Digital Solutions 2019 v1.2

IA3 mid-level annotated sample response

March 2020

Project — folio (25%)

This sample has been compiled by the QCAA to assist and support teachers to match evidence in student responses to the characteristics described in the instrument-specific marking guide (ISMG).

Assessment objectives

This assessment instrument is used to determine student achievement in the following objectives:

1. recognise and describe key elements of an application, components of data exchange systems, and data security processes
2. symbolise and explain data interface, structures and specifications; data flow relationships within and between systems; and digital methods of exchanging data
3. analyse a data exchange problem and information related to data security
4. determine data exchange system requirements, a security strategy for data, and prescribed and self-determined criteria
5. synthesise information and ideas to determine selected data, algorithms and coded components of data exchange solutions
6. generate components of the data exchange solution
7. evaluate impacts, coded components and a data exchange solution against prescribed and self-determined criteria to make refinements and justified recommendations
8. make decisions about and use mode-appropriate features, written language and conventions for a technical audience.

Queensland Government
Queensland Curriculum & Assessment Authority
200184
For all Queensland schools

Instrument-specific marking guide (ISMG)

Criterion: Retrieving and comprehending

Assessment objectives

1. recognise and describe key elements of an application, components of data exchange systems, and data security processes
2. symbolise and explain data interface, structures and specifications; data flow relationships within and between systems; and digital methods of exchanging data

The student work has the following characteristics:	Marks
• accurate and discriminating recognition and discerning description of key elements of an application, components of data exchange systems, and data security processes • adept symbolisation and discerning explanation of data interface, structures and specifications; data flow relationships within and between systems; and digital methods of exchanging data.	5–6
• appropriate recognition and description of key elements of an application, components of data exchange systems, and data security processes • competent symbolisation and appropriate explanation of data interface, structures and specifications; data flow relationships within and between systems; and digital methods of exchanging data.	3–4
• variable recognition and superficial description of elements of an application, components of data exchange systems, or data security processes • variable symbolisation and superficial explanation of aspects of data interface, data flow relationships or digital methods of exchanging data.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Analysing

Assessment objectives

3. analyse a data exchange problem and information related to data security
4. determine data exchange system requirements, a security strategy for data, and prescribed and self-determined criteria

The student work has the following characteristics:	Marks
• insightful analysis of the data exchange problem and relevant information related to data security to identify the data structures, data exchange methods, risks to data and code components • astute determination of data exchange requirements, security strategy for data, code for the data conversion program and essential prescribed and self-determined criteria.	6–7
• considered analysis of the data exchange problem and relevant information related to data security to identify the data structures, data exchange methods, risks to data and code components • logical determination of data exchange requirements, security strategy for data, code for the data conversion program and effective prescribed and self-determined criteria.	4–5
• appropriate analysis of the data exchange problem and information related to data security to identify the data structures, data exchange methods, risks to data and code components • reasonable determination of data exchange requirements, security strategy for data or code for the data conversion program and some criteria.	2–3
• makes statements about aspects of the data exchange problem, data structures, data exchange methods, risks to data or code components • vague determination of some data exchange requirements, security strategy for data and some criteria.	1
• does not satisfy any of the descriptors above.	0

Criterion: Synthesising and evaluating

Assessment objectives

5. synthesise information and ideas to determine selected data, algorithms and coded components of data exchange solutions
6. generate components of the data exchange solution
7. evaluate impacts, coded components and a data exchange solution against prescribed and self-determined criteria to make refinements and justified recommendations

The student work has the following characteristics:	Marks
• coherent and logical synthesis of relevant information and ideas to determine selected data, algorithms and coded components of data exchange solutions • purposeful generation of efficient components of the data exchange solution • critical evaluation of impacts, coded components and a data exchange solution against essential prescribed and self-determined criteria to make discerning refinements of code and astute recommendations justified by data.	7–8
• logical synthesis of relevant information and ideas to determine data, algorithms and coded components of data exchange solutions • effective generation of components of a data exchange solution • reasoned evaluation of impacts, coded components and the digital data exchange solution against effective criteria to make effective refinements of code and considered recommendations justified by data.	5–6
• simple synthesis of information or ideas to determine data, algorithms and coded components of data exchange solutions • adequate generation of components of the data exchange solution • feasible evaluation of impacts, coded components and a digital data exchange solution against some criteria to make adequate refinements of code and fundamental recommendations justified by data.	3–4
• unclear combinations of information or ideas to determine data, algorithms or coded components of data exchange solutions • superficial evaluation of impacts, or the digital data exchange solution, against criteria.	1–2
• does not satisfy any of the descriptors above.	0

