導覽](#) | [新生](#) | [在校學生](#) | [國際生](#) | [教職員](#) | [訪客](#) | [校友](#)

聯絡我們 站內搜尋:  [English](#)

[學術庫](#) | [圖書館](#) | [博物館群](#) | [課程](#) | [招生](#) | [推廣教育](#) | [行事曆](#) | [捐款](#)

 **國立臺灣大學**  
National Taiwan University

[認識臺大](#) | [學術單位](#) | [研究發展](#) | [行政組織](#) | [常見詢問](#) | [服務資源](#)



[學術單位](#) [二首頁 > 學術單位](#)

[學術單位一覽表](#)

[文學院](#)

[理學院](#)

[社會科學院](#)

[醫學院](#)

### 學術單位

臺大現有11個學院、54個學系、103個研究所、6個碩博士學位學程，橫跨自然科學與人文社會藝術領域，每學期所開課程數達8,000班以上，無論所擁有的學術領域或開設之課程數，在全國大學中均無出其右者，學生就讀於臺大，無疑是進入最為豐富的知識寶庫，可獲得最多元而優質的學習機會。



**文學院**  
設院時間：1945年  
電話：(02)33663988

[TOP](#)

# What human see on a webpage

The screenshot displays the NTU website at [www.ntu.edu.tw/academics/academics.html](http://www.ntu.edu.tw/academics/academics.html). The page features a navigation bar with links for '網站導覽', '新生', '在校學生', '國際生', '教職員', '訪客', and '校友'. A search bar is also present. The main content area is titled '學術單位' (Academic Units) and lists various departments. A context menu is open, showing options like '另存新檔', '將頁面儲存至 Pocket', and '檢視頁面資訊' (highlighted with a red box). The '檢視頁面資訊' option is selected, indicating that the user is inspecting the page's metadata or source code.

網站導覽 | 新生 | 在校學生 | 國際生 | 教職員 | 訪客 | 校友

學術單位 | 圖書館 | 博物館群 | 課程 | 招生 | 推廣教育 | 行事曆 | 捐款

認識臺大 學術單位 研究發展 行政組織 常見詢問 服務資源

學術單位

學術單位一覽表

- 文學院
- 理學院
- 社會科學院
- 醫學院
- 工學院
- 生物資源暨農學院
- 管理學院
- 公共衛生學院
- 環境資訊學院

學術單位

臺大現有11個學院、54個學系、103個研究所、6個碩博士學位學程，橫跨自然科學與人文社會科學，每學期所開課程數達8,000班以上，無論所擁有的學術領域或開設之課程數，在全國大學中名列前茅。學生就讀於臺大，無疑是進入最為豐富的知識寶庫，可獲得最多元而優質的學習機會。

文學院

設院時間：1928年  
電話：(02)33663988  
傳真：(02)23638818  
網址：<http://liberal.ntu.edu.tw/>  
電子信箱：[liberal@ntu.edu.tw](mailto:liberal@ntu.edu.tw)

理學院

設院時間：1928年  
電話：(02)33664188

# What computer see on a webpage

```
<title>學術單位 - 國立臺灣大學</title>
</head>
<body>
<header data-collapse="off" id="Mheader">
  <noscript>
    <div id="topbar">
      <div class="container">
        <div id="student">
          <ul>
            <div class="accesskey"><a accesskey="U" title="上方導覽連結區" href="#">:::</a></div>
            <li><a href="../sitemap.html" title="網站導覽">網站導覽</a></li>
            <li><a href="http://reg.aca.ntu.edu.tw/newstu" target="_blank" title="新生(另開視窗)">新生</a></li>
            <li><a href="https://my.ntu.edu.tw/?block=5,6" target="_blank" title="在校學生(另開視窗)">在校學生</a></li>
            <li><a href="http://www.oia.ntu.edu.tw" target="_blank" title="國際生(另開視窗)">國際生</a></li>
            <li><a href="https://my.ntu.edu.tw/?block=1,2,4" target="_blank" title="教職員(另開視窗)">教職員</a></li>
            <li><a href="http://visitorcenter.cloud.ntu.edu.tw/" target="_blank" title="訪客(另開視窗)">訪客</a></li>
            <li><a href="http://homepage.ntu.edu.tw/~ntualumni/" target="_blank" title="校友(另開視窗)">校友</a></li>
          </ul>
        </div>
        <div id="search">
          <ul>
            <li><a href="http://www.ntu.edu.tw/oldchinese/" target="_blank" title="回舊站(另開視窗)">回舊站</a></li>
            <li><a href="../contact.html" title="聯絡我們">聯絡我們</a></li>
            <li><li>站內搜尋</li>-->
              <form action="http://www.google.com/cse" id="cse-search-box" style="width: 200px;">
                <label for="keyword">站內搜尋 :</label>
                <input type="hidden" name="cx" value="011987122760880416627:zsghqazzvk4">
                <input type="hidden" name="ie" value="utf-8">
                <input id="searchInput" type="text" value="請輸入關鍵字" onkeypress="if(this.value=='請輸入關鍵字'){this.style.color='';this.value='';}" onclick="if(this.value=='請輸入關鍵字'){this.style.color='';this.value='';}" onblur="if(!this.value.length){this.style.color='#999999';this.value='請輸入關鍵字';}" maxlength="2048" name="q">
                <input type="image" alt="開始搜尋" title="開始搜尋" src="../images/search.png" name="go" class="searchBtn">
                <input type="hidden" value="www.google.com/cse/home?cx=011987122760880416627:zsghqazzvk4" name="siteurl">
                <input type="hidden" value="www.google.com/cse/panel/basics?cx=011987122760880416627:zsghqazzvk4&sig=__oJ8F1PpI1CTk40CeWf1D1J4PyGE=" name="ref">
              </form>
            </li>
          </ul>
        </div>
        <div id="webType">
          <ul>
            <li class="mobileWebType2"><a id="EngLink" href="../english/academics/academics.html" title="English">English</a></li>
          </ul>
        </div>
      </div>
    </noscript>
  </header>
```

# What computer see on a webpage

```
<title>學術單位 - 國立臺灣大學</title>
</head>
<body>
<header data-collapse="off" id="Mheader">
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            <div class="accesskey"><a accesskey="U" title="上方導覽連結區" href="#">:::</a></div>
            <li><a href="../sitemap.html" title="網站導覽">網站導覽</a></li>
            <li><a href="http://reg.aca.ntu.edu.tw/newstu" target="_blank" title="新生(另開視窗)">新生</a></li>
            <li><a href="https://my.ntu.edu.tw/?block=5,6" target="_blank" title="在校學生(另開視窗)">在校學生</a></li>
            <li><a href="http://www.oia.ntu.edu.tw" target="_blank" title="國際生(另開視窗)">國際生</a></li>
            <li><a href="https://my.ntu.edu.tw/?block=1,2,4" target="_blank" title="教職員(另開視窗)">教職員</a></li>
            <li><a href="http://visitorcenter.cloud.ntu.edu.tw/" target="_blank" title="訪客(另開視窗)">訪客</a></li>
            <li><a href="http://homepage.ntu.edu.tw/~ntualumni/" target="_blank" title="校友(另開視窗)">校友</a></li>
          </ul>
        </div>
        <div id="search">
          <ul>
            <li><a href="http://www.ntu.edu.tw/oldchinese/" target="_blank" title="回舊站(另開視窗)">回舊站</a></li>
            <li><a href="../contact.html" title="聯絡我們">聯絡我們</a></li>
            <!--<li>站內搜尋</li>-->
            <li>
              <form action="http://www.google.com/cse" id="cse-search-box" style="width: 200px;">
                <label for="keyword">站內搜尋</label>
                <input type="hidden" name="cx" value="011987122760880416627:zsghqazzvk4">
                <input type="hidden" name="ie" value="utf-8">
                <input id="searchInput" type="text" value="請輸入關鍵字" onkeypress="if(this.value=='請輸入關鍵字'){this.style.color='';this.value='';}" onclick="if(this.value=='請輸入關鍵字'){this.style.color='';this.value='';}" onblur="if(!this.value.length){this.style.color='#999999';this.value='請輸入關鍵字';}" maxlength="2048" name="q">
                <input type="image" alt="開始搜尋" title="開始搜尋" src="../images/search.png" name="go" class="searchBtn">
                <input type="hidden" value="www.google.com/cse/home?cx=011987122760880416627:zsghqazzvk4" name="siteurl">
                <input type="hidden" value="www.google.com/cse/panel/basics?cx=011987122760880416627:zsghqazzvk4&sig=__oj8F1PpI1CTk40CeWf1D1J4PyGE=" name="ref">
              </form>
            </li>
          </ul>
        </div>
      </div>
    </div>
    <div id="webType">
      <ul>
        <li class="mobileWebType2"><a id="EngLink" href="../english/academics/academics.html" title="English">English</a></li>
      </ul>
    </div>
```



