

CSCI4140 - Tutorial 10

Introduction To Chrome Extension & jQuery DOM Tree

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Outline

- ⌚ What is Chrome Extension? Recap
- ⌚ How to select DOM Object in jQuery?
- ⌚ Sample Chrome Extension

Chrome Extension

- Powerful tools to interact with Chrome and the web content!

Extensions

[More Extension Results](#)

ADDED



Unblock Youku
from zhuzhu.org

Helps users access their web services while travelling outside mainland China.

RATE IT

Developer Tools

(16908)



Free Rider HD
from www.freeriderhd.com

Race bikes on tracks drawn by other players or draw your own! Official Free Rider sequel and replacement to Canvas Rider.

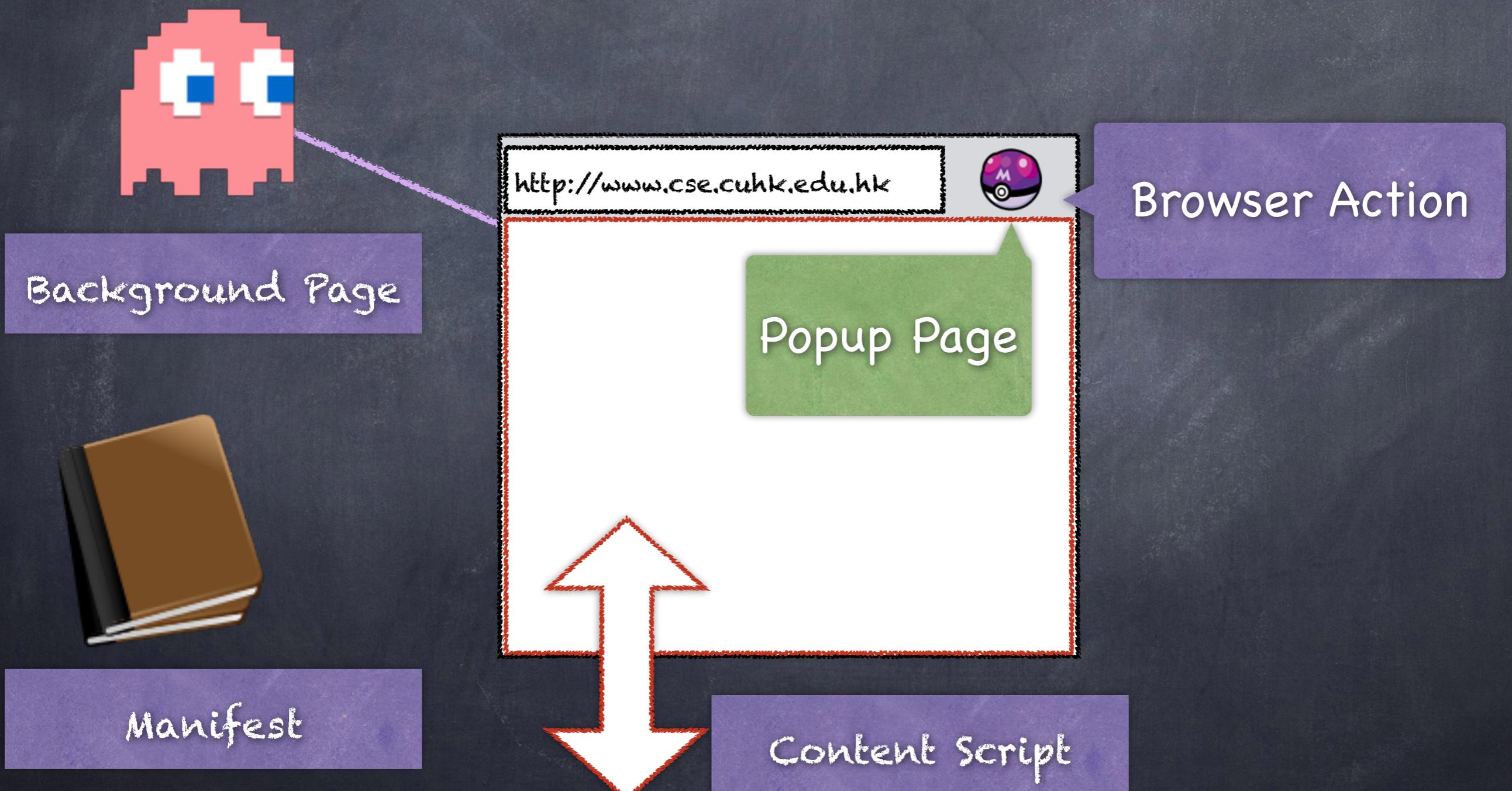
FREE

Arcade & Action

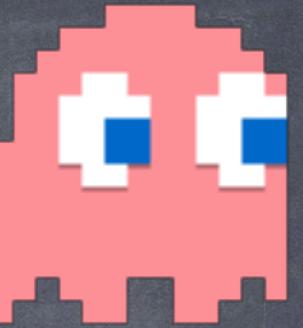
(924)

Don't do that in real life btw....

Chrome Extension - Architecture



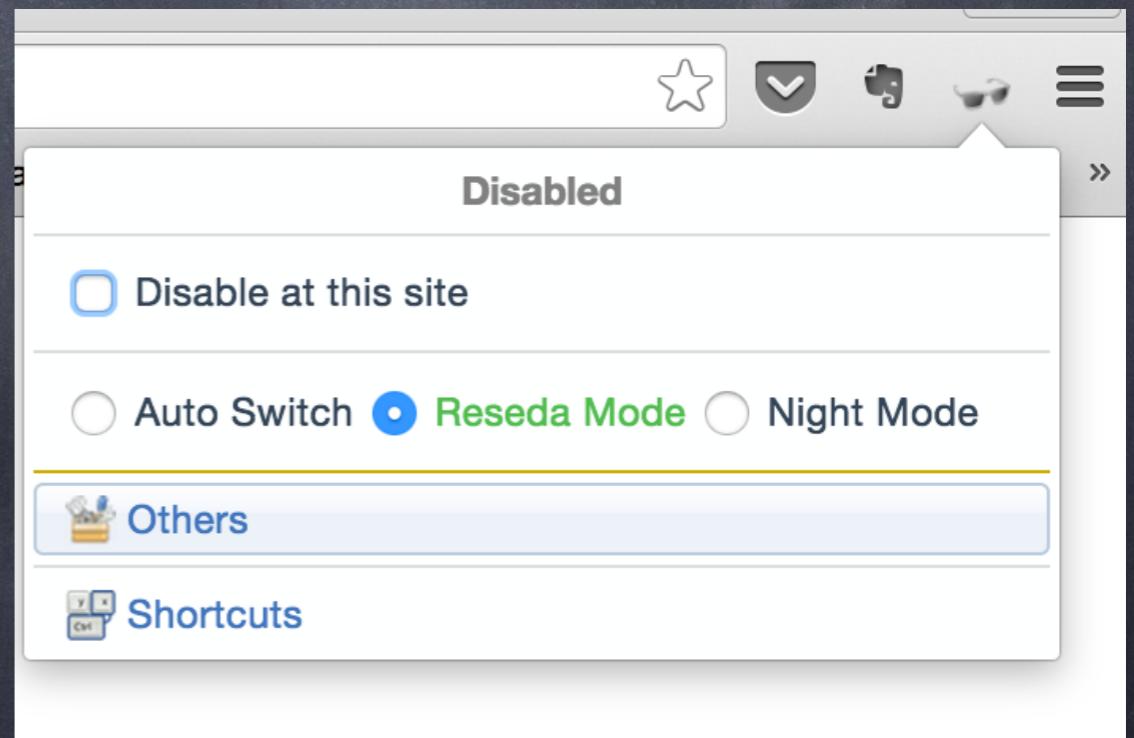
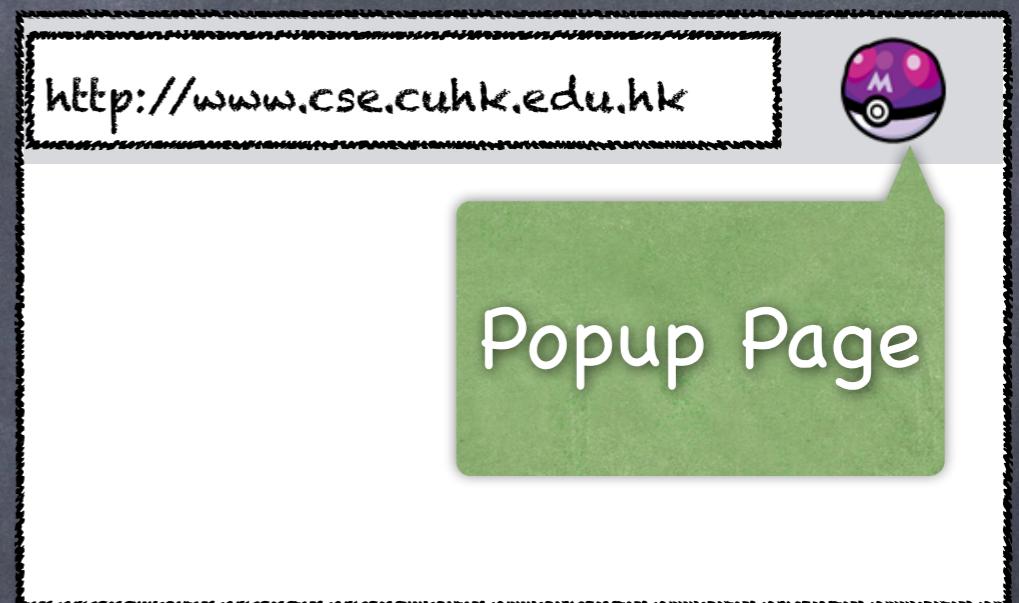
Background Page



