

CSCI4140 - Tutorial 10  
Introduction To Chrome  
Extension & jQuery DOM Tree

Week 11

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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](#)



### 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....



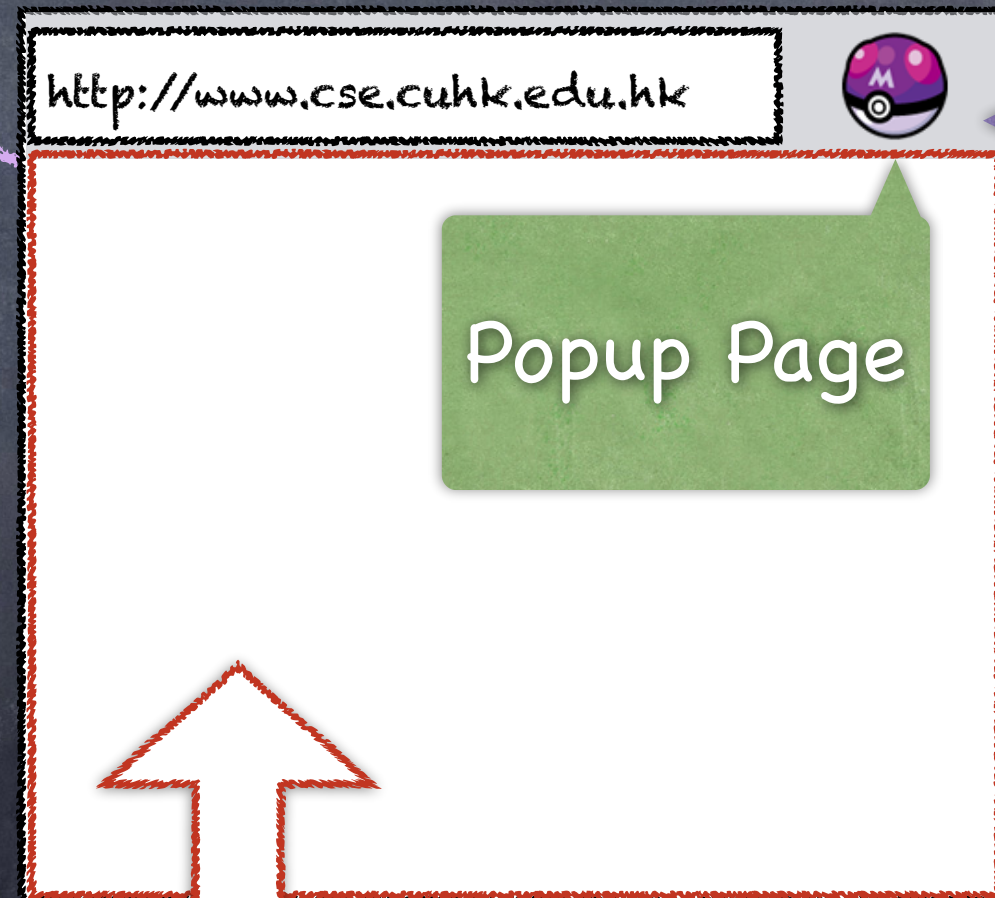
# Chrome Extension - Architecture



Background Page