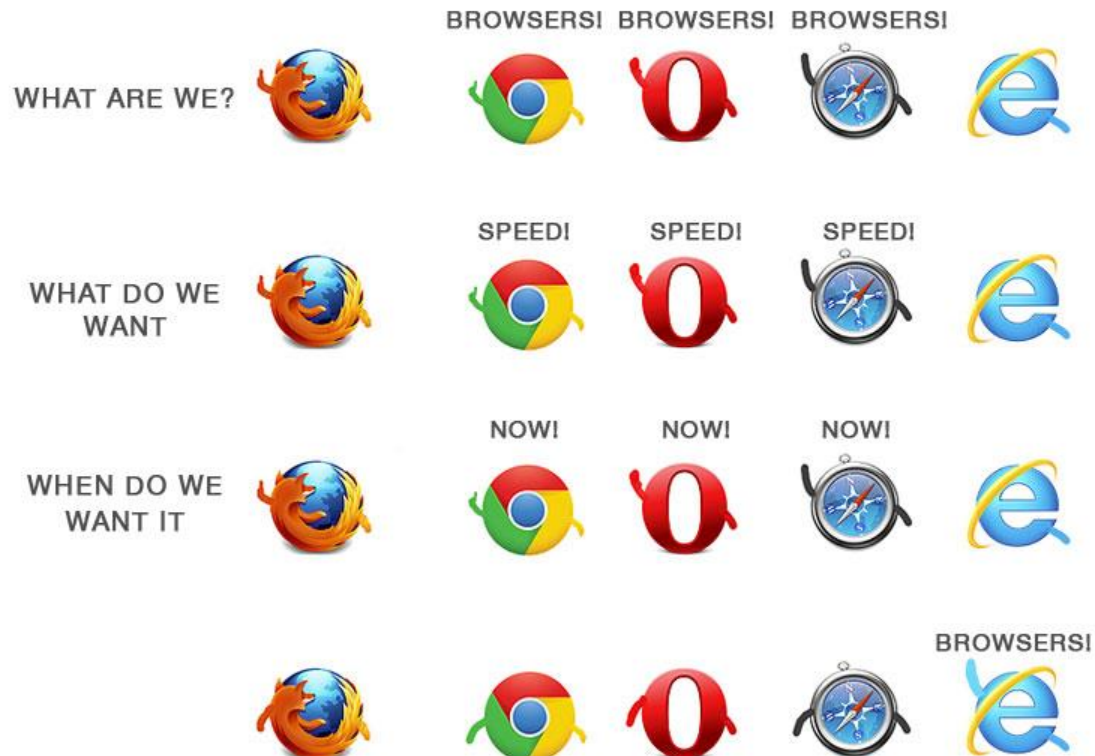


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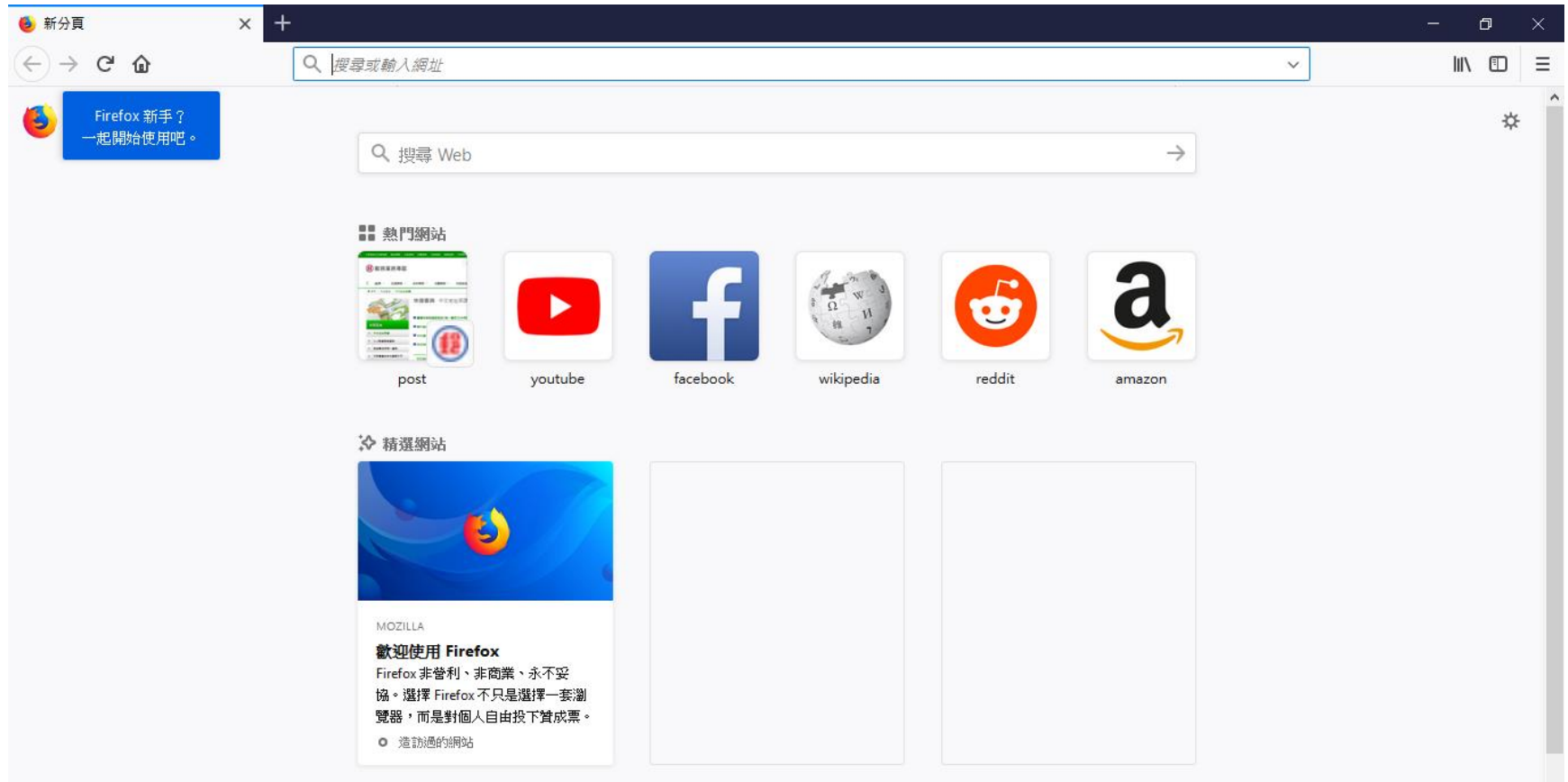
**This is why we need to know HTML code.....**

