CSCI4140 – Tutorial 11
Assignment 3 Overview
Simplified iReserve Bot

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Week 12

Errata: Slide15 changed

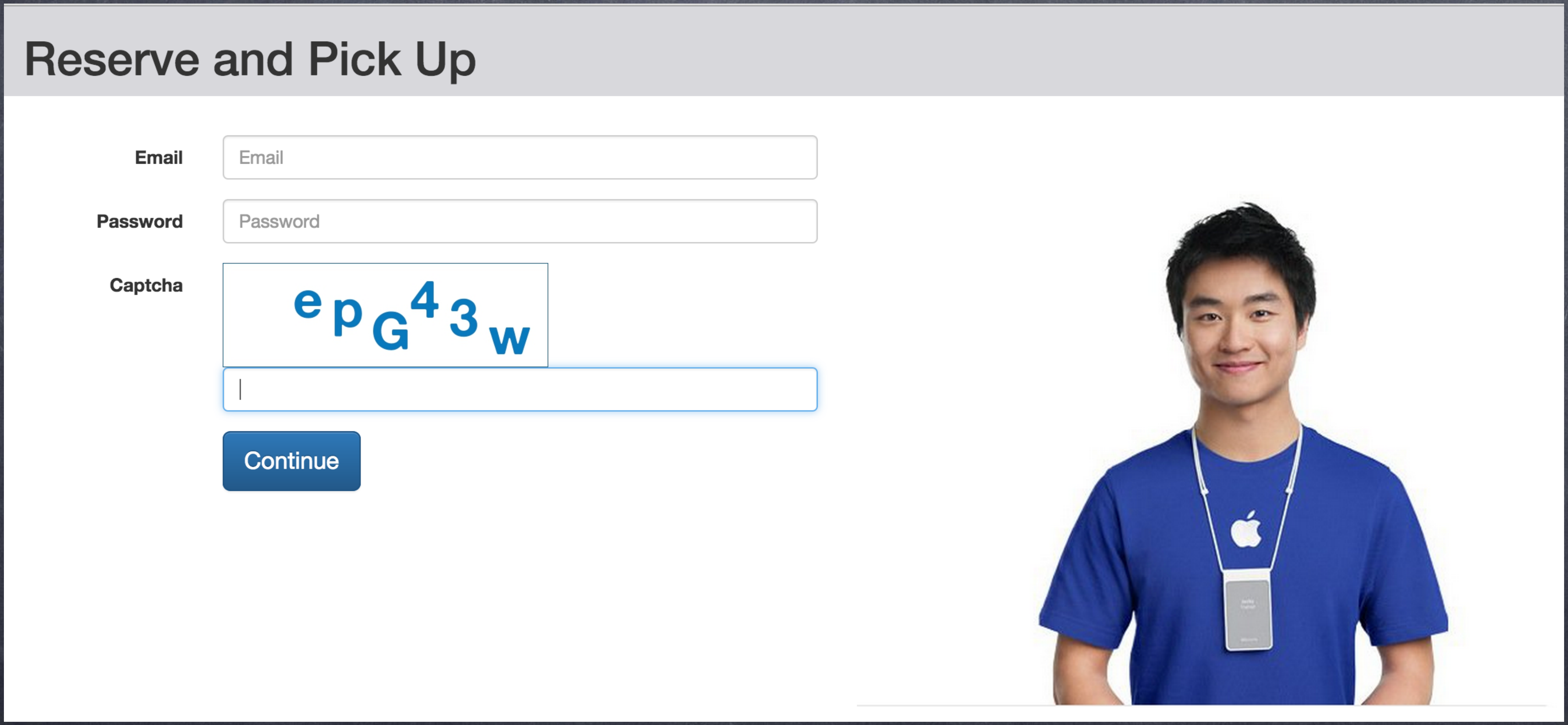
Outline

- Demonstration of Assignment 3 PartI
- Chrome Storage
- OCR
- CheckList

Demonstration

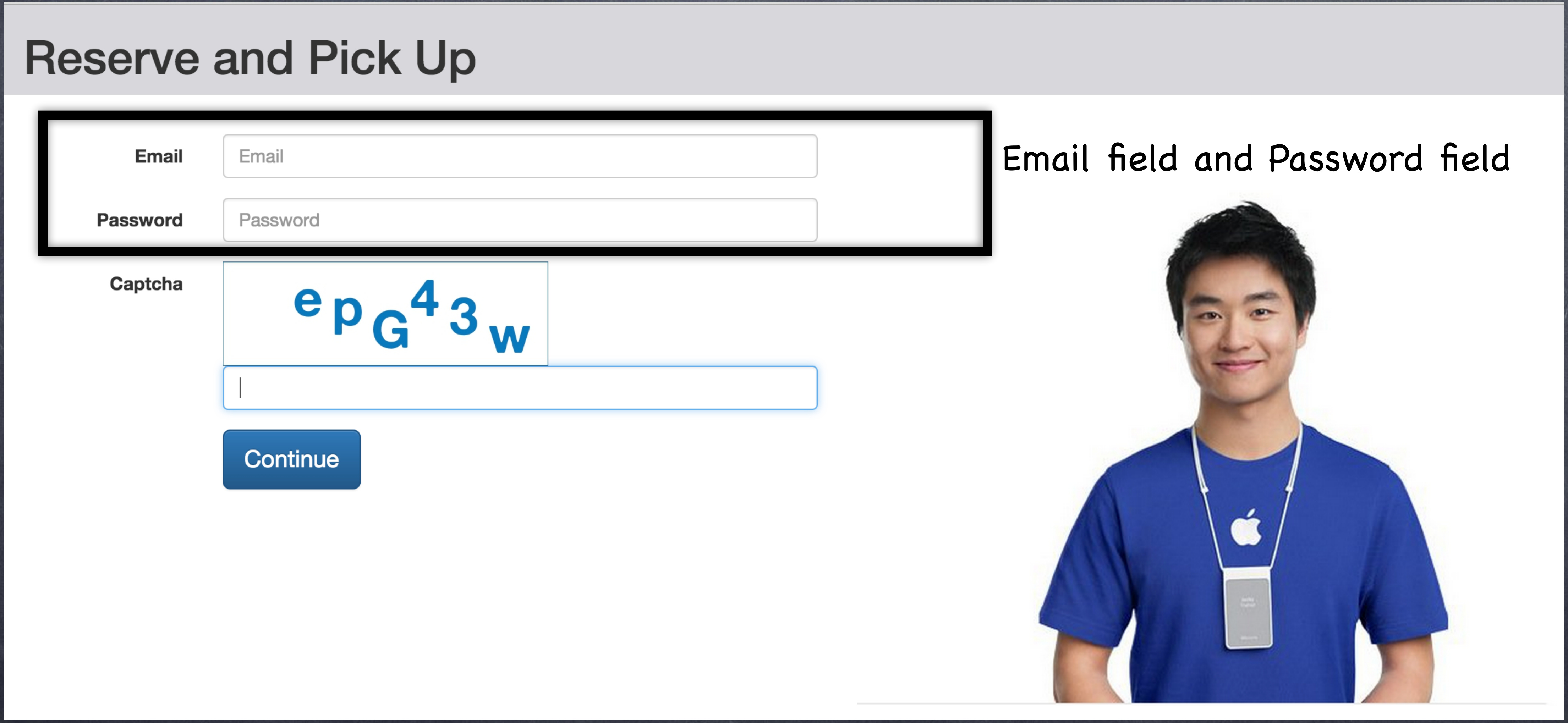
- Preliminary version only, more details to come! Stay tuned!

