ECS 189
Web Programming

5/26

Photobooth

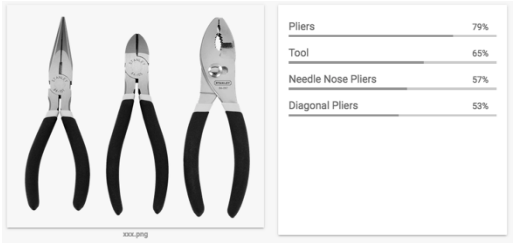
- Part 1 was hard; well done!
- Part 2:
  - Tuesday: Add automatic Google Cloud Vision labels, filtering by label.
  - Favorites are 2 points extra credit (buttons can do nothing otherwise).
  - 25 points total, comprehensive.
  - TAs will do interactive grading.
  - Can be handed in late, by midnight 6/7, for 2 points off.

Exams

- Midterm 6/2; TAs will proctor it
- I will email you random seat numbers the night before, to your ucdavis.edu address
- Will cover today's material

- If you are satisfied with your scores on the two midterms, you can skip the final
- As soon as your Photobooth and midterm are graded, I can give you your course grade (so far) so you can decide

Cloud Vision API – the magic



Google Web services

- The Cloud Vision API is one of many Google Web services
- To use it, you need a paying developer account on Google, and you'll need to set that up with a credit card
- Instructions on Web site with Part 2 instructions

	PRICE PER 1,000 UNITS, BY MONTHLY USAGE		
FEATURE	1 - 1,000 UNITS/MONTH	1001 - 5 MILLION UNITS/MONTH	5,000,001 - 20 MILLION UNITS/MONTH
Label Detection	Free	$1.50	$1.00

Lots of ways to use GCV API

- We'll use the very simplest
- Google issues you an API key (a code that identifies us)
- You include the API key in the URL of every GET or POST request you make:

```
url = 'https://vision.googleapis.com/v1/
  images:annotate?key=??????????????????';
```

What are the security issues?

What are the security issues?

- Someone snooping on the internet can see the API key, and make expensive GCV calls that get charged to your card
- Not clear it would be worth it to anyone…
- Google has several other authentication mechanisms that avoid this problem, which we will not use

Using the API

- Follows the usual 4-step plan
  - Make up request
  - Set up callback
  - Send off request
  - Handle result in callback
- But as usual has it's quirks

The HTTP request

- Use a POST request
- JSON in body gives information about request, and URL of image to analyze

```
HTTP POST
content-type: application/json
url: vision.googleapis.com/v1/
images:annotate?key=??????????????????';
```

```
{ "requests": [
  {"image": {
"source": {"imageUri":
http://138.68.25.50:????/hula.jpg}
  },
"features": [
{"type": "LABEL_DETECTION" }]  } ]}
```

Node request function

- To build a server HTTP request using Node, the usual way is to use the node request module

  npm request

- This gives us the request function
- The functionality here is exactly the same as using the XMLHttpRequest object in the browser, but because this is the Web everything looks different…

Where are the four parts?

```
request( {
  url: url,
  method: "POST",
  headers: {"content-type": "application/json"}
  json: requestObject },
      // second operand is callback
  APIcallback );
```

Callback function

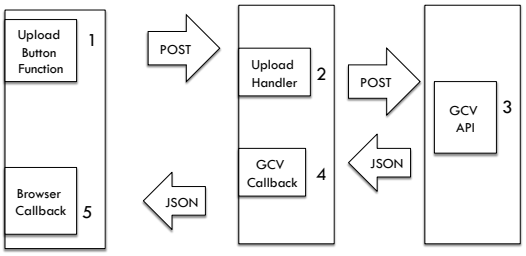
```
function APIcallback(err, APIresponse, body) {
  if ((err) || (APIresponse.statusCode != 200)) {
      console.log("Got API error");
  } else {
      APIresponseJSON = body.responses[0];
      console.log(APIresponseJSON);
}}
```

Example response

```
{ labelAnnotations:  [
  { mid: '/m/026bk', description: 'dance', score: 0.8921945 },
  { mid: '/m/05qjc', description: 'performing arts', score: 0.87477195 },
  { mid: '/m/06ntj', description: 'sports', score: 0.7928343 },
  { mid: '/m/02jjt', description: 'entertainment', score: 0.7739482 },
  { mid: '/m/02_5v2', description: 'quinceañera', score: 0.70231736 }
] }
```

How should we use this?