# A Joke on IE

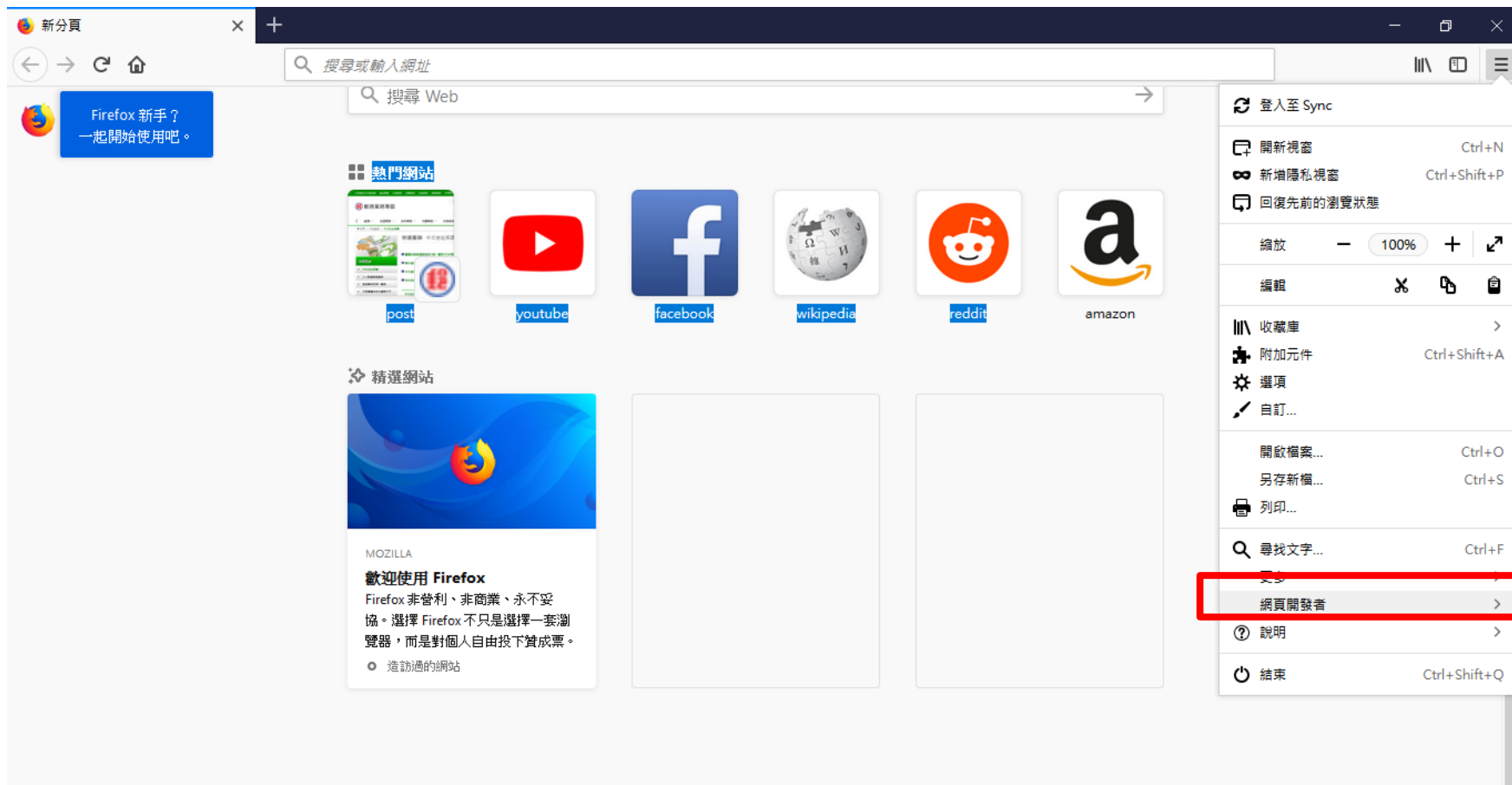
## INTERNET EXPLORER'S SPEED VERSUS OTHER BROWSERS



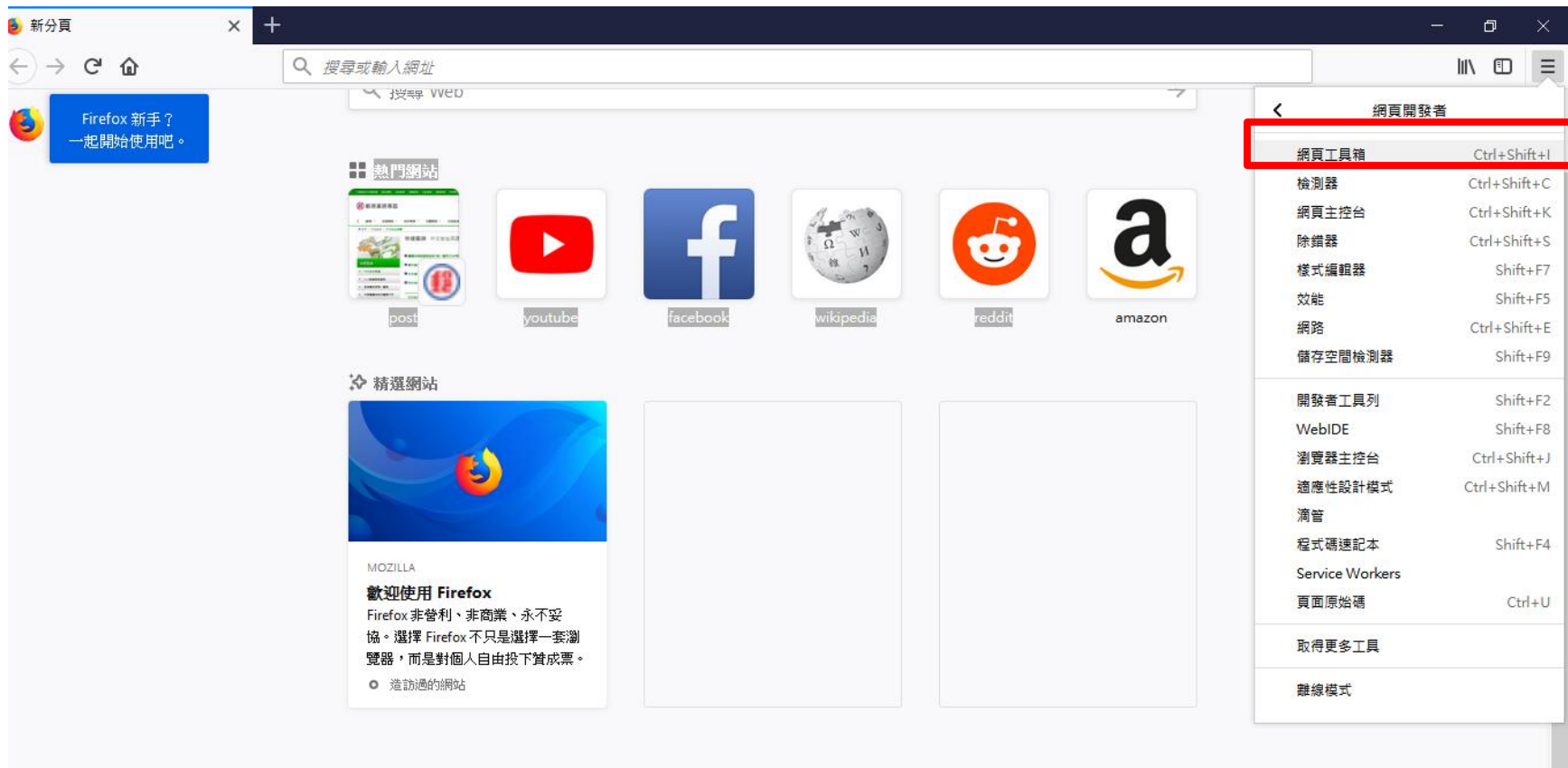
# Firefox(recommend)



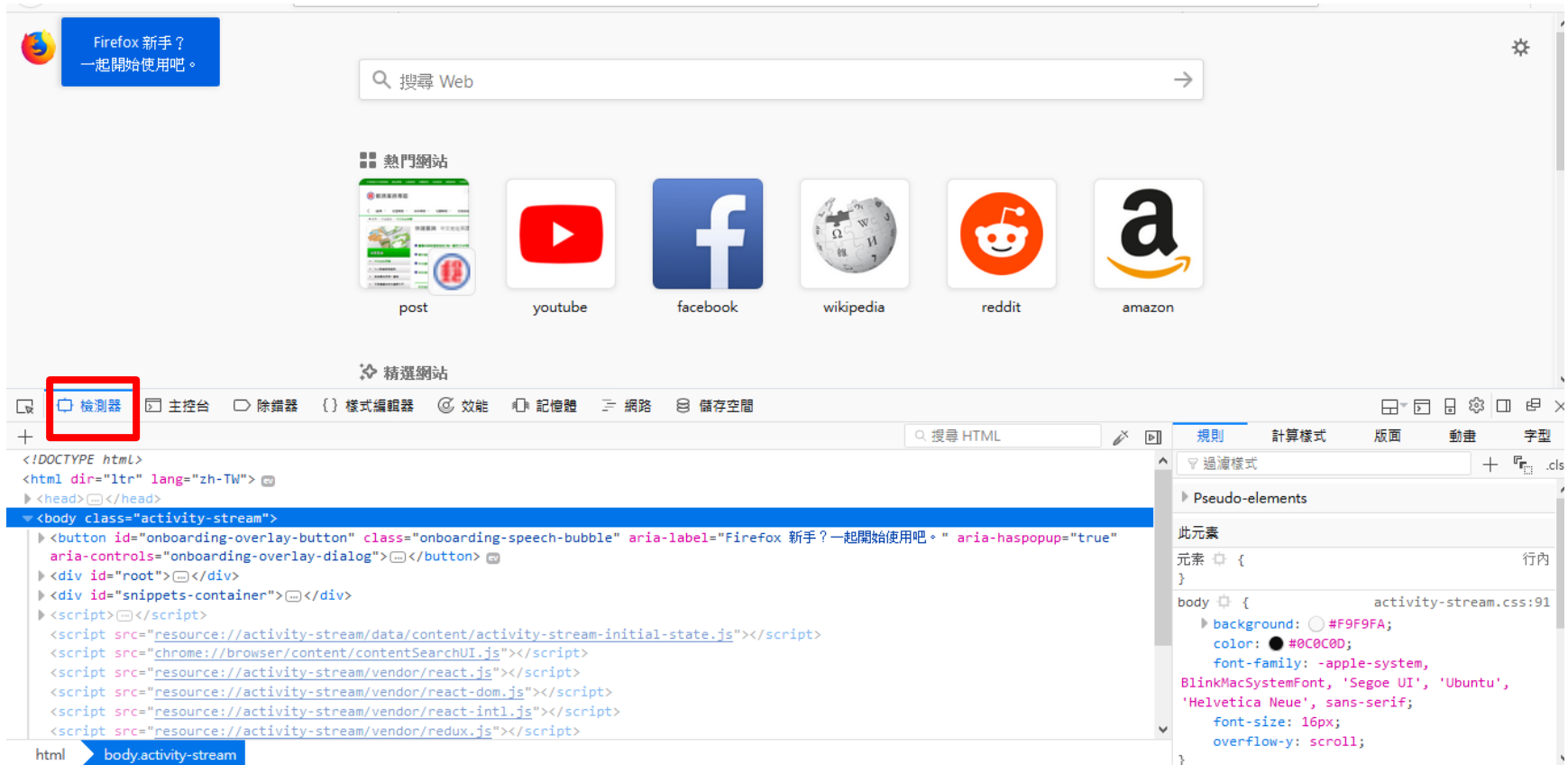
# Firefox(recommend)