- “Spirit” of the extension
- Do most of the jobs behind the Chrome.
- Exists in the lifetime of an extension
- Example: Checking the Mail and send you alerts.

Browser Action

- An optional UI page to interact with Users when the button is clicked.



Content Script

- The only component can directly access the Document Object Model (DOM) of the webpage.
- Directly be injected into the webpage.



Communication among those components

- ⦿ Content scripts cannot run Chrome API
 - ⦿ Eg: Notification, Storage etc.
- ⦿ Background Page cannot access DOM Object
- ⦿ Solution: Use Message Passing!

Message Passing

`chrome.runtime.sendMessage`



`chrome.runtime.onMessage.addListener`

Background Page

Sample Chrome Extension

- It is annoying to enter student ID and password each time!! 😞
- Let's do something to automate the form completion task.....

 Login to CUHK Wi-Fi Service

Note:

1. The CUHK Wi-Fi Service is for University staff and students exclusively use only.
2. By default, you can browse CUHK homepage at <http://www.cuhk.edu.hk> even though you have not yet login to the Wi-Fi service. For other webpages, you will be first prompted to enter your account.
3. Logging in the service indicates you have read and accepted the [Use Policies and Guidelines](#).
4. Except for the initial CWEM authentication, all the data are transferred in plain text without encryption.
5. For a secured connection or accessing some University restricted websites, you should run a [VPN](#) connection additionally over this Wi-Fi service.
6. According to the University policy, Win XP computer is not allowed to connect to the campus network. Please upgrade your computer to Win 7 or above if you want to connect to the campus network.
7. For service details, please visit <http://www.cuhk.edu.hk/itsc/network/wlan>

Please enter your CWEM account and password to login CUHK Wi-Fi Service.