"iReserve" Emulation Page


Reserve and Pick Up

Email	Email
Password	Password
Captcha	epG43w

"iReserve" Emulation Page

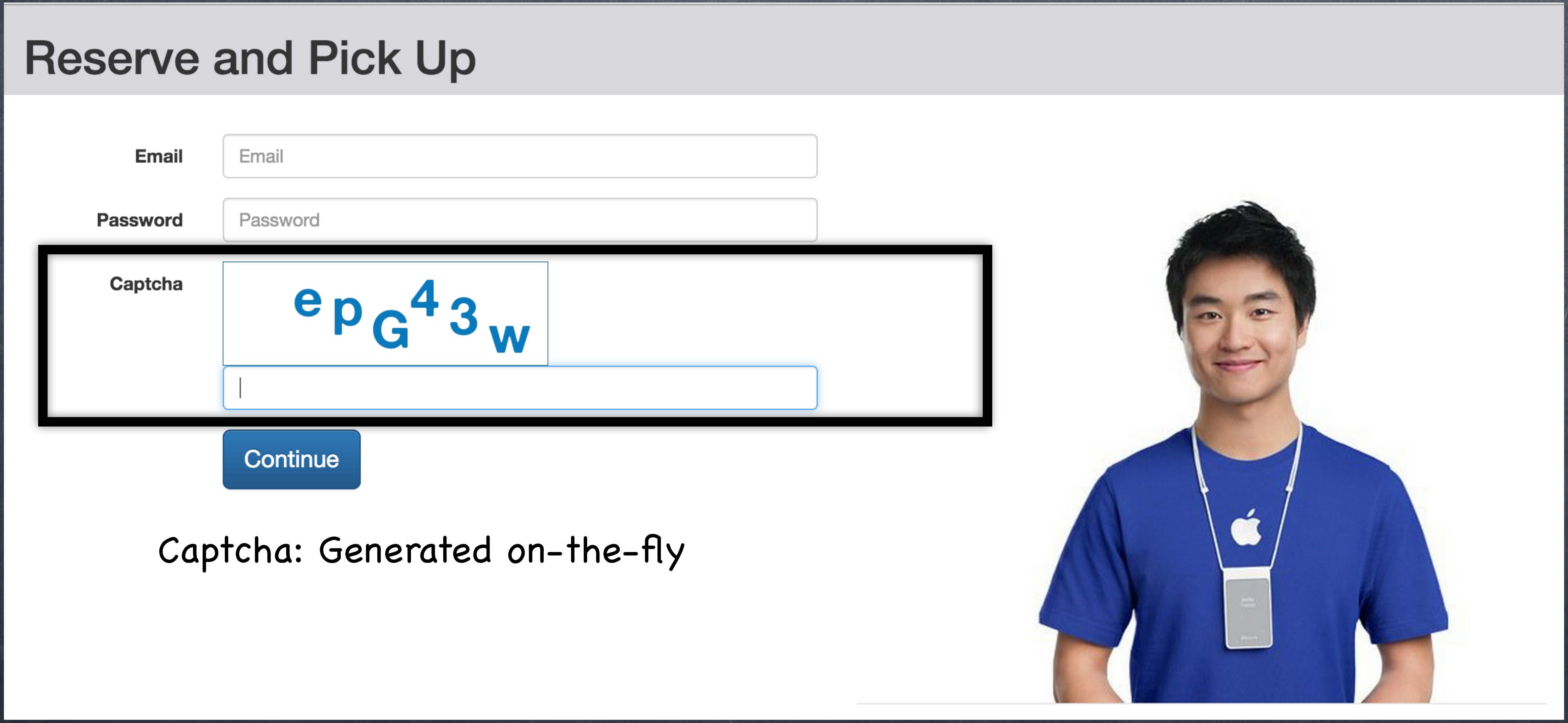


Reserve and Pick Up

Email	Email