# Firefox(recommend)



# Firefox(recommend)



Use "F12" shortcut to open developer tool

# Firefox(recommend)

The screenshot shows the National Taiwan University (NTU) website in a Firefox browser. The browser's address bar displays `www.ntu.edu.tw`. The website header includes navigation links such as "網站導覽", "新生", "在校學生", "國際生", "教職員", "訪客", and "校友". A search bar and a language selector set to "English" are also present. The main content area features a large banner with the NTU logo and the text "國立臺灣大學 National Taiwan University". Below the banner, there are three columns of news and activities, including "最新消息", "活動快報", and "校園推廣". The Firebug developer tool is open at the bottom, showing the "DOM" pane with the selected element being an `img` tag with the source `images/photo/events2Photo.jpg`. The "Console" pane shows a message: "Source Map 錯誤: request failed with status 404".

Click "select" button to observe any elements on the webpage

# Firefox(recommend)

國立臺灣大學

www.ntu.edu.tw

網站導覽 | 新生 | 在校學生 | 國際生 | 教職員 | 訪客 | 校友

聯絡我們 站內搜尋: 請輸入關鍵字

English

學術庫 | 圖書館 | 博物館群 | 課程 | 招生 | 推廣教育 | 行事曆 | 捐款

認識臺大 學術單位 研究發展 行政組織 常見詢問 服務資源

★ 最新消息

活動快報

校園推廣

校長遴選專區

10月20日研究生宿舍事件本校後續照護計畫

本校田徑場地事件調查小組完成相關調查

五十重聚邀請學長姐返母校

許炳堅教授演講「AI時代年輕人有哪些選項」

計資中心寒假青少年資訊應用冬令營課程

梅峰山地農場生態體驗營隊

科技部2017秋「展望」系列演講

「一本書店」系列活動

NTU Highlights

臺大電子報

Youtube EDU

FACULTY+

臺大識別系統

臺大出版品

img 116 x 180

↑ TOP

檢測器 主控台 除錯器 樣式編輯器 效能 記憶體 網路 儲存空間

搜尋 HTML

```
div class="more" style="height:16px;"><a href="http://host.cc.ntu.edu.tw/sec/schinfo/schinfo.asp/show.asp" class="btn" target="_blank" title="更多活動快報(另開新視窗)">更多活動快報</a></div>
-->
</div>
=<div id="events2">
  ><h2></h2>
  
  <a href="http://gc.ntu.edu.tw/" target="_blank" title="畢業典禮(另開新視窗)"></a> <a href="http://event.ntu.edu.tw/festival/" target="_blank" title="創校89年校慶(另開新視窗)"></a>
</div>
```

規則 計算樣式 版面 動畫 字型

過濾樣式

元素 {

#main responsive.css:506 @ (min-width: 600px)

.row

.col2 #events2 img {

right: 12px;

top: 57px;

position: absolute;

height: 180px;

width: 116px;