Computing ID

CWEM Password

CADS
(CADS Reference Number: 048)

For any enquiries, please contact ITSC Service Desk at <http://servicedesk.itsc.cuhk.edu.hk>

Information Technology Services Centre, The Chinese University of Hong Kong.

CUHK Wi-Fi Login Helper



Background Page

- Handle Browser Action
- Prompt Notification

- Click to open login page

Browser Action

<http://www.cse.cuhk.edu.hk>



Content Script

- Fill in the form
- Get the result and tell BG Page

Manifest



```
{  
  "name": "CUHK Login WiFi Login Tool",  
  "manifest_version": 2,  
  "version": "1.0",  
  "description": "A Demo Extension for logging in to the CUHK WiFi",  
  "icons": { "48": "cuhk.png" },  
  "background": {  
    "scripts": [ "background.js" ]  
  },  
  "permissions": [ "activeTab", "tabs", "notifications" ],  
  "browser_action": {  
    "default_title": "",  
    "default_icon": "cuhk.png"  
  },  
  "content_scripts": [  
    {  
      "matches": [ "https://securelogin.wlan.cuhk.edu.hk/upload/custom/CU_Portal/  
*", "file:///*" ],  
      "js": [ "jquery-2.1.3.min.js", "action.js" ],  
      "run_at": "document_end"  
    }  
  ]  
}
```

Basic Info

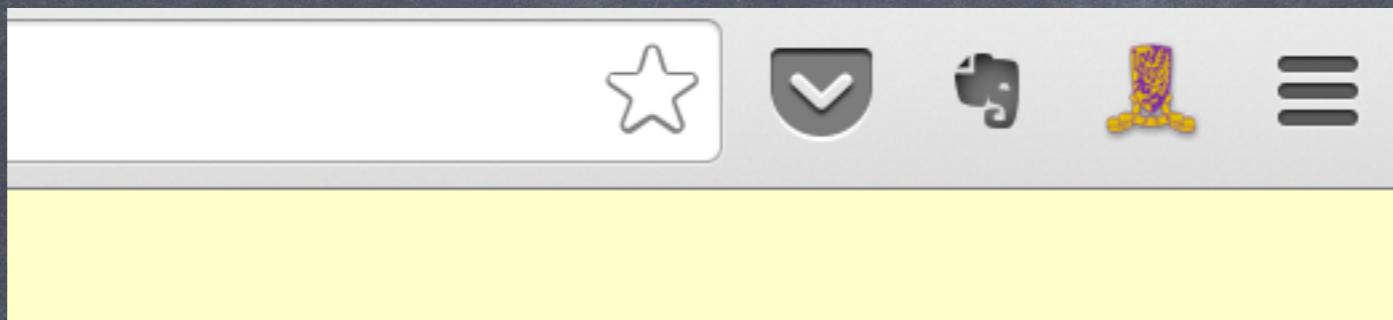
Background Script

Permission

Browser Action

Content Script

Browser Action



Clicked to create a tab to navigate to login page
-> onClick Listener!

Need "tabs" permission here

```
chrome.browserAction.onClicked.addListener(function(tab){  
    chrome.tabs.create({url:"https://  
securelogin.wlan.cuhk.edu.hk/upload/custom/CU_Portal/  
login.html"},function(tab){  
});  
});
```

Content Script

- To Fill in the form, we need to find the target!