Manifest



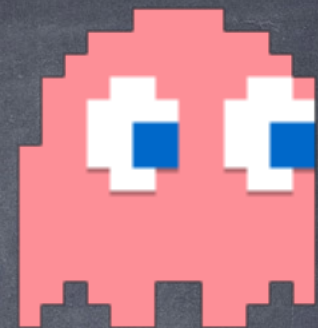
Browser Action

Popup Page

Content Script



# Background Page

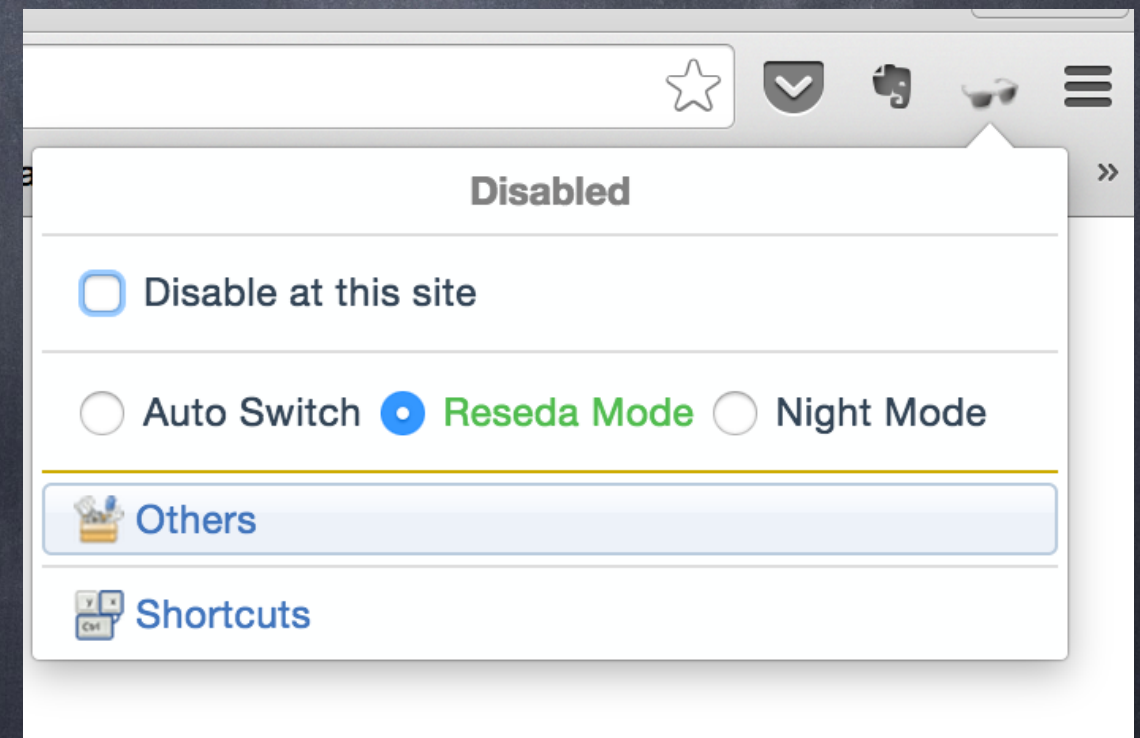
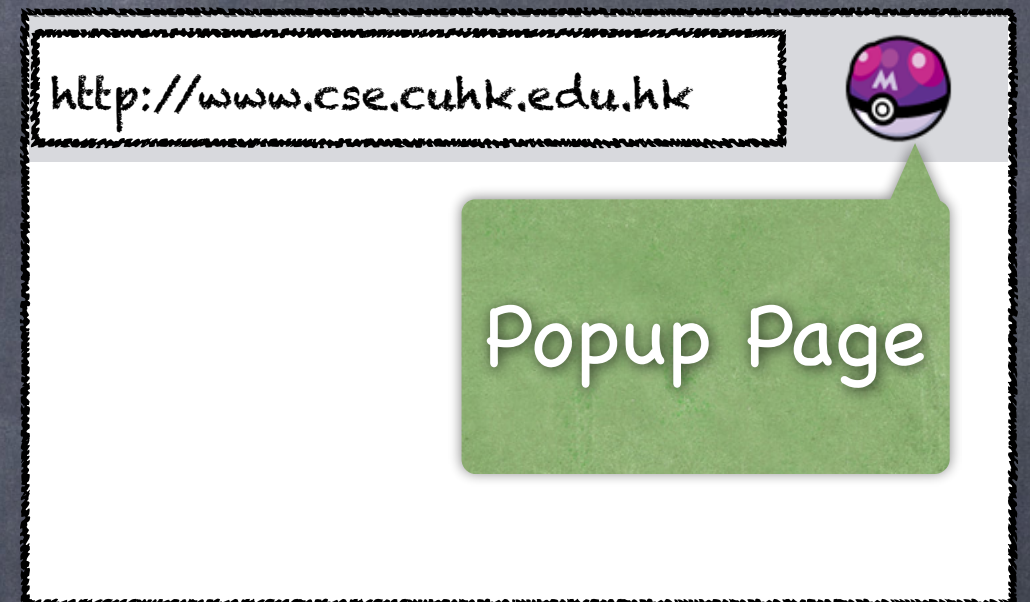


- “Spirit” of the extension
- Do most of the jobs behind the Chrome.
- Exists in the lifetime of an extension
- Example: Checking the Mail and send you alerts.