Directly click html code can also observe elements in the website



# Chrome

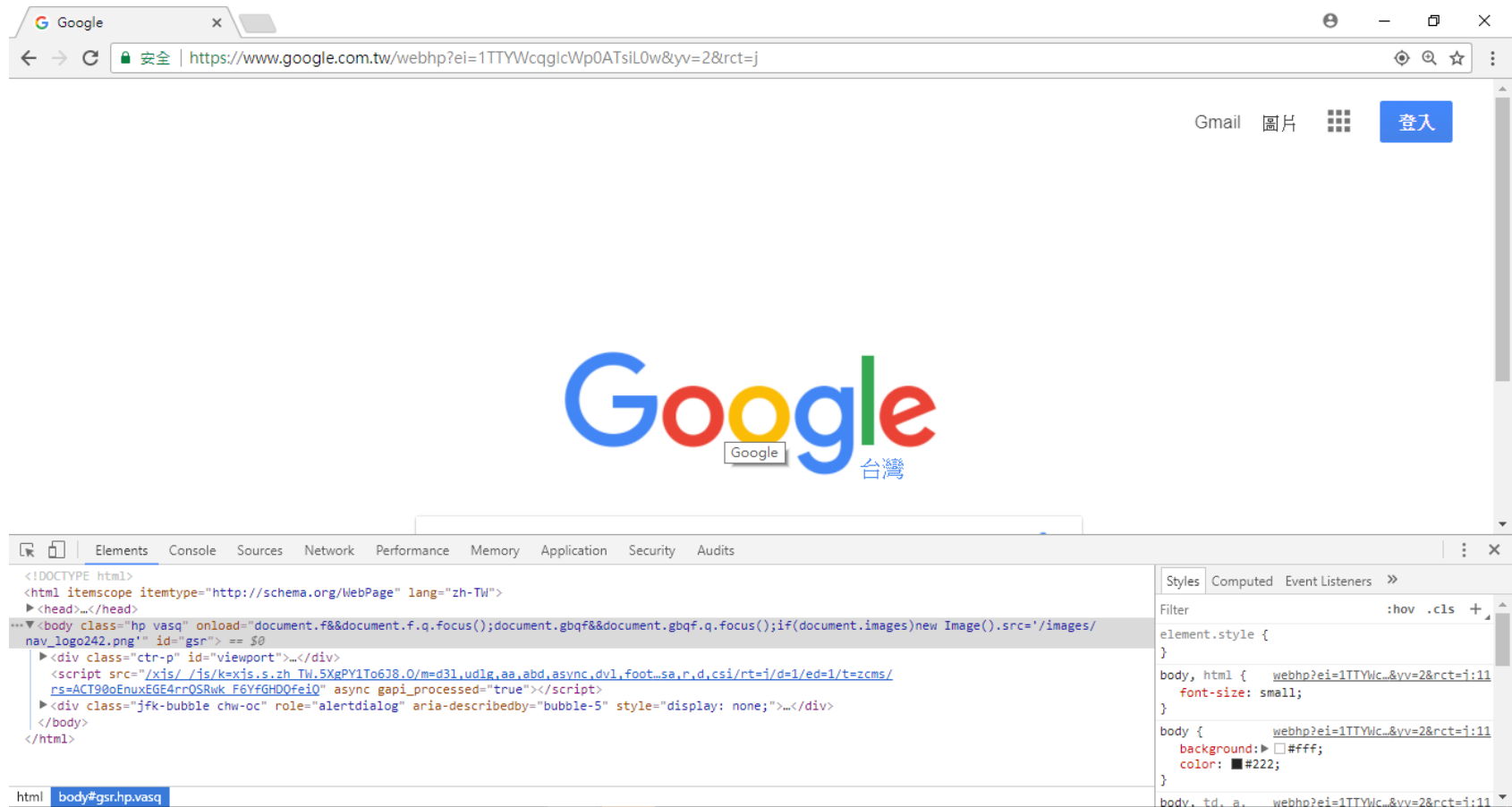
---



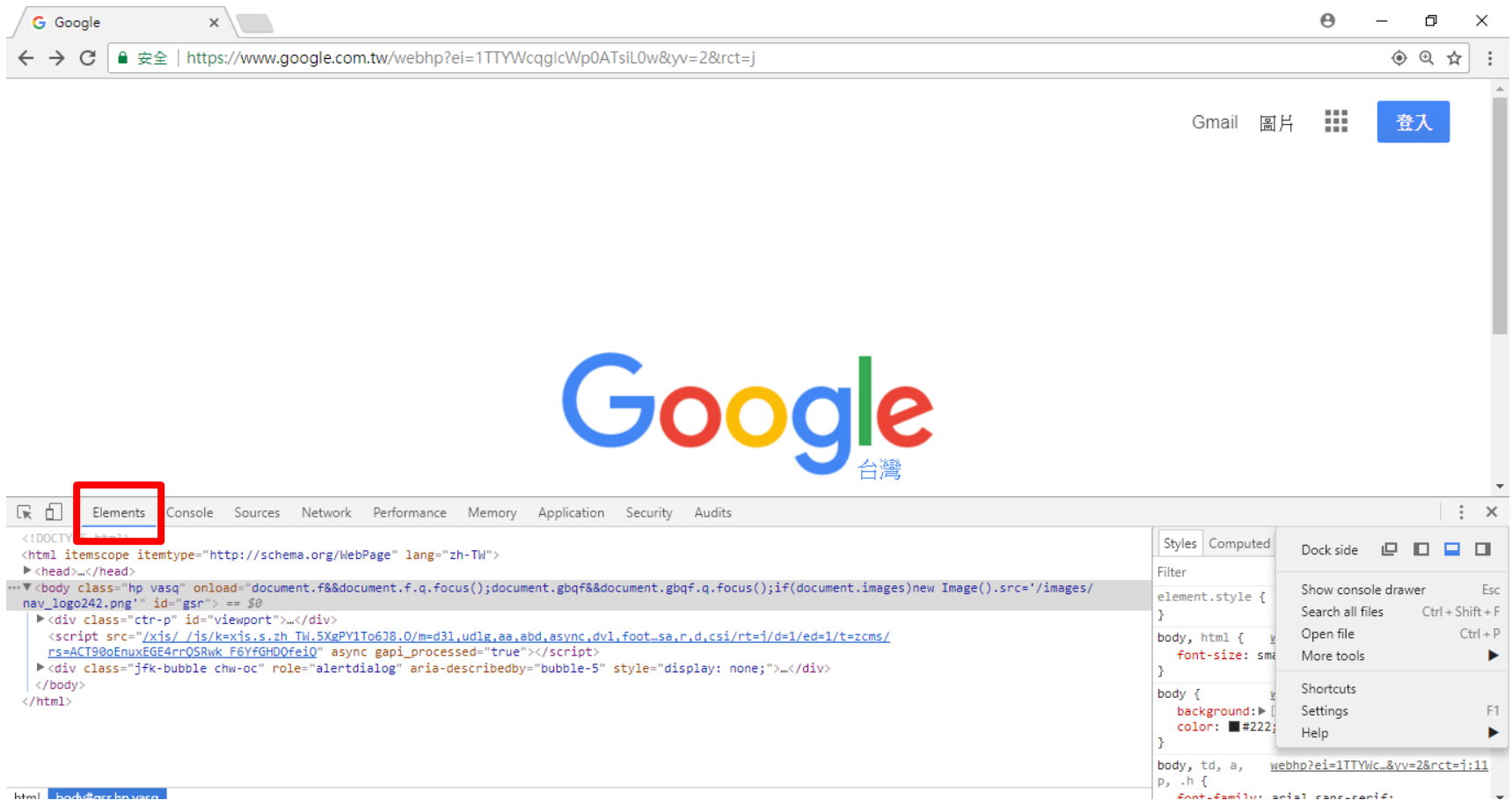
# Chrome



# Chrome



# Chrome



Use "F12" shortcut to open developer tool



# Example and Exercise (5 min)

---

- ▶ Please install Firefox

- ▶ <https://www.mozilla.org/zh-TW/firefox/new/>

- ▶ Please observe different elements in different web

- ▶ <http://www.tse.com.tw/zh/>

- ▶ <http://rate.bot.com.tw/xrt?Lang=zh-TW>

- ▶ <http://www.cnyes.com/usastock/>

# Modern web

---

- ▶ Web consist of three different part
  - ▶ **HTML** define the content of web pages
  - ▶ **CSS** specify the layout of web pages
  - ▶ **JavaScript** program the behavior of web pages



# What's HTML

---

- ▶ **H**yper**T**ext **M**arkup **L**anguage
  - ▶ Consist of many elements
- ▶ Each elements contain opening/closing tag, attribute and its content

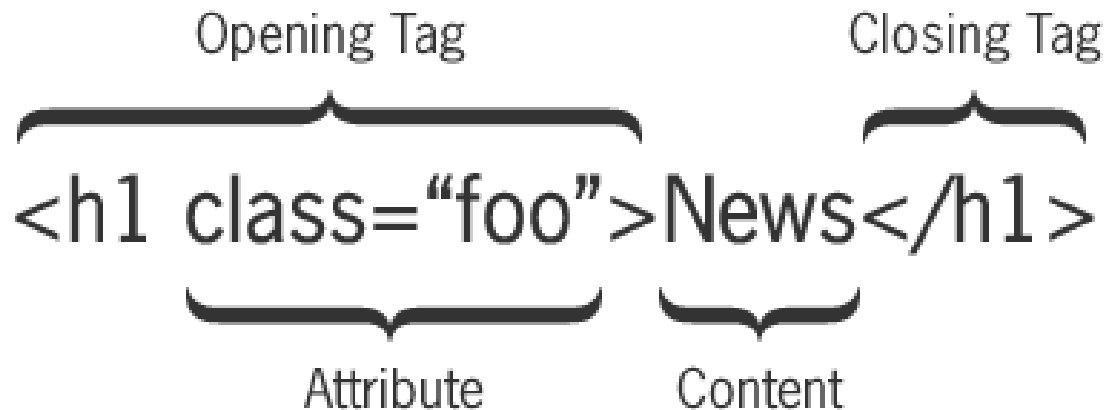
Opening Tag                      Closing Tag

⏟                      ⏟

<h1 class="foo">News</h1>

⏟                      ⏟

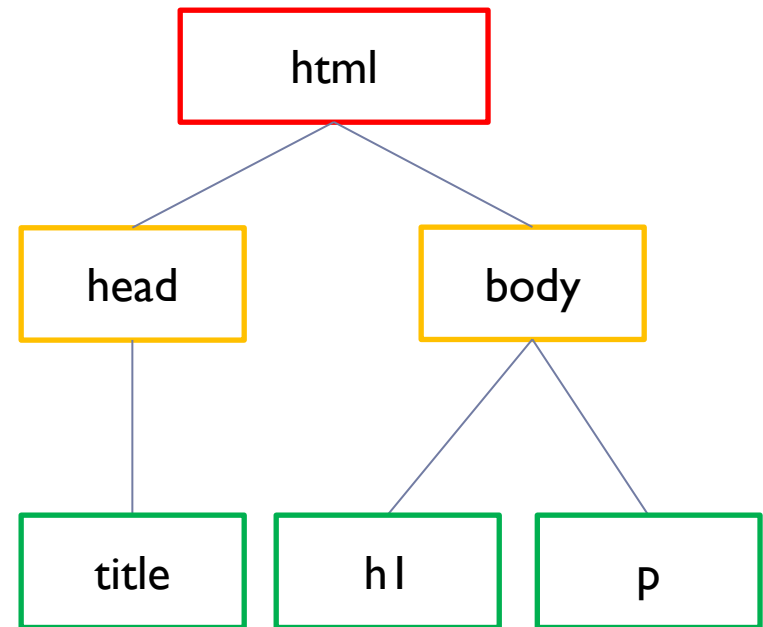
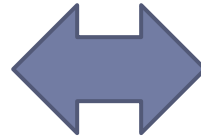
Attribute                      Content

A diagram illustrating the components of an HTML element. The text "<h1 class='foo'>News</h1>" is shown. Above it, a bracket spans from "<h1" to ">" and is labeled "Opening Tag". Another bracket spans from "</h1" to ">" and is labeled "Closing Tag". Below the text, a bracket spans from "class='foo'" to ">" and is labeled "Attribute". A second bracket spans from "News" to "</h1" and is labeled "Content".