Password	Password
Captcha	epG43w

Email field and Password field

"iReserve" Emulation Page


Reserve and Pick Up

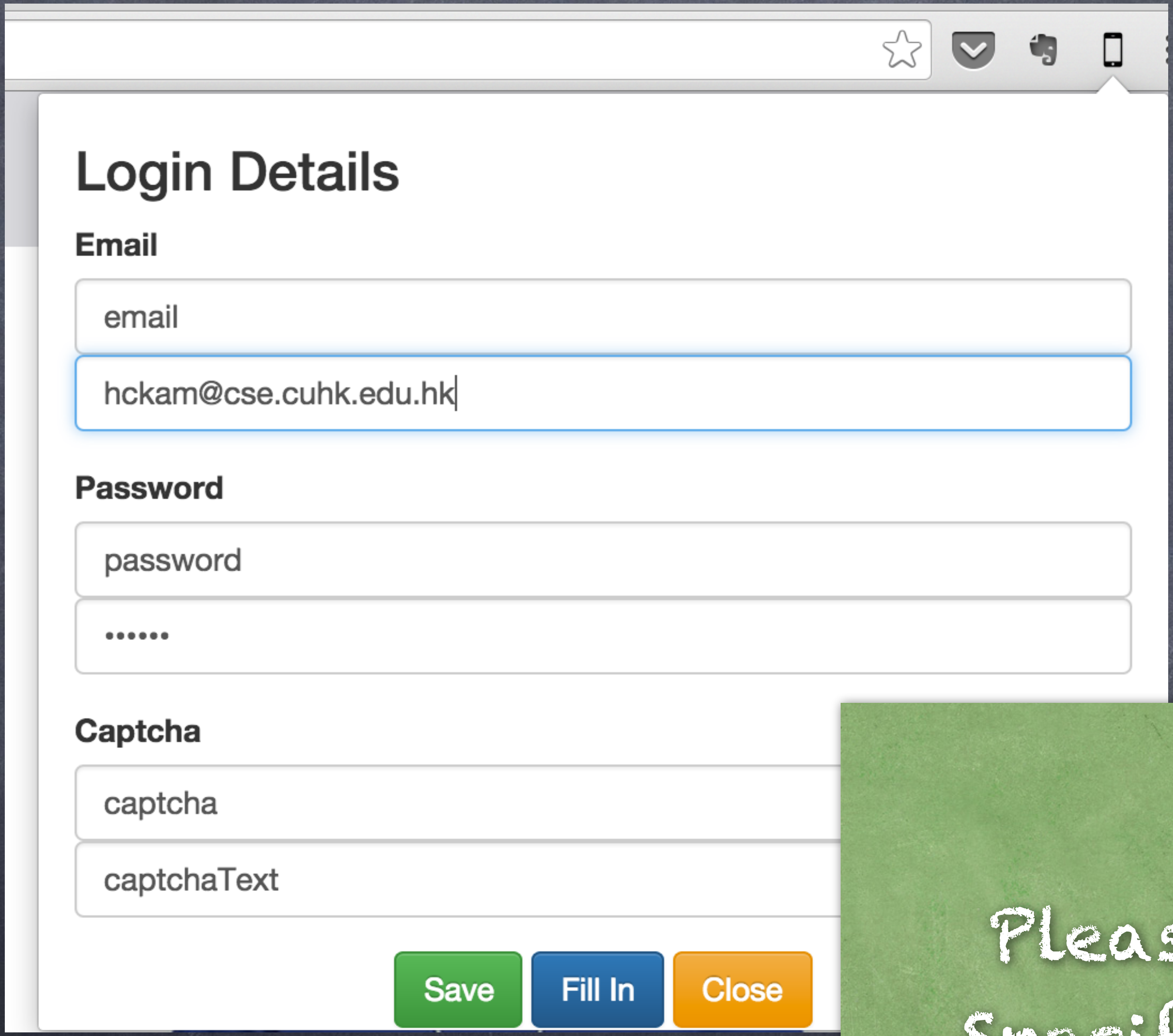
Email	Email
Password	Password
Captcha	epG43w