Criterion: Communicating

Assessment objectives

8. make decisions about and use mode-appropriate features, written language and conventions for a technical audience

The student work has the following characteristics:	Marks
• discerning decision-making about, and fluent use of - written and visual features to communicate about a solution - language for a technical audience - grammatically accurate language structures - referencing and project conventions.	3–4
• variable decision-making about, and inconsistent use of - written and visual features - suitable language - grammar and language structures - referencing or project conventions.	1–2
• does not satisfy any of the descriptors above.	0

Task

Context

We live in a connected world that is increasingly embracing technologies, which enable real-time data to be collected and exchanged across interconnected devices and systems. Understanding and developing methods of securing data exchange between computer systems is extremely important for privacy.

Federal, state and local government departments across Australia are adopting open data policies and increasingly provide access to, and encourage use of, open (publicly accessible) datasets. Open datasets, wearable technology, telemetry, smart homes, sensors, and augmented and virtual reality are being used across a variety of sectors to continuously monitor and track data and human activity.

Governments encourage use of open datasets through competitions known as GovHacks, which involve developing innovative solutions that solve problems and create better outcomes for local communities. Small teams are formed and given access to thousands of open datasets, which they then 'mash' together to create web, mobile or augmented reality applications, as well as 3D printed visualisations. Each team creates a project page, proof of concept and a video explaining how the government data can be used.

Brisbane City Council, for example, has an open data portal that is accessible to the public, which contains data on people of all ages.

Task

Read the technical proposal (stimulus material) and then present a proof of concept for a new web application for young people.

The new web application must provide:

- young people with a platform to connect with friends and acquaintances
- information about available community support services.

Document use of the Digital Solutions problem-solving process in responding to the problem and generate a component of the data exchange solution.

The technical proposal provides further details about requirements for the new web application.

Sample response

Criterion	Marks allocated	Result
Retrieving and comprehending Assessment objectives 1, 2	6	3
Analysing Assessment objectives 3, 4	7	4
Synthesising and evaluating Assessment objectives 5, 6, 7	8	4
Communicating Assessment objective 8	4	2
Total	**25**	**13**

The annotations show the match to the instrument-specific marking guide (ISMG) performance-level descriptors.

This is the student's title page and it is not included in the page count.

Digital Solutions

Unit 4: Digital Impacts – Summative Internal Assessment 3

Analysing [4–5]

considered analysis of the data exchange problem and relevant information related to data security to identify the data exchange methods, risks to data and code components

Retrieving and comprehending [3–4]

appropriate recognition and description of key elements of an application, components of data exchange systems

