

CSCI4140 - Tutorial 11  
Assignment 3 Overview  
Simplified iReserve Bot

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2 Apr 2015

Errata: Slide15 changed



# Outline

- Demonstration of Assignment 3 Part I
- Chrome Storage
- OCR
- CheckList



# Demonstration

- Preliminary version only, more details to come!  
Stay tuned!



# "iReserve" Emulation Page

## Reserve and Pick Up

Email

Password

Captcha

e p G<sup>4</sup> 3 w

Continue





# "iReserve" Emulation Page

## Reserve and Pick Up

Email	<input type="text" value="Email"/>
Password	<input type="password" value="Password"/>
Captcha	<div>e p G<sup>4</sup> 3 w</div> <div></div>
	<div>Continue</div>

Email field and Password field





# "iReserve" Emulation Page

## Reserve and Pick Up

Email

Password

Captcha

e p G<sup>4</sup> 3 w

Continue

Captcha: Generated on-the-fly






# "iReserve" Emulation Page

- It contains 3 text fields: Email, Password, Captcha input.
- Your extension should be able to fill in them with stored data.
- No need to be implemented by yourself :P  
We will provide the code, link will be given later.



# Chrome Extension



The image shows a Chrome browser window with a login form. The form is titled "Login Details" and contains three sections: "Email", "Password", and "Captcha". Each section has a placeholder text and a corresponding input field. The "Email" field contains the text "hckam@cse.cuhk.edu.hk". The "Password" field contains the text "password" and a second field with six dots. The "Captcha" section has two input fields, one with the text "captcha" and another with the text "captchaText". At the bottom of the form are three buttons: "Save" (green), "Fill In" (blue), and "Close" (orange).

**Login Details**

**Email**

email

hckam@cse.cuhk.edu.hk

**Password**

password

.....