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


Login Details

Email

email

hckam@cse.cuhk.edu.hk

Password

password

••••••

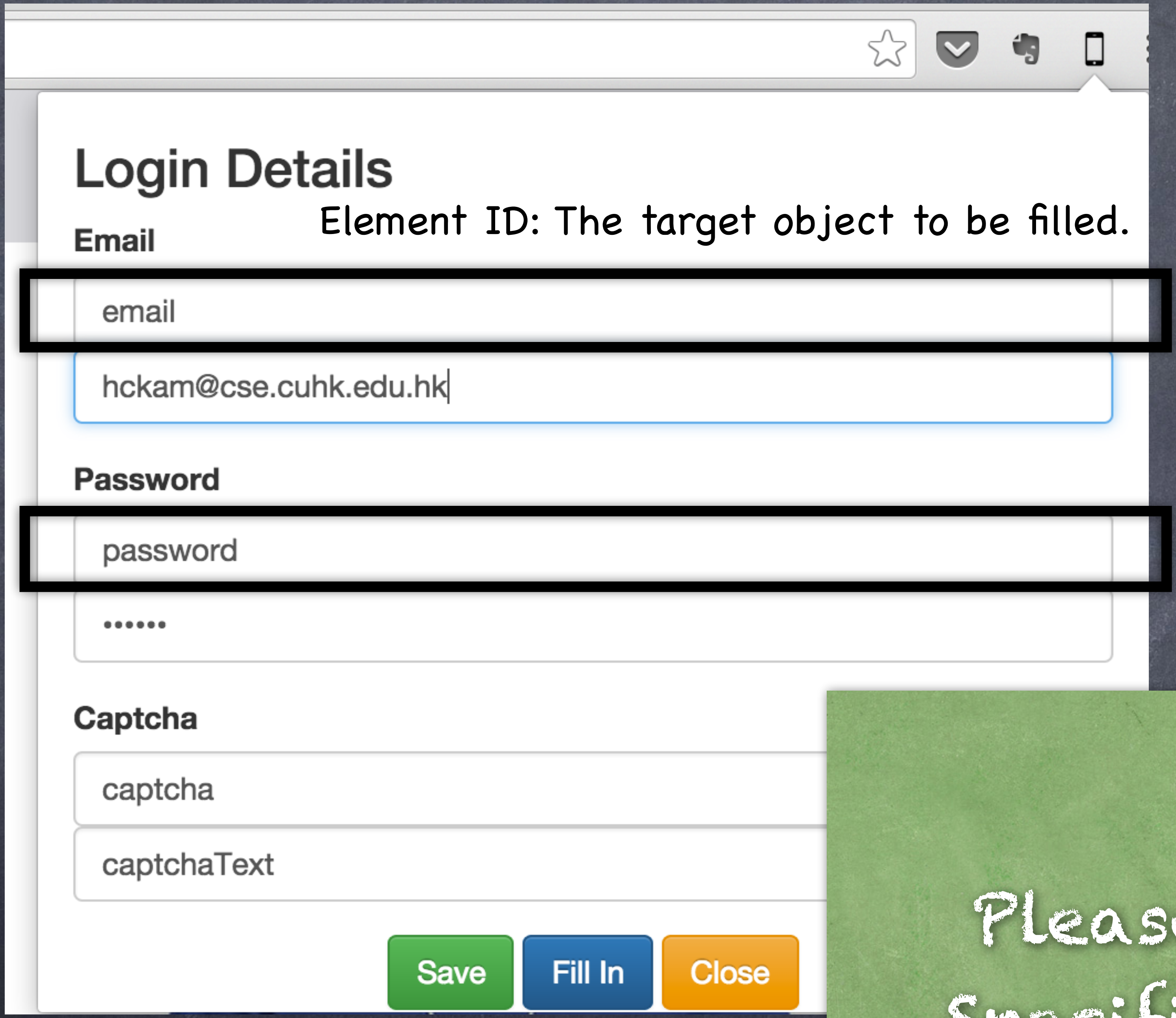
Captcha

captcha

captchaText

Please Refer to Specification for updated info.