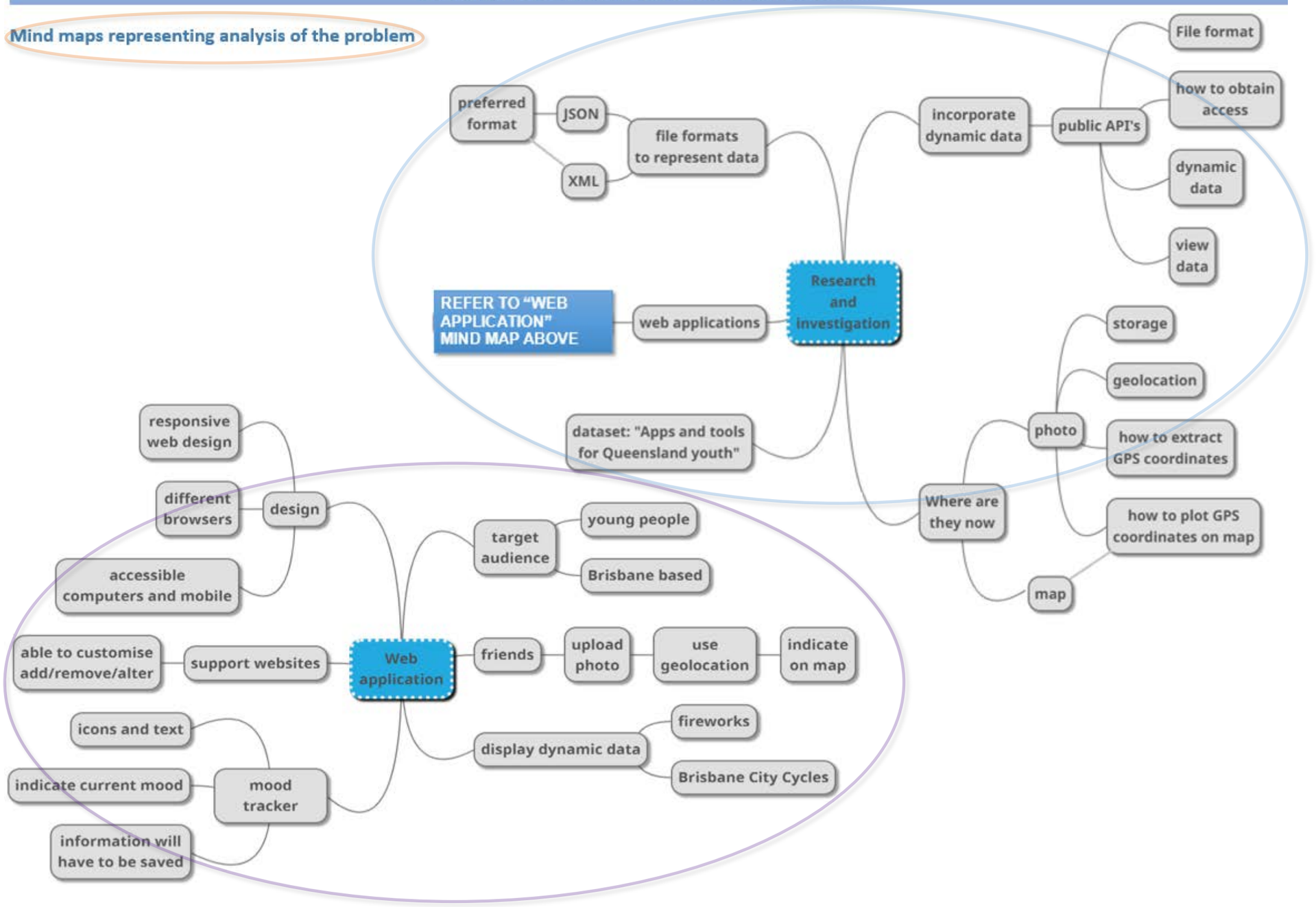
Communicating [3–4]

discerning
decision-making about, and fluent use of written and visual features to communicate about a solution

Part 1 – Research and Investigation

Description of web application and data requirements

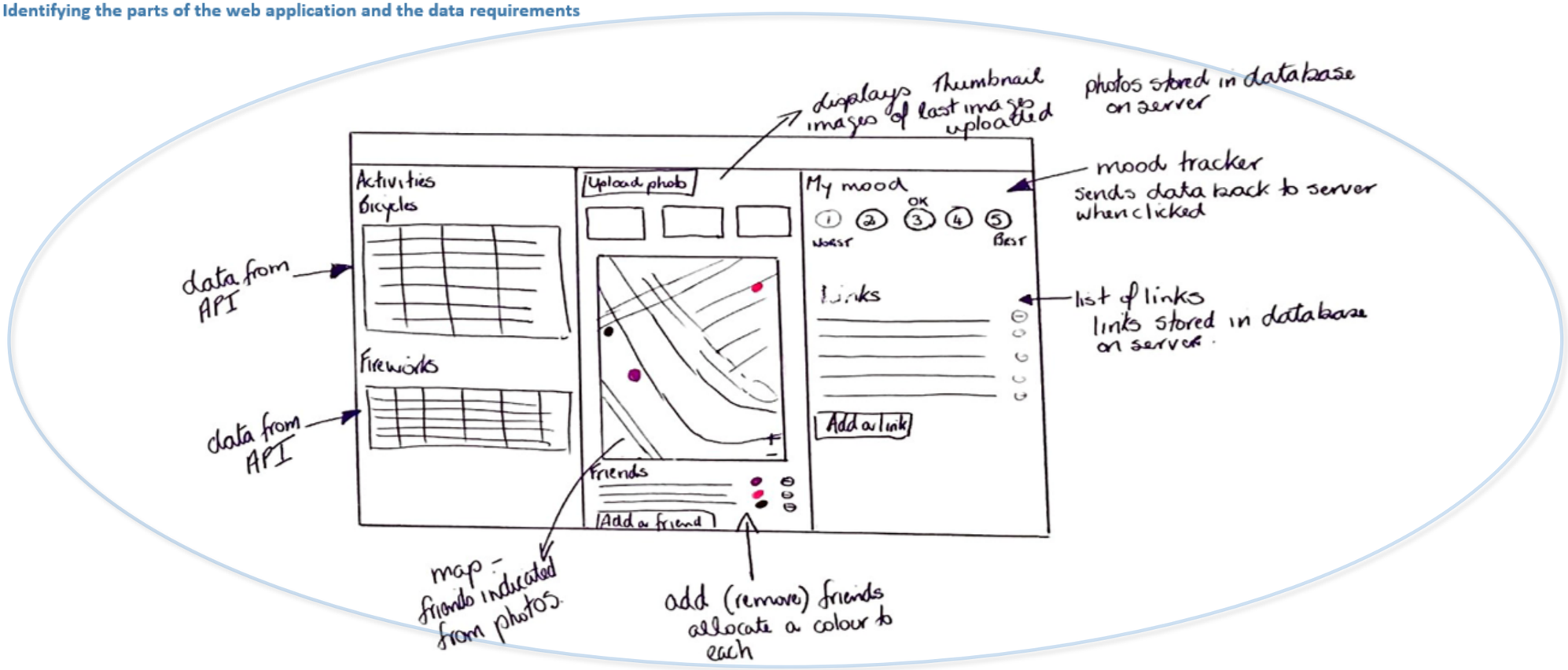
Mind maps representing analysis of the problem