# Html Concept

---

```
<!DOCTYPE html>
<html>
  <head>
    <title>hello html</title>
  </head>
  <body>
    <h1>This is h1 tag</h1>
    <p>This is p tag</p>
  </body>
</html>
```





# Common tags

---

Tag Name	Purpose
<code>&lt;h1&gt; - &lt;h6&gt;</code>	Title
<code>&lt;p&gt;</code>	Paragraph
<code>&lt;a&gt;</code>	Hyper link
<code>&lt;table&gt;</code>	Table
<code>&lt;tr&gt;</code>	Row in table
<code>&lt;td&gt;</code>	Cell in table
<code>&lt;img&gt;</code>	image
<code>&lt;/br&gt;</code>	Line break(no end tag)

•  
•  
•

# Example and Exercise (6 min)

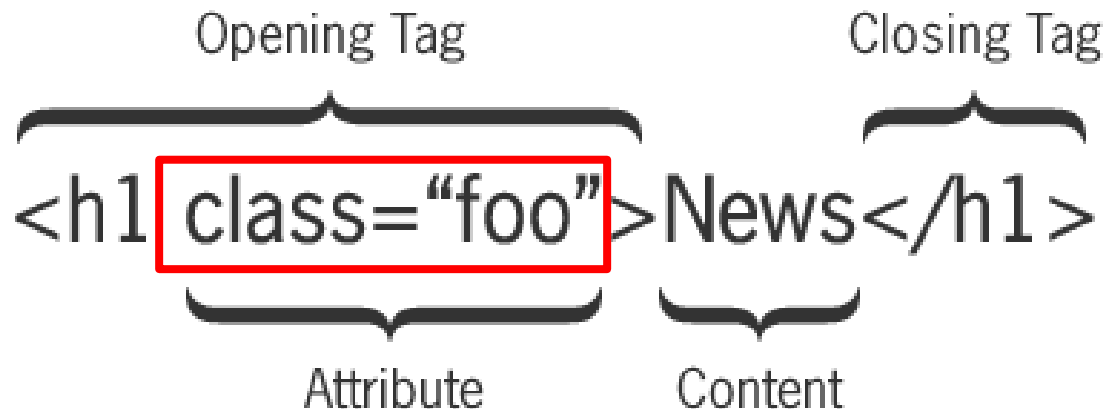
---

- ▶ html hello word example
  - ▶ [example/html\\_css\\_js/hello\\_html.html](#)
- ▶ html common tags
  - ▶ [example/html\\_css\\_js/common\\_tags.html](#)
- ▶ If you would like to know more tags, please reference
  - ▶ [https://www.w3schools.com/Tags/default.asp](#)

# HTML Attributes

---

- ▶ You can describe attributes on each tags
  - ▶ Usually, it is inside each start tag
- ▶ One tag can have multiple attributes



# Common Attributes

---

Attribute Name	Purpose
id	id of a tag (can not duplicate in a file)
class	class of a tag(can duplicate in a file)
href	Hyper link
src	path of image

•  
•  
•

# Example and Exercise (3 min)

---

- ▶ html common attributes
  - ▶ [example/html\\_css\\_js/common\\_attributes.html](example/html_css_js/common_attributes.html)
- ▶ If you would like to know more attributes, please reference
  - ▶ [https://www.w3schools.com/html/html\\_attributes.asp](https://www.w3schools.com/html/html_attributes.asp)
- ▶ Please try to add/modify any attributes

# CSS Introduction

---

## ▶ Cascading Style Sheets

- ▶ how HTML elements are to be displayed (color, layout, font size, .....)
- ▶ Usually use “style” tag
- ▶ Some save external stylesheets as CSS files



# Example and Exercise (3 min)

---

- ▶ **css example**
  - ▶ [example/html\\_css\\_js/css\\_example.html](example/html_css_js/css_example.html)
- ▶ **External css file example**
  - ▶ [example/html\\_css\\_js/external\\_css\\_example.html](example/html_css_js/external_css_example.html)
- ▶ **If you would like to know more css style, please reference**
  - ▶ <https://www.w3schools.com/css/>
- ▶ **Please try to add/modify any css style**

# Introduction to Javascript

---

- ▶ JavaScript is the programming language of HTML and the web
- ▶ It make webpages interactive
- ▶ jQuery is a fast, small, and feature-rich JavaScript library
  - ▶ Usually be used by web developers because of it is more elegant





# Example and Exercise (3 min)

---

- ▶ jquery example
  - ▶ [example\html\\_css\\_js\jquery\\_example.html](#)
- ▶ External jquery file example
  - ▶ [example\html\\_css\\_js\external\\_jquery\\_example.html](#)
- ▶ If you would like to know more jquery, please reference
  - ▶ [https://www.w3schools.com/jquery/](#)

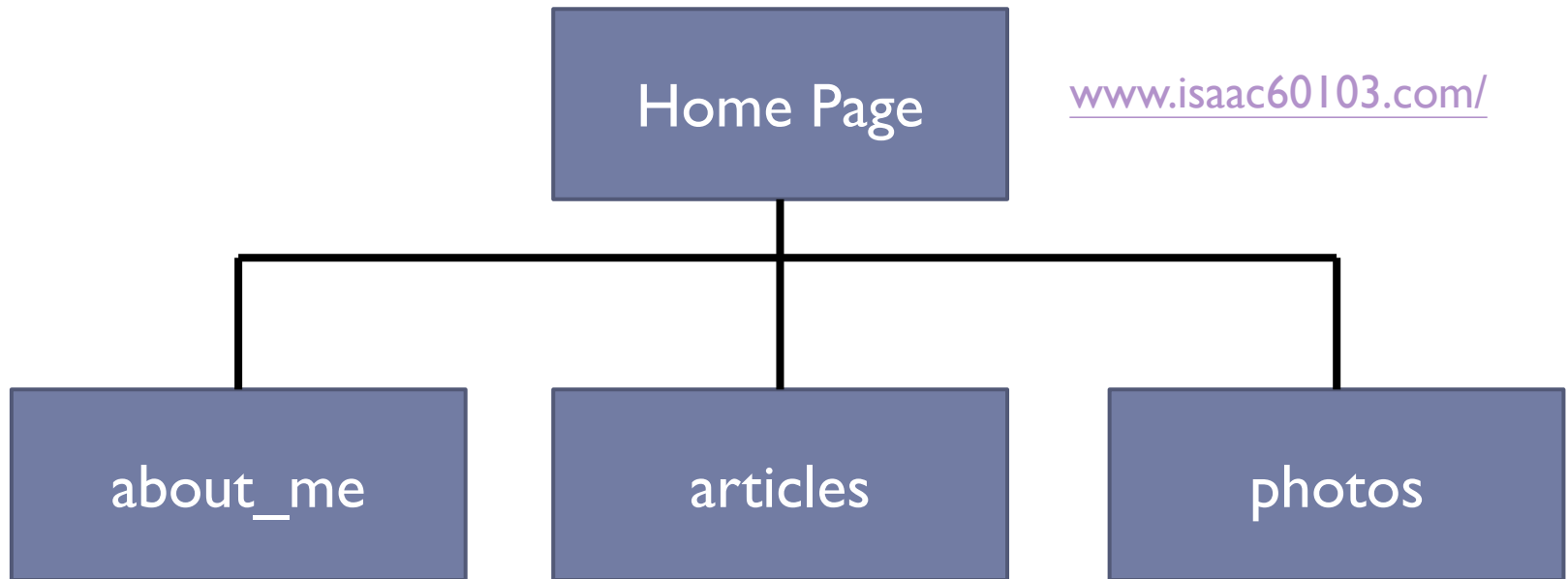
# Front-End and Back-End

---



# Web Structure

---



[www.isaac60103.com/about\\_me](http://www.isaac60103.com/about_me) [www.isaac60103.com/articles](http://www.isaac60103.com/articles) [www.isaac60103.com/photos](http://www.isaac60103.com/photos)