Chrome Extension



Login Details

Element ID: The target object to be filled.

Email

email

hckam@cse.cuhk.edu.hk

Password

password

••••••

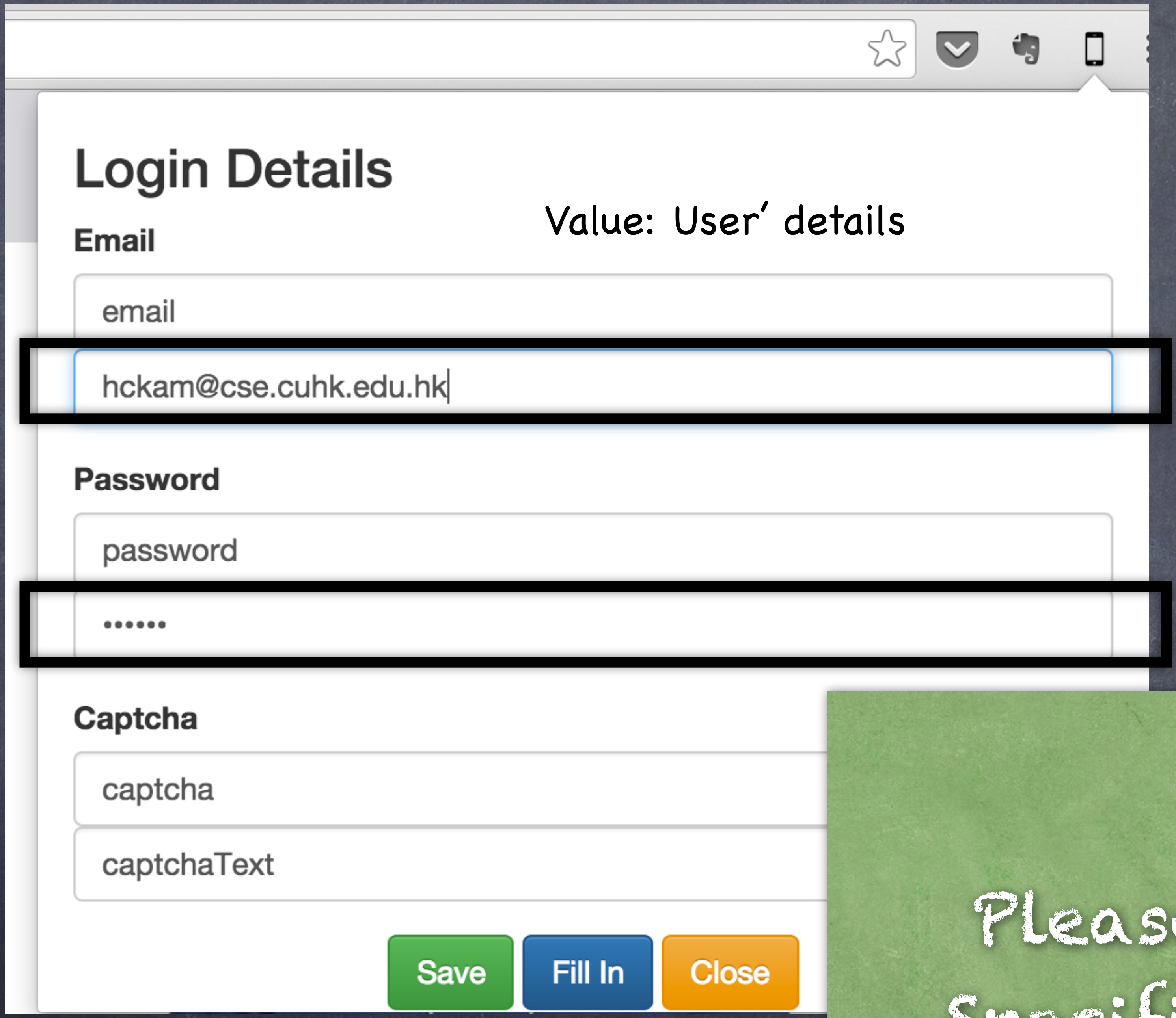
Captcha

captcha

captchaText

Please Refer to Specification for updated info.