Retrieving and comprehending [3–4]

appropriate recognition and description of key elements of an application

Identifying the parts of the web application and the data requirements



Methods for exchanging data

Analysing [4–5]

appropriate analysis of the data exchange problem and information related to data security to identify the data structures

logical determination of data exchange requirements, security strategy for data, code for the data conversion program

Analysis of XML and JSON

XML	JSON
eXtensible Markup Language	JSON stands for: JavaScript Object Notation
XML looks like this: <employees> <employee> <firstName>John</firstName> <lastName>Doe</lastName> </employee> <employee> <firstName>Anna</firstName> <lastName>Smith</lastName> </employee> <employee> <firstName>Peter</firstName> <lastName>Jones</lastName> </employee> </employees> (W3schools.com, 2017)	JSON data looks like this: {"employees":[{ "firstName":"John", "lastName":"Doe" }, { "firstName":"Anna", "lastName":"Smith" }, { "firstName":"Peter", "lastName":"Jones" }]} (W3schools.com, 2017)

Retrieving and comprehending [3–4]

appropriate recognition and description of key elements of data security processes

competent symbolisation and appropriate explanation of digital methods of exchanging data

Analysing [4–5]

considered analysis of the data exchange problem and relevant information related to data security to identify the data exchange methods

logical determination of data exchange requirements, security strategy for data

XML	JSON
It only uses text to describe and store the data. In the example above, it says that John Doe, Anna Smith, and Peter Jones are all employees.	You can only use text data with JSON. The above examples says exactly the same as the XML example: John Doe, Anna Smith, and Peter Jones are employees.
• It's like HTML. • It uses < and > of HTML to store elements in. In the example above employee is an element. • There isn't a set of pre-existing elements, you get to decide what the elements of the XML file will be.	• JSON data is made up of names and values eg: "firstName" would be the name, and "John" would be its pair. • Double quotes have to be used around each and a colon is used to separate the name and value eg. "firstName": "John" • It uses curly bracket { }.
XML is not as concise as JSON data.	JSON is considered to be better than XML because it's faster and easier to use. (W3schools.com, 2017)
	Most new APIs use REST and JSON.

Analysis of data sets

The two datasets to be used are: Upcoming fireworks displays: data.qld.gov.au/dataset/fireworks_ and Brisbane CityCycle API: www.data.brisbane.qld.gov.au/data/dataset/citycycle