**Captcha**

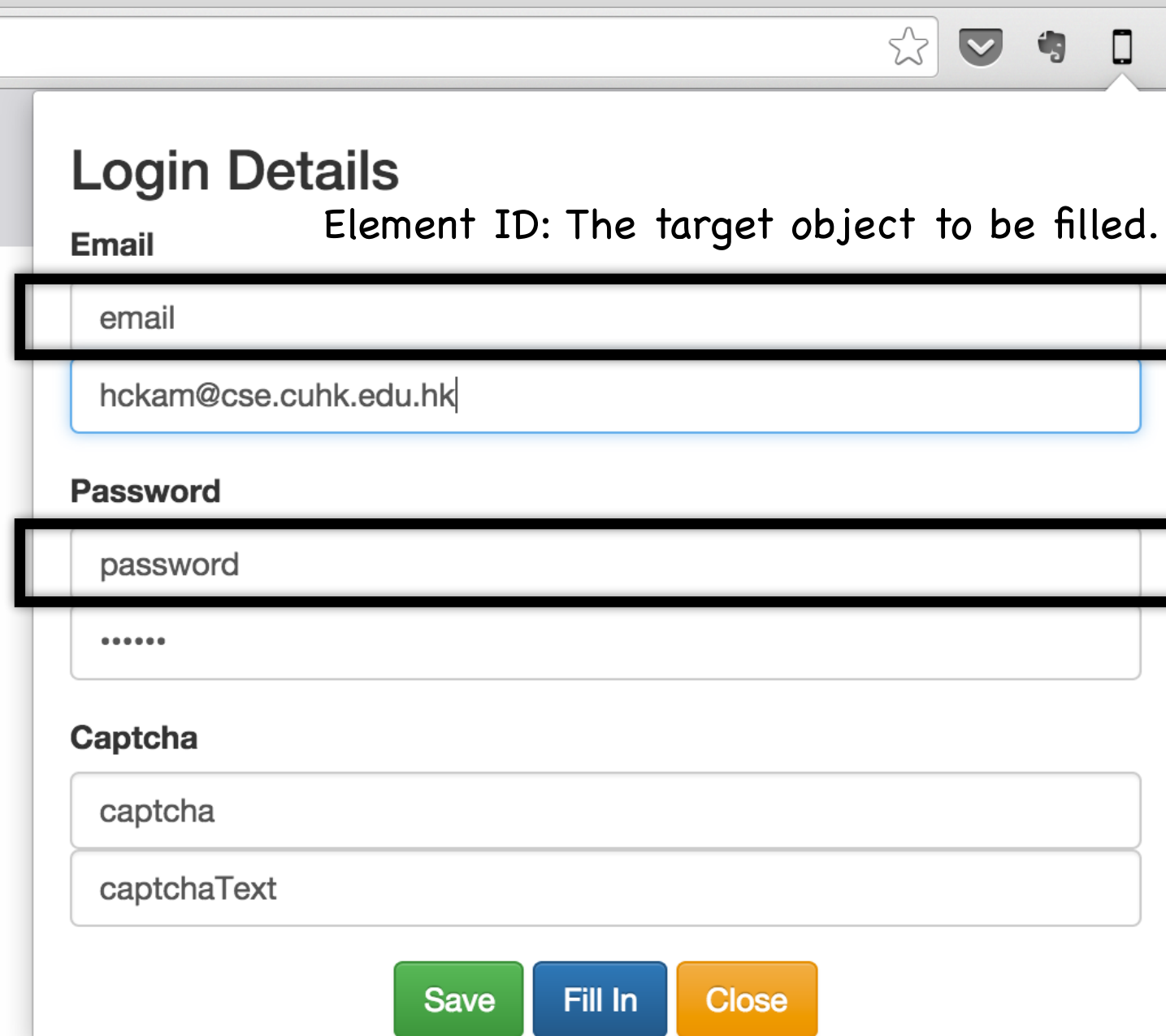
captcha

captchaText

**Save** **Fill In** **Close**



# Chrome Extension



**Login Details**

Email Element ID: The target object to be filled.

email

hckam@cse.cuhk.edu.hk

**Password**

password

.....