Chrome Extension



Login Details

Value: User' details

Email

email

hckam@cse.cuhk.edu.hk

Password

password

••••••

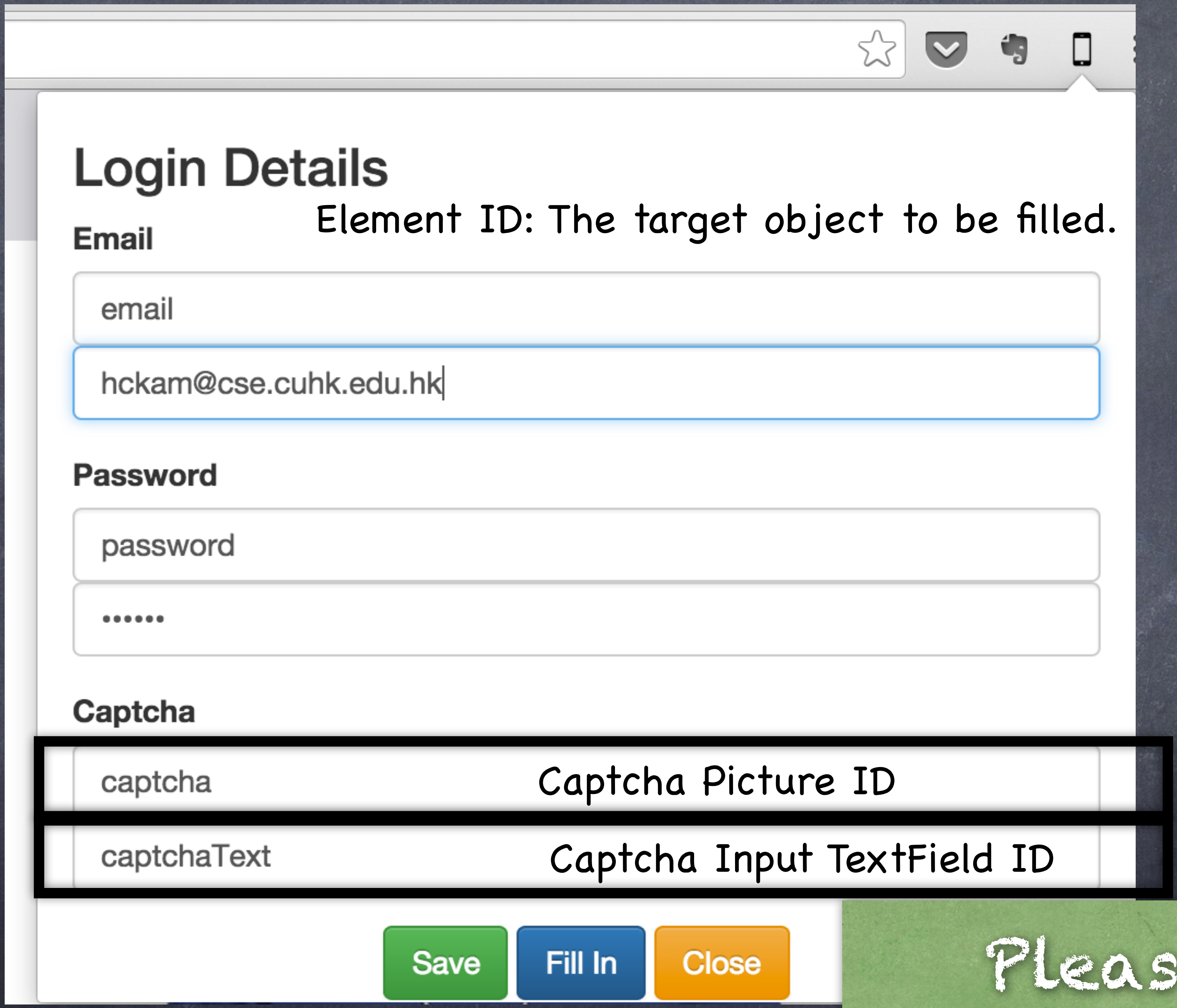
Captcha

captcha

captchaText

Please Refer to Specification for updated info.

Chrome Extension



Login Details

Element ID: The target object to be filled.