Upcoming fireworks displays: data.qld.gov.au/dataset/fireworks	**Brisbane CityCycle API: www.data.brisbane.qld.gov.au/data/dataset/citycycle**
• You can download a .CSV file of the fireworks data. • The data can also be access via a web API. • The data is in this format: {"help": "https://data.qld.gov.au/api/3/action/help_show?name=datastore_search", "success": true, "result": {"resource_id": "346d58fc-b7c1-4c38-bf4d-c9d5fb43ce7b", "fields": [{"type": "int4", "id": "_id"}, {"type": "timestamp", "id": "Display Date"}, {"type": "text", "id": "Times(s)"}, {"type": "text", "id": "Suburb"}, {"type": "numeric", "id": "PCode"}, {"type": "text", "id": "Display Address"}, {"type": "text", "id": "Event Type"}, {"type": "text", "id": "Display Type"}], "records": [{"Display Type": "Close Proximity", "Display Address": "", "PCode": "4121", "Suburb": "HOLLAND PARK WEST", "Times(s)": "18:00", "Display Date": "2017-07-04T00:00:00", "Event Type": "PRIVATE", "_id": 1}, {"Display Type": "Outdoor Displays", "Display Address": "", "PCode": "4006", "Suburb": "BOWEN HILLS", "Times(s)": "18:30", "Display Date": "2017-07-05T00:00:00", "Event Type": "PRIVATE", "_id": 2}, {"Display Type": "Close Proximity", "Display Address": "", "PCode": "4000", "Suburb": "BRISBANE", "Times(s)": "20:45", "Display Date": "2017-07-05T00:00:00", "Event Type": "PRIVATE", "_id": 3}, {"Display Type": "Outdoor Displays", "Display Address": "", "PCode": "4006", "Suburb": "BOWEN HILLS", "Times(s)": "18:30", "Display Date": "2017-07-06T00:00:00", "Event Type": "PRIVATE", "_id": 4}, {"Display Type": "Close Proximity", "Display Address": "", "PCode": "4350", "Suburb": "MIDDLE RIDGE", "Times(s)": "18:30", "Display Date": "2017-07-07T00:00:00", "Event Type": "PRIVATE", "_id": 5}], "_links": {"start": "/api/action/datastore_search?limit=5&resource_id=346d58fc-b7c1-4c38-bf4d-c9d5fb43ce7b", "next": "/api/action/datastore_search?offset=5&limit=5&resource_id=346d58fc-b7c1-4c38-bf4d-c9d5fb43ce7b"}, "limit": 5, "total": 23}}	• There is both a static and real-time dataset for Brisbane CityCycle. • The static data is available in JSON format and CSV format. • The dynamic dataset has additional data added to it, it's updated every minute and it is available through an API. • The results from the API will be in JSON format and UTF-8 encoded. • You need a personal API key to access the dynamic set. API keys are free but you need to sign up for one.

Synthesis of investigation

- From the given example, it can be seen that JSON uses fewer instructions in it than XML. JSON is considered to be more concise than XML making it faster and easier to use.
- If you are using someone else's API, they probably have already decided the format for you.
- The datasets have data in the following formats: .CSV, API, and JSON.

Recommendation

- It would be best to use the JSON format.

Retrieving and comprehending [3–4]

appropriate recognition and description of components of data exchange systems

Links to other support websites and mood tracker

Links to other support website

The data below is from the "Apps and tools for Queensland Youth" dataset.