# 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

Log In

  
(CADS Reference Number: 048)

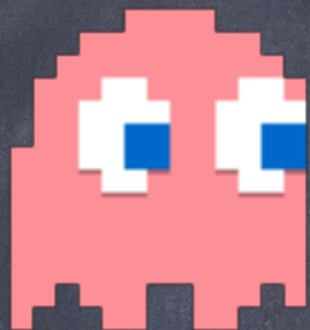
For any enquiries, please contact ITSC Service Desk at <http://servicedesk.itsc.cuhk.edu.hk>

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



# CUHK Wi-Fi Login Helper

Browser Action



Background Page

- Click to open login page

Content Script

- Handle Browser Action
- Prompt Notification

- 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/"],
      "js": ["jquery-2.1.3.min.js", "action.js"],
      "run_at": "document_end"
    }
  ]
}
```

Basic Info

Background Script

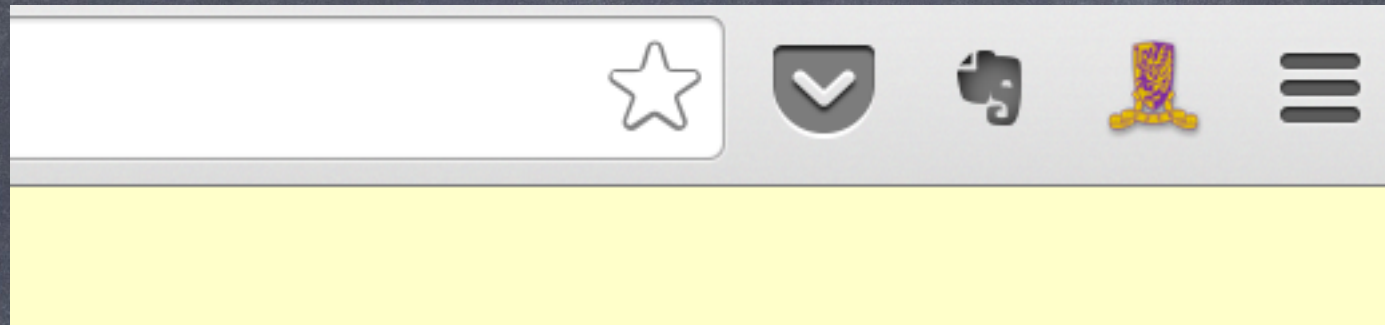
Permission

Browser Action

Content Script



# Browser Action



Clicked to create a tab to navigate to login page  