- We can use Chrome Developer Console to peek who are they... ☺

Computing ID

CWEM Passw

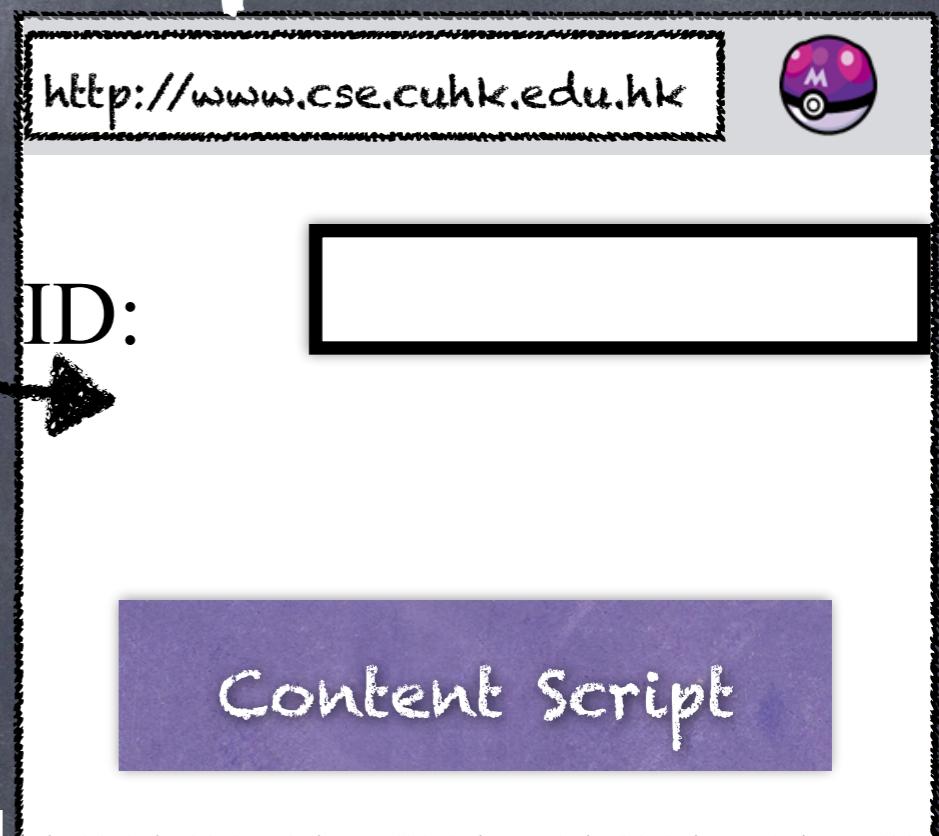
Log In

This is a CADS-
registered IT
System. It passed
(CADS Reference Number: 048)

For any enquiries, please contact ITSC Service Desk at <http://servicedesk.itsc.cuhk.edu.hk>

Elements Network Sources Timeline Profiles Resources Audits Console

```
> <script>...</script>
  <div id="errorbox" style="display: none">
  </div>
  <table width="708" border="0">
    <tbody>
      <tr>
        <td width="388">
          <label for="user" accesskey="u">Computing ID </label>
          <input type="text" name="user" id="user" size="25" class="text" accesskey="u"
          using CWEM accounts">
        </td>
        <td width="320">
          <div id="passwordbox">...</div>
          <div id="fqdnbox" style="display: none"></div>
          <input type="hidden" name="cmd" value="authenticate">
        </td>
      </tr>
    </tbody>
  </table>
</div>
```



Introduction to jQuery Selector

- In the previous lectures, you learnt a lot about DOM scripting.

```
document.getElementById("ID")
```

Why Not Go jQuery?

```
$("#ID")
```

<http://www.cse.cuhk.edu.hk>



ID:

jQuery

- ⦿ A Great Framework to save our life.
- ⦿ Easy to use, and much handy than using javascript alone.
- ⦿ Borrows the idea of CSS, you can use the css-style selectors to specify the object. 

ID `$("#abc")`

Class `$(".abc")`

Element `("form")`

Sample HTML

```
<form class="form-signin">
<input type="email" id="inputEmail"
class="form-control" placeholder="Email
address">
<input type="password" id="inputPassword"
class="form-control"
placeholder="Password">
<button class="btn btn-lg btn-primary
btn-block" type="submit">Sign in</button>
</form>
```

How do I get the textbox
and change the value?