How should we use this?



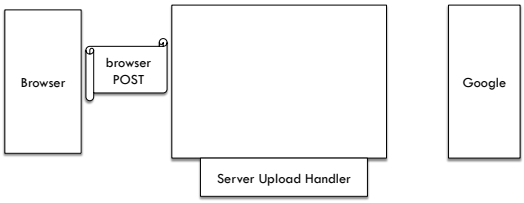
How should we use this?

- Request to GCV goes in Step 3 of this sequence
- Photo upload handler function in server (case 3 in tripleThreatServer)
  - Be sure to put it after the image is fully uploaded (in the form.on('end', function() { ….) function
  - Why?
- Callback for GCV goes where?

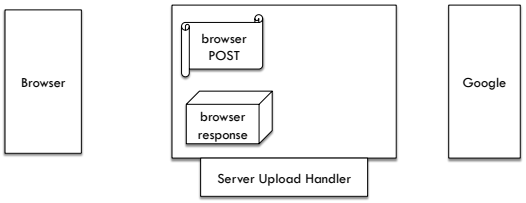
How should we use this?

- Request to GCV goes in Step 3 of this sequence
- Photo upload handler function in server (case 3 in tripleThreatServer)
  - Be sure to put it after the image is fully uploaded (in the form.on('end', function() { ….) function
  - Why?
- Callback for GCV goes where?
- Also in the upload handler function, since it needs to send a response back to browser; it needs the other response object for the browser's POST request!

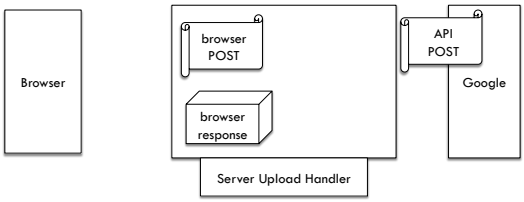
Flow of operations



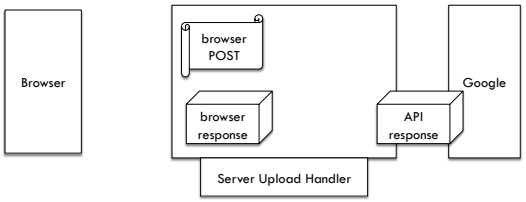
Flow of operations



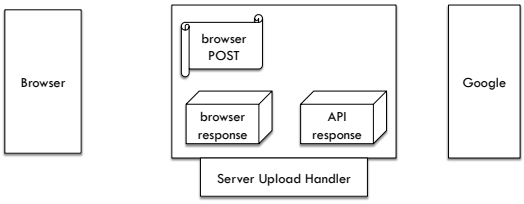
Flow of operations



Flow of operations

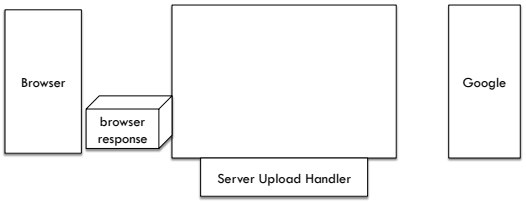


Warning! TWO response objects



- Make sure they have two different, descriptive names, such as browserResponse and APIresponse

Flow of operations



What to do on the browser side?

What to do on the browser side?

- Get browser response, extract labels
- Make image source be server URL, display un-faded
- Show labels
- Add onclick function to hamburger, deletion x's

Faking it when not needed

- If you're worried about racking up costs, we can have the function calling the API fake it when not needed
- Make a global Booelan variable "LIVE"
- When true, do real call with real callback

Fake call

```
if (LIVE) {
   …
} else {
   setTimeout(fakeAPIcallback, 2000);
}
```

- setTimeout() sets a callback that will be called in 2000 ms (2 seconds)
- fakeAPIcallback displays fake data in correct format

It's all downhill from there!