Relative url

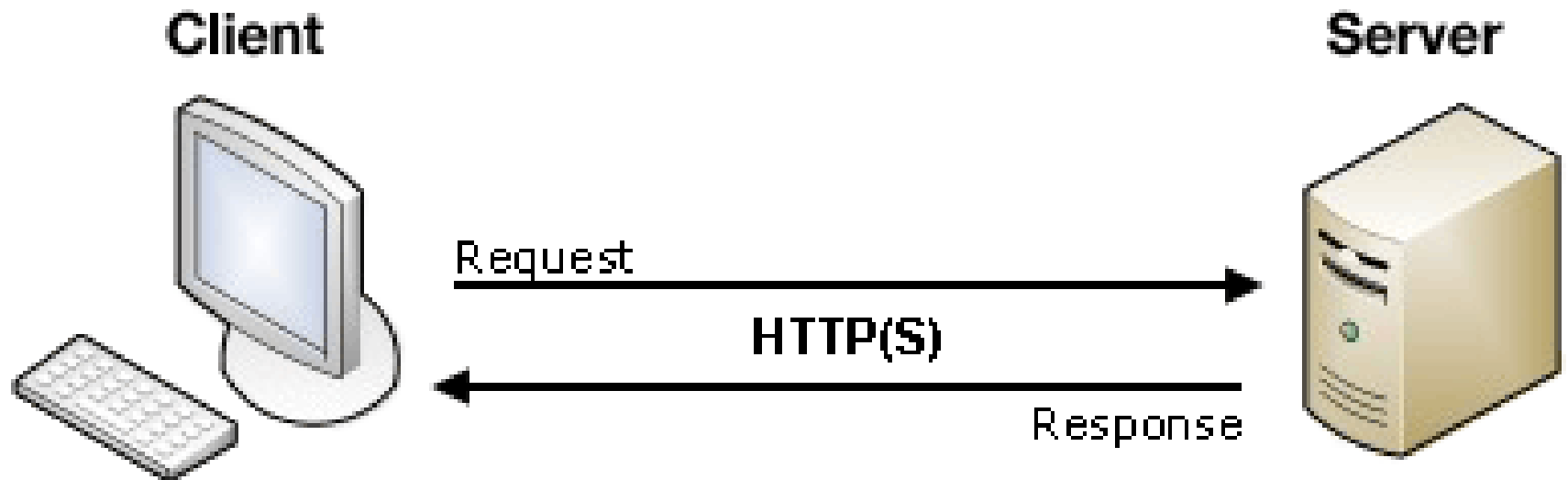
# Example and Exercise

---

- ▶ Relative url on web page
  - ▶ <https://www.isaac60103.com/>

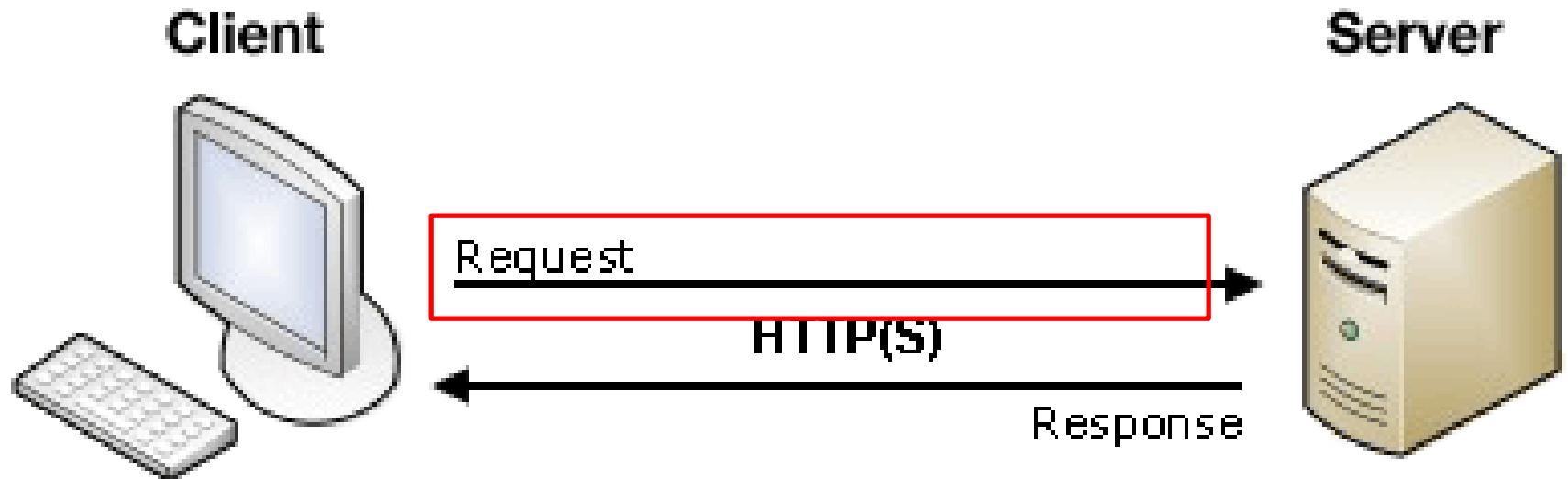
# How to get html from server

---



# How to get html from server

---

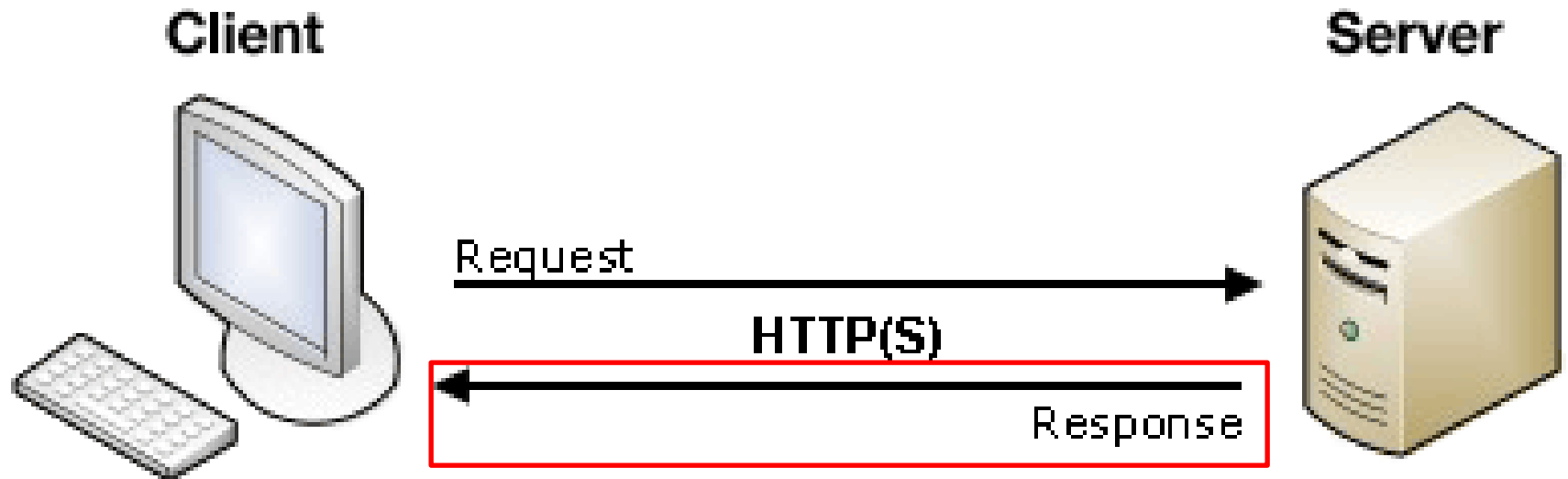


Usually request method:

- Get
- Post

# How to get html from server

---



Response:

- Status code
- Html file

# Status code

---

Status code	Meaning
200	OK
403	Forbidden
404	Not found
500	Internal Server Error
503	Service Unavailable
504	Gateway Timeout



# Html file

## ► <http://www.ntu.edu.tw/>

```
<title>學術單位 - 國立臺灣大學</title>
</head>
<body>
<header data-collapse="off" id="Mheader">
<noscript>
<div id="topbar">
<div class="container">
<div id="student">
<ul>
<div class="accesskey"><a accesskey="U" title="上方導覽連結區" href="#">:::</a></div>
<li><a href=".." sitemap.html" title="網站導覽">網站導覽</a></li>
<li><a href="http://reg.aca.ntu.edu.tw/newstu" target="_blank" title="新生 (另開視窗)">新生</a></li>
<li><a href="https://my.ntu.edu.tw/?block=5,6" target="_blank" title="在校學生 (另開視窗)">在校學生</a></li>
<li><a href="https://www.oia.ntu.edu.tw" target="_blank" title="國際生 (另開視窗)">國際生</a></li>
<li><a href="https://my.ntu.edu.tw/?block=1,2,4" target="_blank" title="教職員 (另開視窗)">教職員</a></li>
<li><a href="http://visitorcenter.cloud.ntu.edu.tw/" target="_blank" title="訪客 (另開視窗)">訪客</a></li>
<li><a href="http://homepage.ntu.edu.tw/~ntualumni/" target="_blank" title="校友 (另開視窗)">校友</a></li>
</ul>
</div>
<div id="search">
<ul>
<li><a href="http://www.ntu.edu.tw/oldchinese/" target="_blank" title="回舊站 (另開視窗)">回舊站</a></li>
<li><a href=".." contact.html" title="聯絡我們">聯絡我們</a></li>
<!--<li>站內搜尋</li-->
<li>
<form action="http://www.google.com/cse" id="cse-search-box" style="width: 200px;">
<label for="keyword">站內搜尋 : </label>
<input type="hidden" name="cx" value="011987122760880416627:zsgqazvzk4">
<input type="hidden" name="ie" value="utf-8">
<input id="searchInput" type="text" value="請輸入關鍵字" onkeypress="if(this.value=='請輸入關鍵字'){this.style.color='';this.value='';}" onclick="if(this.value=='請輸入關鍵字'){this.style.color='';this.value='';}" onblur="if(!this.value.length){this.style.color='#999999';this.value='請輸入關鍵字';}" maxlength="2048" name="q">
<input type="image" alt="開始搜尋" title="開始搜尋" src=".." images/search.png" name="go" class="searchBtn">
<input type="hidden" value="www.google.com/cse/home?cx=011987122760880416627:zsgqazvzk4" name="siteurl">
<input type="hidden" value="www.google.com/cse/panel/basics?cx=011987122760880416627:zsgqazvzk4&sig=__oj8F1PpI1CTk40CeiWf1D1J4PyGE=" name="ref">
</form>
</li>
</ul>
</div>
<div id="webType">
<ul>
<li class="mobileWebType2"><a id="EngLink" href=".." english/academics/academics.html" title="English">English</a></li>
</ul>