How do I submit the form?

Sample HTML

```
<form class="form-signin">
<input type="email" id="inputEmail"
class="form-control" placeholder="Email
address">
<input type="password" id="inputPassword"
class="form-control"
placeholder="Password">
<button class="btn btn-lg btn-primary
btn-block" type="submit">Sign in</button>
</form>
```

```
$("#email").val("Hello")
```

```
 $("form").submit()
```

Back to Example

- How do you fill in the form of CUHK Wi-Fi Page?

Please enter your CWEM account and password to login CUHK Wi-Fi Service.

Computing ID

CWEM Password

Log In



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Information Technology Services Centre, The Chinese University of Hong Kong.

```
$("#user").val("s12345678");
$("#password").val("12345678");
$("form").submit();
```

Oops! How about error message?

← → C  https://securelogin.wlan.cuhk.edu.hk/upload/custom/CU_Portal/login.html?errormsg=Authentication%20failed

 Login to CUHK Wi-Fi Service

URL Contains "errormsg"

Note:

1. The CUHK Wi-Fi Service is for University staff and students exclusively use only.
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3. Logging in the service indicates you have read and accepted the [Use Policies and Guidelines](#).
4. Except for the initial CWEM authentication, all the data are transferred in plain text without encryption.
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6. According to the University policy, Win XP computer is not allowed to connect to the campus network. Please upgrade your computer to Win 7 or a
7. For service details, please visit <http://www.cuhk.edu.hk/itsc/network/wlan>

Please enter your CWEM account and password to login CUHK Wi-Fi Service.

Authentication Error - Incorrect Computing ID or Password

Computing ID

CWEM Password

“errorbox” div

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(CADS Reference Number: 048)

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Information Technology Services Centre, The Chinese University of Hong Kong.

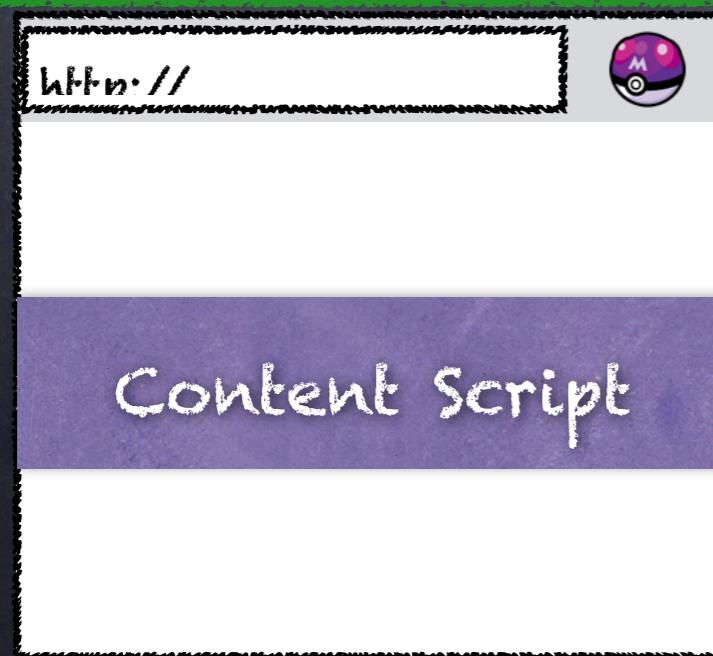
Oops! How about error message?

```
var url = window.location.href;
if(url.search("errmsg") == -1)
{
// Fill In the form la
}
else
{
  if($("#errorbox").length) // Check if the error box div exists
  {
    // Need to tell Background page!
  }
}
```

Message Passing- Sender

```
chrome.runtime.sendMessage(string extensionId, any message, object options,  
function responseCallback)
```

```
var errText = $("#errorbox").text();  
chrome.runtime.sendMessage({msg: errText},  
function(response) {});
```