**Captcha**

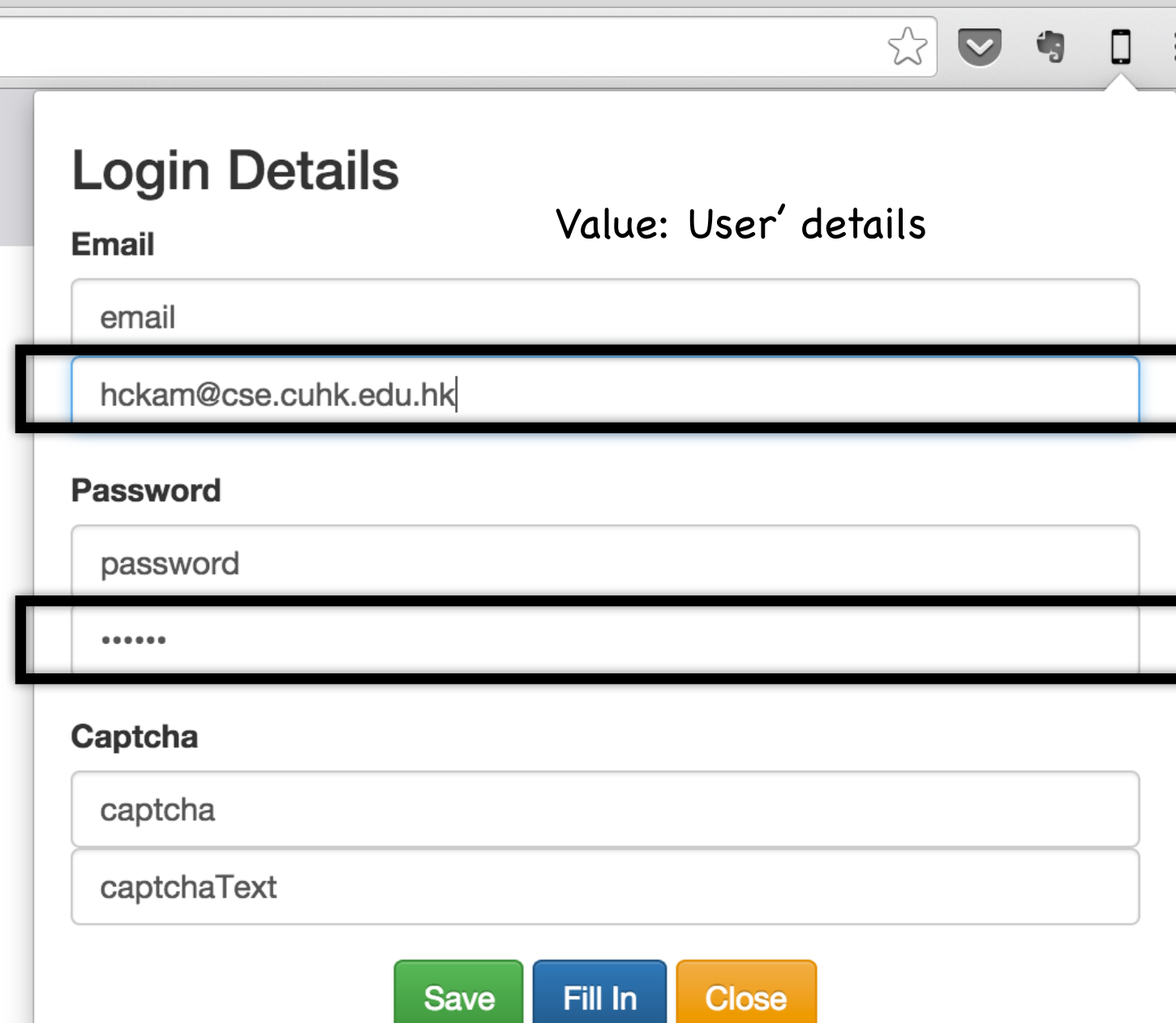
captcha

captchaText

Save Fill In Close



# Chrome Extension



The screenshot shows a web browser window with a Chrome extension interface. The extension is titled "Login Details" and displays a form for user authentication. The form includes fields for Email, Password, and a Captcha section. The Email field is pre-filled with "hckam@cse.cuhk.edu.hk" and is highlighted with a black border. The Password field is pre-filled with "password" and is also highlighted with a black border. The Captcha section contains two input fields labeled "captcha" and "captchaText". At the bottom of the form, there are three buttons: "Save" (green), "Fill In" (blue), and "Close" (orange). The browser's address bar and navigation icons are visible at the top of the window.

**Login Details**

Value: User' details

Email

email

hckam@cse.cuhk.edu.hk

Password

password

.....

**Captcha**

captcha

captchaText

Save Fill In Close



# Chrome Extension

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## Login Details

**Email**      Element ID: The target object to be filled.

email

hckam@cse.cuhk.edu.hk

**Password**

password

.....

**Captcha**

captcha	Captcha Picture ID
captchaText	Captcha Input TextField ID

Save   Fill In   Close



# Chrome Extension

**Login Details**

Element ID: The target object to be filled.

**Email**

email

hckam@cse.cuhk.edu.hk

**Password**

password

... Save & Fill in the form immediately

captcha

captchaText

Save Fill In Close

Annotations:

- Save & Fill in the form immediately (points to Fill In button)
- Saving to LocalStorage (points to Save button)
- Close the popup (points to Close button)



# Chrome Extension

- The extension should have a popup, allowing user to input the pre-filled information.
- There are two textfields for email and password, namely #ID and value.
- For captcha, two textfields are also required: one is for captcha picture #ID, another is for Captcha input #ID.



# Program Flow

- Load the Extension
- An icon appears next to the address bar, a popup page appears when it is clicked.
- When the iReserve page is loaded (reloaded), the content script will be injected automatically, i.e. form filling is done when the page finishes loading.
- Form filling can also be done without reloading by clicking the "Fill" button in the popup page.
- User details can be saved to local storage for later retrieval.



# Saving Data Locally in Chrome

- Chrome provides a handy tool to store user data, namely `storage.sync` and `storage.local`.
- `storage.sync` will allow Chrome to sync across each Chrome browser with user logged in.
- `storage.local` will store the data in local machine only. (In this case we will use it).



# storage.local

- Remember to set "Storage" permission!

```
"permissions": [  
    "activeTab",  
    "storage",  
    "tabs"  
],
```



# storage.local store values

```
chrome.storage.local.set({'key': "value", 'key2': "value2"},  
function(e){});
```

- It stores the data in a key-value pair manner.
- callback on success.



# storage.local get values

```
chrome.storage.local.get(null, function(e){  
  console.log(e["key"]);  
});
```

- The first parameter is to define which keys to retrieve (in String or array of string). If it is null, then all keys are retrieved.
- If on success, the value will be stored in parameter of callback function (e).



# Optical Character Recognition (OCR)

- To bypass the captcha, OCR is needed to recognise the characters 😈.
- In our chrome extension case, "OCRAD.js" is recommended.

## Ocrad.js Optical Character Recognition in JS

Ocrad.js is a **pure-javascript** version of the **Ocrad** project, automatically converted using **Emscripten**. It is a simple **OCR (Optical Character Recognition)** program that can convert scanned images of text back into text. Clocking in at **about a megabyte** of Javascript with no hefty training data dependencies (looking at you, **Tesseract**), it's on the lighter end of the spectrum.

This was made by [antimatter15](#) (please follow me on [Twitter](#) or [G+](#))



# Ocrad.js

- Include it in content script section at manifest  
`"js": ["ocrad.js", "action.js"],`
- Easy to use. Require only one sentence of code!!!  
(YEAH) `var string = OCRAD(image);`
- However, it only accepts a canvas element and a Context2D instance. That means it **does not accept img object!**
- We need to preprocess the captcha image..😞