Email

email

hckam@cse.cuhk.edu.hk

Password

password

••••••

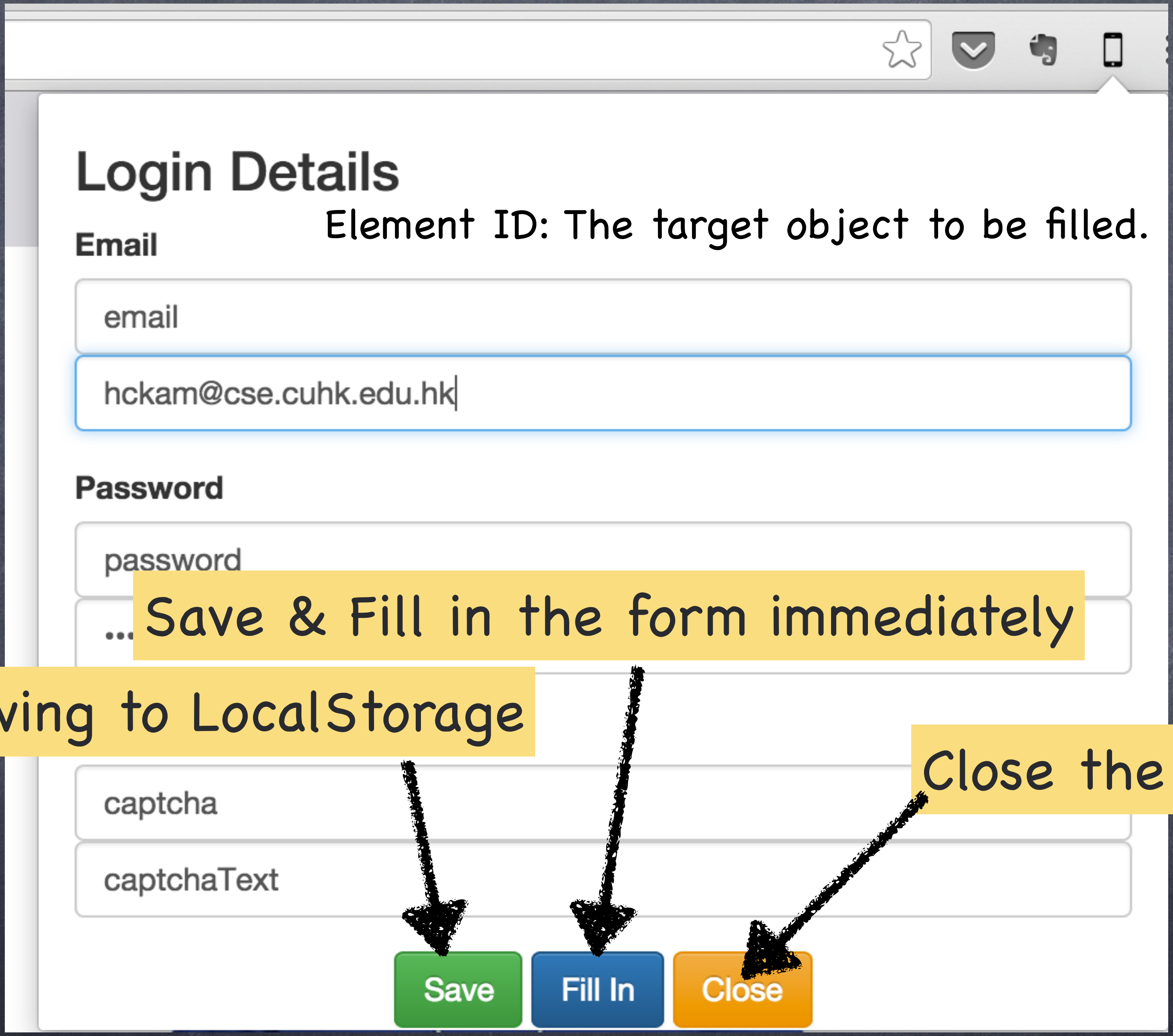
Captcha

captcha — Captcha Picture ID

captchaText — Captcha Input TextField ID

Please Refer to Specification for updated info.

Chrome Extension



Login Details

Email

email

hckam@cse.cuhk.edu.hk

Password

password

...

captcha

captchaText

Element ID: The target object to be filled.
Save & Fill in the form immediately
Saving to LocalStorage
Close the popup
Save
Fill In
Close

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.