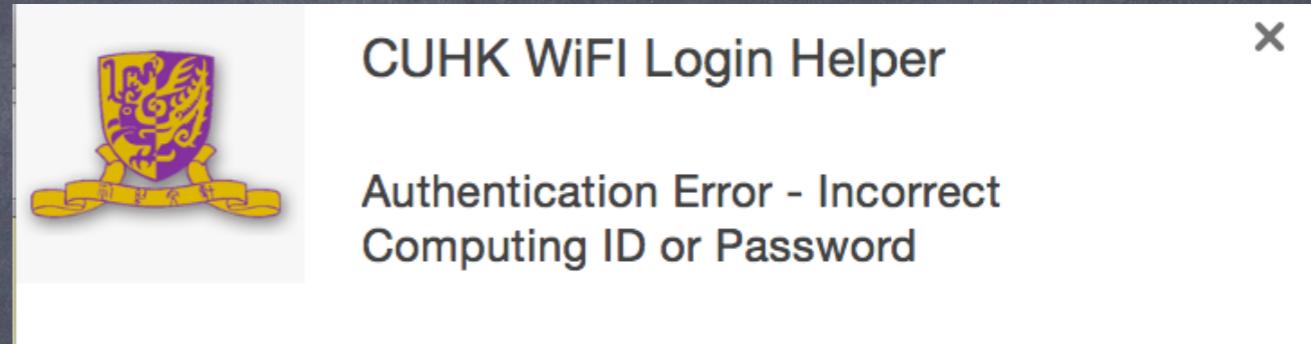
Message Passing- Receiver

- In form of action listener....

```
chrome.runtime.onMessage.addListener(function callback)
```

```
chrome.runtime.onMessage.addListener(function(request, sender,  
sendResponse){  
    // Received in request.msg  
});
```

Notification



- Need to call in background page! (Remember content script is injected already into the webpage.)
- Need to grant “notification” permission in manifest!

```
chrome.notifications.create(string notificationId,  
NotificationOptions options, function callback)
```

```
chrome.notifications.create("",  
{type:"basic",iconUrl:"cuhk.png",title:"CUHK WiFi Login  
Helper",message:request.msg},function(id){});
```

Download this chrome app to help you debug

Debug!

Apps

More App Results

ADDED



Chrome Apps Developer Tool

Chrome Apps & Extensions Developer Tool

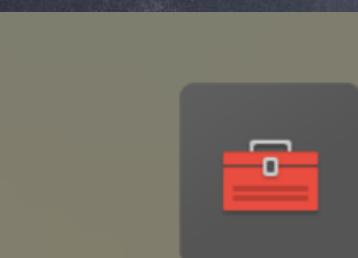
from google.com

Develop and Debug Chrome Apps & Extensions.

RATE IT

Developer Tools

★★★★★ (676)



Chrome A...lper Tool

Unpacked

CUHK Login WiFi Login Tool 1.0
A Demo Extension for logging in to the CUHK Wlfi
ID: klojjcdbmj ejjmckomdobddafeppffirm
Loaded from: /Users/Calvin/Documents/CSCI4140/4140-tut

Filled
Error in event handler for browserAction.onClicked: Error: Invocation of form notifications...
Uncaught SyntaxError: Unexpected token ,

Show more...

Enabled Allow in incognito Allow access to file URLs

Inspect views: background page

Reload Permissions Behavior Pack Uninstall

Getting started example 1.0 (Disabled)
This extension shows a Google Image search result for the current page
ID: pakehkicffmkffdkgkjggdabkkcidpj
Loaded from: /Users/Calvin/Documents/ChromeExt

Enable

Reload Permissions Behavior Pack Uninstall

-END-

We have learnt

- basics of chrome extension
- how to use jQuery to select objects

Next Tutorial: Assignment 3

See You!