# Preprocess the image for OCRAD.js

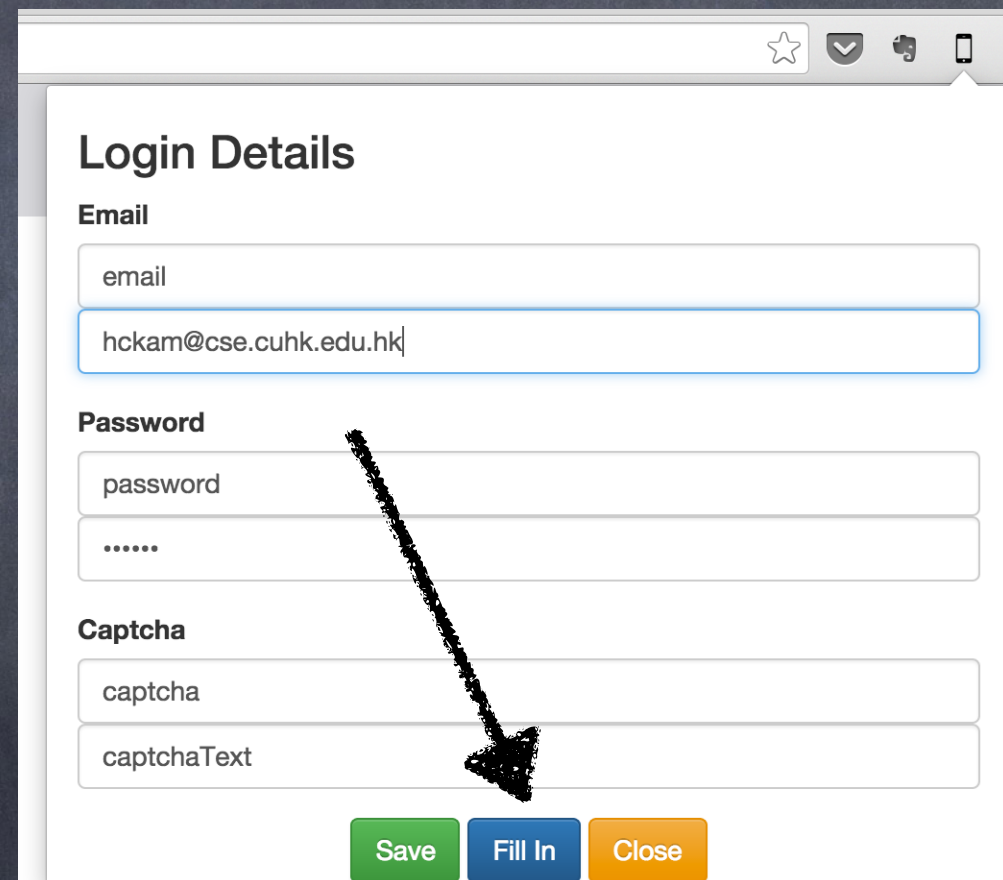
```
var image = new Image();
image.src = document.getElementById("image").src;
// Initialize a canvas
var canvas = document.createElement('canvas');
canvas.height = image.height;
canvas.width = image.width;
var imgDraw = canvas.getContext('2d');
imgDraw.drawImage(image,0,0);
var string = OCRAD(imgDraw);
```

- First a image object is created and make the source pointing the <img> object.
- Then the image will be drawn on canvas and it can be passed to OCRAD.js library!
- If the environment is hell-like (Open\_\_\_\_\_), how can we ensure the script runs after the image completely loaded? Use onload function of image.



# Message Passing from popup to content script

- If you want to send content script messages from the popup page like this:
- You need another function to do this:



The screenshot shows a web form titled "Login Details" within a browser window. The form contains three main sections: "Email", "Password", and "Captcha". The "Email" section has a text input field with the placeholder "email" and the value "hckam@cse.cuhk.edu.hk". The "Password" section has two text input fields, both with the placeholder "password"; the second field contains six dots. The "Captcha" section has two text input fields, both with the placeholder "captcha"; the second field contains the text "captchaText". At the bottom of the form are three buttons: "Save" (green), "Fill In" (blue), and "Close" (orange). A thick black arrow points from the second password field down to the "captchaText" field.



# Message Passing from popup to content script

```
chrome.tabs.query({active: true, currentWindow: true},  
function(tabs) {chrome.tabs.sendMessage(tabs[0].id,  
{key: "value"},function(response){});  
});
```

- This will find the current active tab and then get the id. This id is necessary to specify the recipient of the action : )
- The content script uses the normal listener to handle the message sending.
- Last Reminder: need "tabs" permission!



# CheckList

- How do I define a Chrome Extension? [Tut 1].
- How do I save data locally? [Tut 2].
- How do I access the DOM Object? [Tut 1].
- How do I manipulate the webpage object? [Tut 1].
- How do I recognize the character? [Tut 2].



# Reference

- <https://developer.chrome.com/extensions>
- <http://antimatter15.com/ocrad.js/demo.html>



# Thank You!

- Next Tutorial: Assignment 3 Part II.
- See You : )