```

# GET V.S. POST

---

## ▶ GET

- ▶ URL would change when browsing different content

## ▶ POST

- ▶ URL would not change but content in web page would change under different user's requests
- ▶ Submit private data to server (FB login ..... ) usually use post



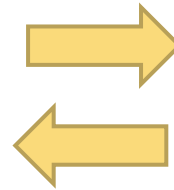
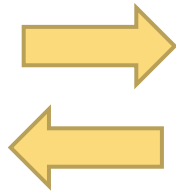
---

# Flask



# Web Service Framework

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Flask & SQLAlchemy

# What's flask

---

- ▶ Flask is a web application framework written in Python
  - ▶ is based on Werkzeug WSGI toolkit and Jinja2 template engine
  - ▶ a micro web framework



# WSGI

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- ▶ Web Server Gateway Interface (WSGI) is a standard for Python web application development
  - ▶ Werkzeug a WSGI toolkit
  - ▶ Flask framework uses Werkzeug as one of its bases



# MVC

---

- ▶ **Model**

- ▶ responsible for managing the data of the application. It receives user input from the controller

- ▶ **View**

- ▶ presentation of the model in a particular format

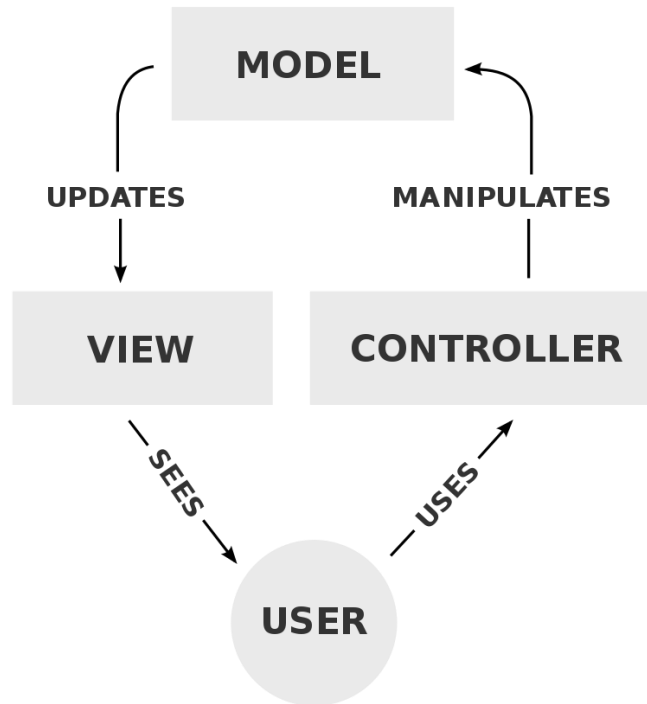
- ▶ **Controller**

- ▶ responds to the user input and performs interactions on the data model objects

# MVC

---

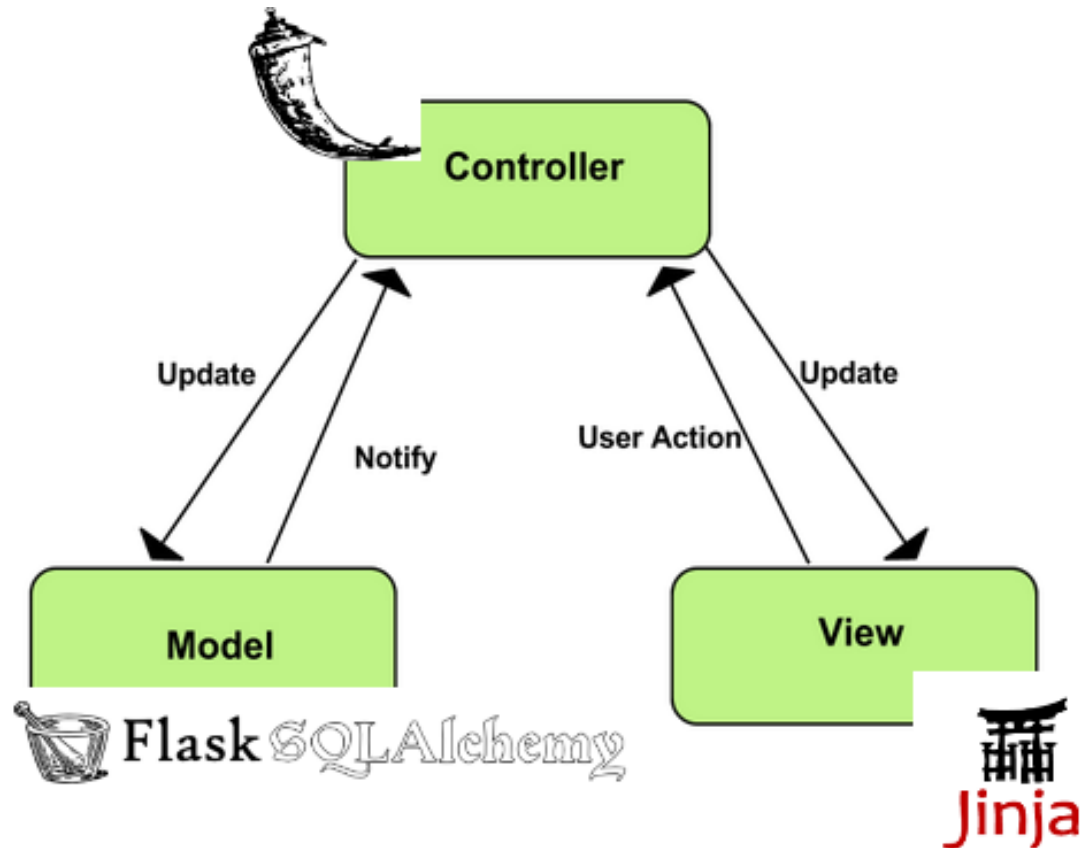
- ▶ Model–view–controller(MVC) is a software design pattern





# MVC in flask

---



# Jinja2

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- ▶ a popular templating engine for Python
  - ▶ <http://docs.jinkan.org/docs/jinja2/templates.html>



# Jinja2 template syntax

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<b>syntax</b>	<b>Description</b>
<code>{% ... %}</code>	used for Statements
<code>{{ ... }}</code>	used for Expressions to print to the template output
<code>{# ... #}</code>	used for Comments not included in the template output
<code># ... ##</code>	used for Line Statements

# What's Bootstrap

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- ▶ a free and open-source CSS framework directed at responsive, mobile-first front-end web development
  - ▶ <https://getbootstrap.com/>
- ▶ Bootstrap resource:  
<https://www.w3schools.com/bootstrap4/default.asp>



# flask-bootstrap

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- ▶ flask-bootstrap is flask extension
  - ▶ help developer to use bootstrap front-end under flask environment
  - ▶ <https://pythonhosted.org/Flask-Bootstrap/>

# Flask WTF

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- ▶ Flask-WTF extension provides a simple interface to generate form
  - ▶ can define the form fields in our Python script and render them using an HTML template
  - ▶ <https://flask-wtf.readthedocs.io/en/stable/>



# WTForms Standard form field

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Column object	Description
<b>TextField</b>	Represents <input type = 'text'> HTML form element
<b>BooleanField</b>	Represents <input type = 'checkbox'> HTML form element
<b>DecimalField</b>	Textfield for displaying number with decimals
<b>IntegerField</b>	TextField for displaying integer
<b>RadioField</b>	Represents <input type = 'radio'> HTML form element
<b>SelectField</b>	Represents select form element
<b>TextAreaField</b>	Represents <testarea> html form element
<b>PasswordField</b>	Represents <input type = 'password'> HTML form element
<b>SubmitField</b>	Represents <input type = 'submit'> form element

# WTForms validation

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Validators Class	Description
<b>DataRequired</b>	Checks whether input field is empty
<b>Email</b>	Checks whether text in the field follows email ID conventions
<b>IPAddress</b>	Validates IP address in input field
<b>Length</b>	Verifies if length of string in input field is in given range
<b>NumberRange</b>	Validates a number in input field within given range
<b>URL</b>	Validates URL entered in input field



# SQLAlchemy

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- ▶ an open-source SQL toolkit and object-relational mapper (ORM)
  - ▶ an extension for Flask
  - ▶ <https://flask-sqlalchemy.palletsprojects.com/en/2.x/>

**Flask** SQLAlchemy