→ onClick Listener!

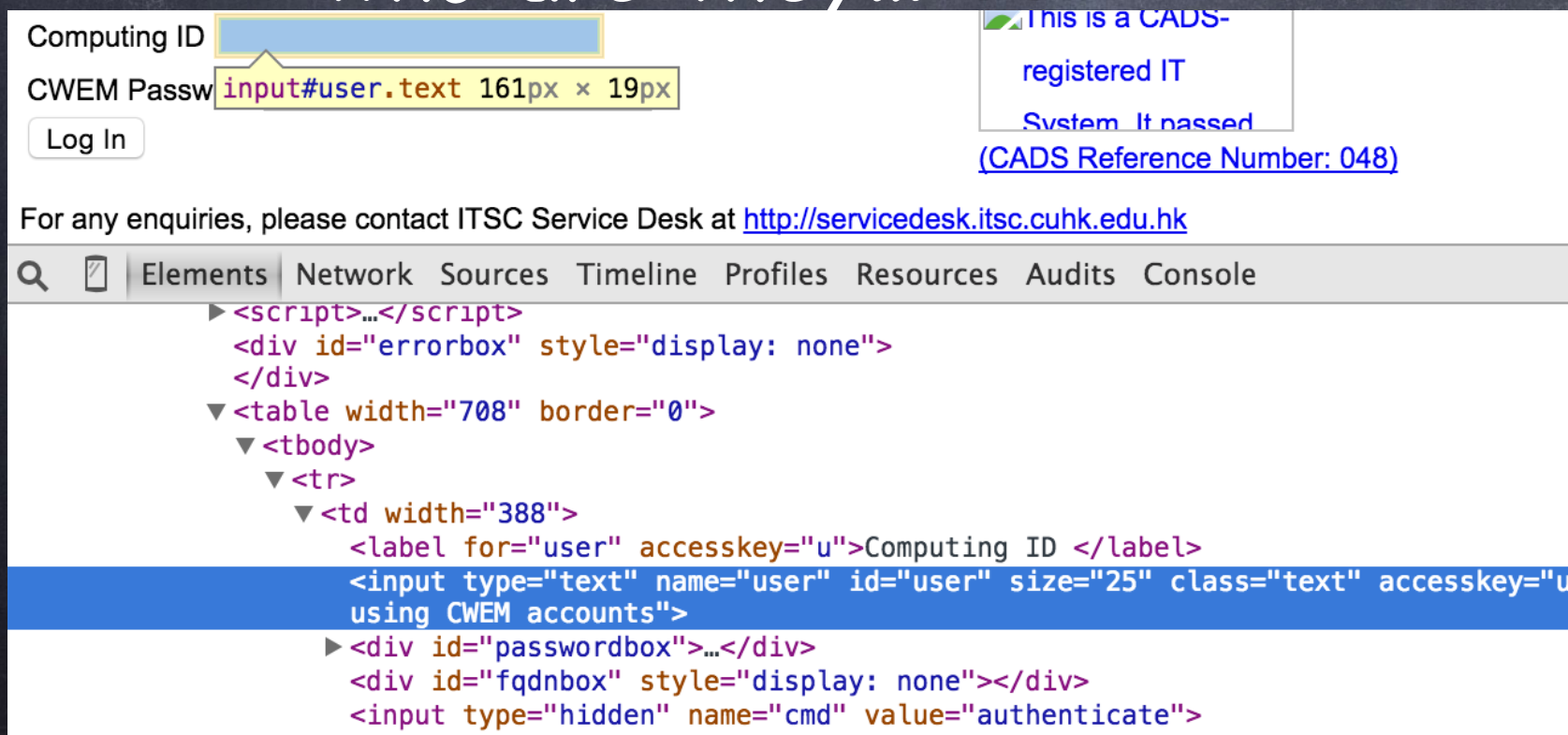
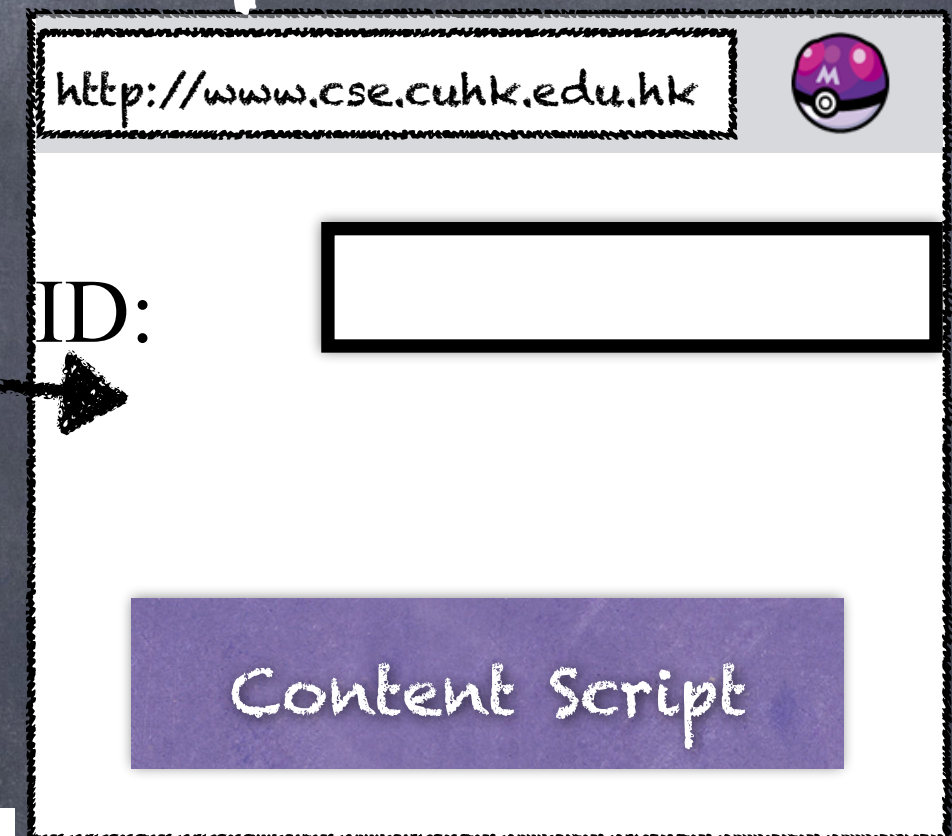
Need "tabs" permission here

```
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... 👁👁





# 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

How do I get the textbox and change the value?

```
<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 submit the form?



# Sample HTML

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

```
<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>
```

```
$("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



[\(CADS Reference Number: 048\)](#)

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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?