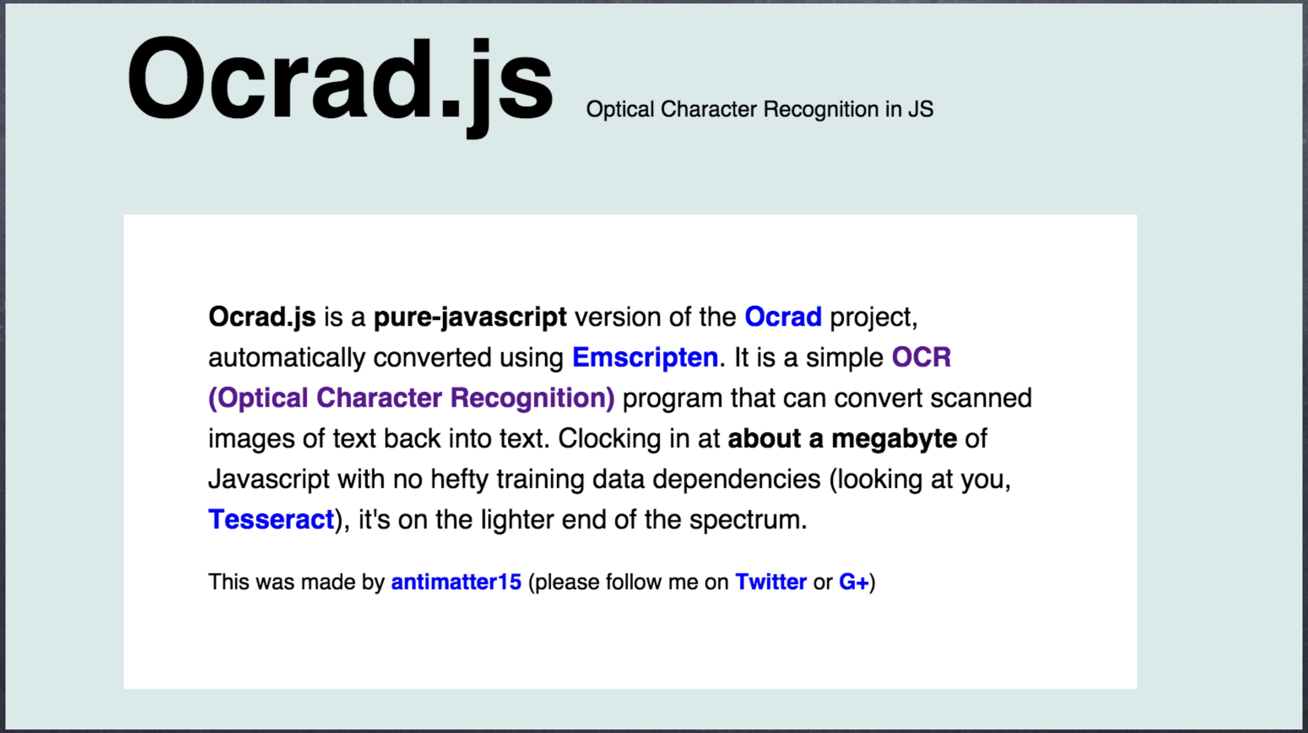
storage.local get values

```
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..😫

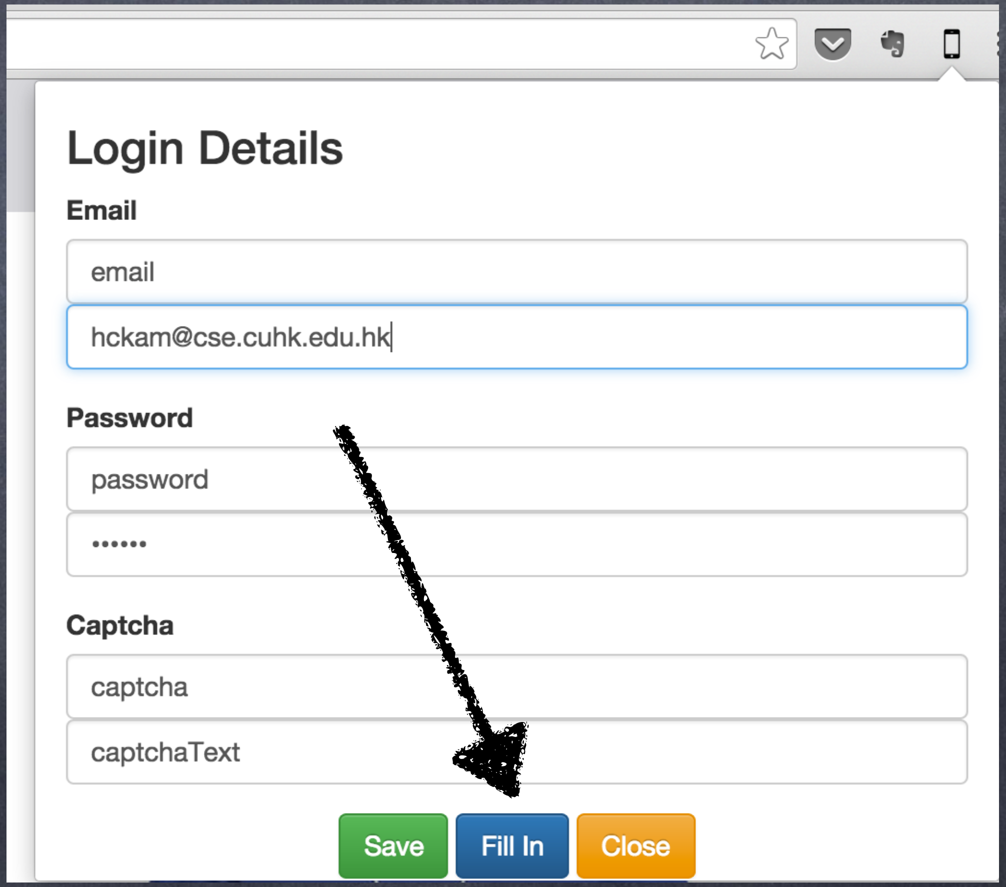
Preprocess the image for OCRAD.js

```
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:


Login Details

Email

email

hckam@cse.cuhk.edu.hk

Password

password

••••••

Captcha

captcha

captchaText

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 :)