← → ↻ [https://securelogin.wlan.cuhk.edu.hk/upload/custom/CU\\_Portal/login.html?errormsg=Authentication%20failed](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.
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 webpage
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 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

"errorbox" div

Computing ID

CWEM Password

Log In



(CADS Reference Number: 048)

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



# Oops! How about error message?

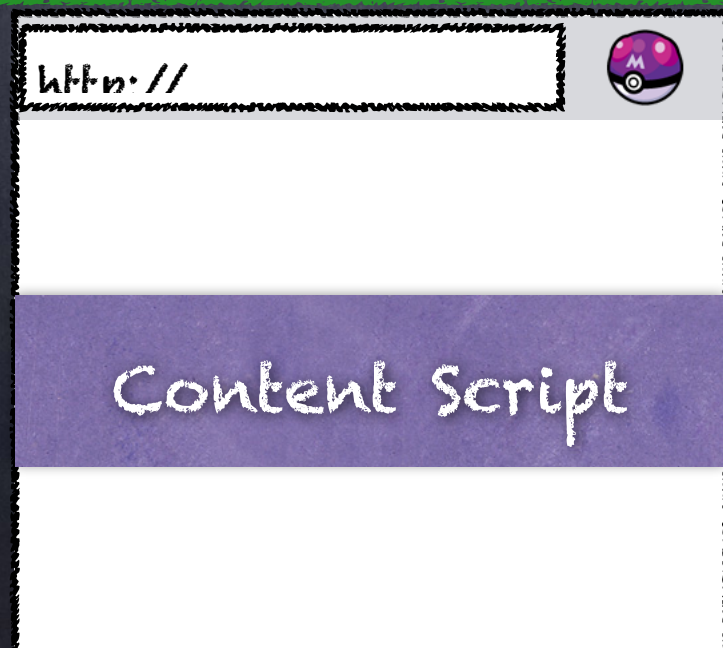
```
var url = window.location.href;
if(url.search("errmsg") == -1)
{
    // Fill In the form la
}
else
{
    if($("#errorbox").length) // Check if the error box div exists
    {
        // Need to tell Background page!
    }
}
```



# 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

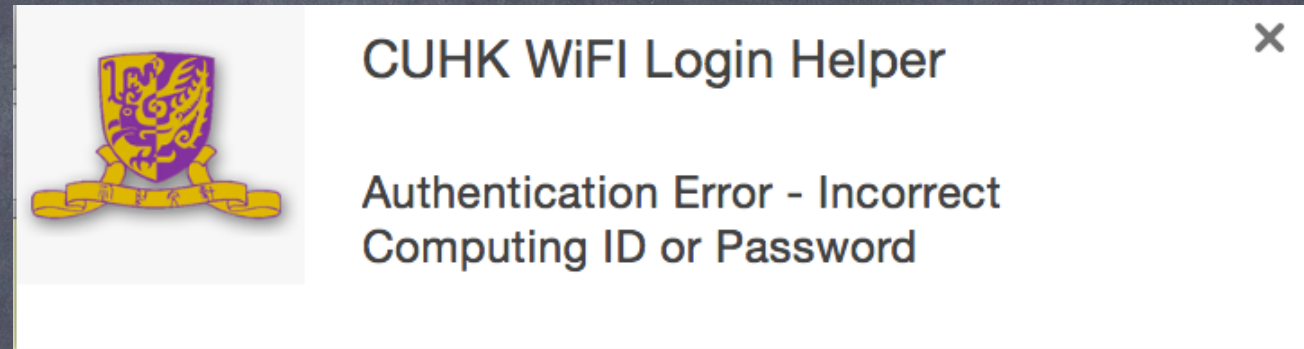
- In form of action listener....

```
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)



caivinkam123@gmail.com

Apps

Extensions

search



Unpacked

Load unpacked...



CUHK Login WiFi Login Tool 1.0

A Demo Extension for logging in to the CUHK Wifi

ID: klojjcdbmjejjmckomdobddafepffimn

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 ,

[View details](#)

[View details](#)

[View details](#)

[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: pakehkiclfmkkfddkkgjgdgabkkcidpj

Loaded from: /Users/Calvin/Documents/ChromeExt

☐ Enable

[Reload](#) [Permissions](#) [Behavior](#) [Pack](#) [Uninstall](#)

Chrome A...loper Tool



# -END-

We have learnt

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

Next Tutorial: Assignment 3

See You!