_id	Application name	Description	Category	Web	Android	Apple iOS	Windows ...	Icon
1	Anxiety and depression checklist	This simple checklist aims to measure whether you may have ...	Mind, body and soul	https://www.beyo...				
2	Australian Taxation Office	The ATO app puts tax and super help in your hand, making it ...	Life skills	https://www.ato.g...	https://pl...	https://it...	http://ww...	https://lh5.ggpht....
3	Creep Quiz: Are U Safe Online?	Take this interactive cyber safety quiz to find out more about t...	Be safe	http://creepquiz.e...				
4	Crimestoppers Queensland	The Crime Stoppers Queensland App now makes anonymous...	Be safe	http://www.crimes...	https://pl...	https://it...		http://a2.mzstatic...
5	Culturalist	Brisbane's Cultural Precinct is a collection of Queensland's le...	Arts, culture and entert...	http://www.arts.ql...	https://pl...	https://it...		https://lh3.google...
17	Music eScape	Music can have a powerful effect on our mood. We use it dail...	Mind, body and soul	http://www.emhpr...		https://it...		http://a4.mzstatic...
5	Daisy	Daisy is free and connects women around Australia to service...	Be safe	https://www.1800r...	https://pl...	https://it...		https://lh4.ggpht....
7	Emergency+	An app has been developed to encourage people to call the c...	Be safe	http://www.triplez...	https://pl...	https://it...		https://lh4.ggpht....
8	Express Plus Centrelink	This app makes it even easier for you to do your Centrelink b...	Money wise	https://www.huma...	https://pl...	https://it...		//lh6.ggpht.com/s...
9	Express Plus Medicare	Use the app to view your Medicare claim history, update your ...	Money wise	https://www.huma...	https://pl...	https://it...	https://ww...	http://lh4.ggpht.c...
10	Help Me	The Daniel Morcombe Foundation 'Help Me' App is a great w...	Be safe	http://www.daniel...	https://pl...	https://it...		https://lh5.ggpht....
18	myCompass	myCompass provides a personalised self-help program that y...	Mind, body and soul	https://www.myco...				
11	Housing Assist Qld	The free Housing Assist Qld app is designed to help people s...	Life skills	https://www.qld.g...	https://pl...	https://it...	https://ww...	https://lh3.ggpht....
12	iMatter	The iMatter app has been developed to help young women u...	Be safe	https://www.donc...	https://pl...	https://it...		https://lh4.ggpht....
13	Kids Helpline	Web counselling lets you connect one-on-one in real time onli...	Finding help	https://kidshelplin...				
14	Lifeline	Online crisis support chat is available from 7pm to 4am, 7 day...	Finding help	https://www.lifelin...				
15	Life Charge Journaling	A mobile phone app for quickly and easily capturing the positi...	Mind, body and soul	http://www.vector...		https://it...		http://is1.mzstati...
16	MoneySmart calculators and apps	Find a calculator for every money issue to help give you direct...	Money wise	https://www.mone...				https://lh5.ggpht....
19	My Phone Rights	My Phone Rights is designed to enable consumers and small ...	Life skills	http://accan.org.au/	https://pl...	https://it...		https://lh3.ggpht....
20	My QuitBuddy	This app helps you get and stay smoke free. It's with you thro...	Mind, body and soul	http://www.quitno...	https://pl...	https://it...	https://ww...	https://lh5.ggpht....
21	MyTranslink	MyTransLink puts bus, train, ferry and tram information in the ...	Life skills	http://mobile.trans...	https://pl...	https://it...		https://lh5.ggpht....
22	National Relay Service	The National Relay Service (NRS) is for any Australian who is ...	Finding help	http://relayservice....	https://pl...	https://it...		https://lh5.ggpht....
23	OpenAccess Alerts	Keep informed on important announcements wherever you ar...	Finding help	http://www.conex...	https://pl...	https://it...		http://a4.mzstatic...

From the web application description, the purpose of the links section is to provide links to various support websites. The user is meant to be able to customise the list be removing or adding alternative websites to the list. It has been suggested that the "Apps and tools for Queensland Youth" dataset be used to provide the links.

The dataset is available as a .CSV file that can be downloaded, and as a JSON formatted API.

Synthesising and evaluating [3–4]

simple synthesis of information or ideas to determine data, algorithms and code components of data exchange solutions

Analysis

- The data is quite static, it can be updated but it's basically a list of websites.
- The API is provided by the government, you can't customise the data.
- The .CSV file could be downloaded and added to a database.

Recommendation

- Use the .CSV file rather than the API.
- Download the .CSV file and use it to create a database table with the data in the .CSV file.

Mood tracker

From the web application description, the purpose of the mood tracker component is for the user to be able to use icons or text to indicate their current mood. The information will need to be stored for later use.

Analysis

- Because the data is going to need to be stored, whatever is used to represent the various mood is going to have to be able to send data back to be stored somewhere.

Recommendation

- Use a set of buttons similar to the ones illustrated above. When a user clicks on a button, the data will be sent back to a database for later use.

Communicating [1–2]

variable decision-making about, and inconsistent use of suitable language and grammar and language structures

Synthesising and evaluating [3–4]

simple synthesis of information or ideas to determine data, algorithms and coded components of data exchange solutions

Communicating [3–4]

discerning decision-making about, and fluent use of written and visual features to communicate about a solution

Retrieving and comprehending [1–2]

variable symbolisation and superficial explanation of aspects of data interface, data flow relationships

Where are they?

From the web application description, the "Where are they" component, is to enable the users to take a photo, upload it and share it with their friends. The photo will be associated with a friend and the location of where the photo was taken indicated on a map.

Analysis

- Smartphones and digital cameras have the GPS coordinates embedded in the photos.
- Smartphones also enable you to share location data.
- The GPS coordinates will give you the longitude and latitude at the position at which the photo was taken.
- You would have to be able to extract the GPS coordinates from the photo.
- You'd have to be able to find these coordinates on a map.
- Google has a number of Google Maps APIs available. You could use one of these to plot the GPS coordinates on a map.
- The photos will need to be stored somewhere. Because other friends are supposed to see the photos as well, they'd have to be uploaded to a server and stored.

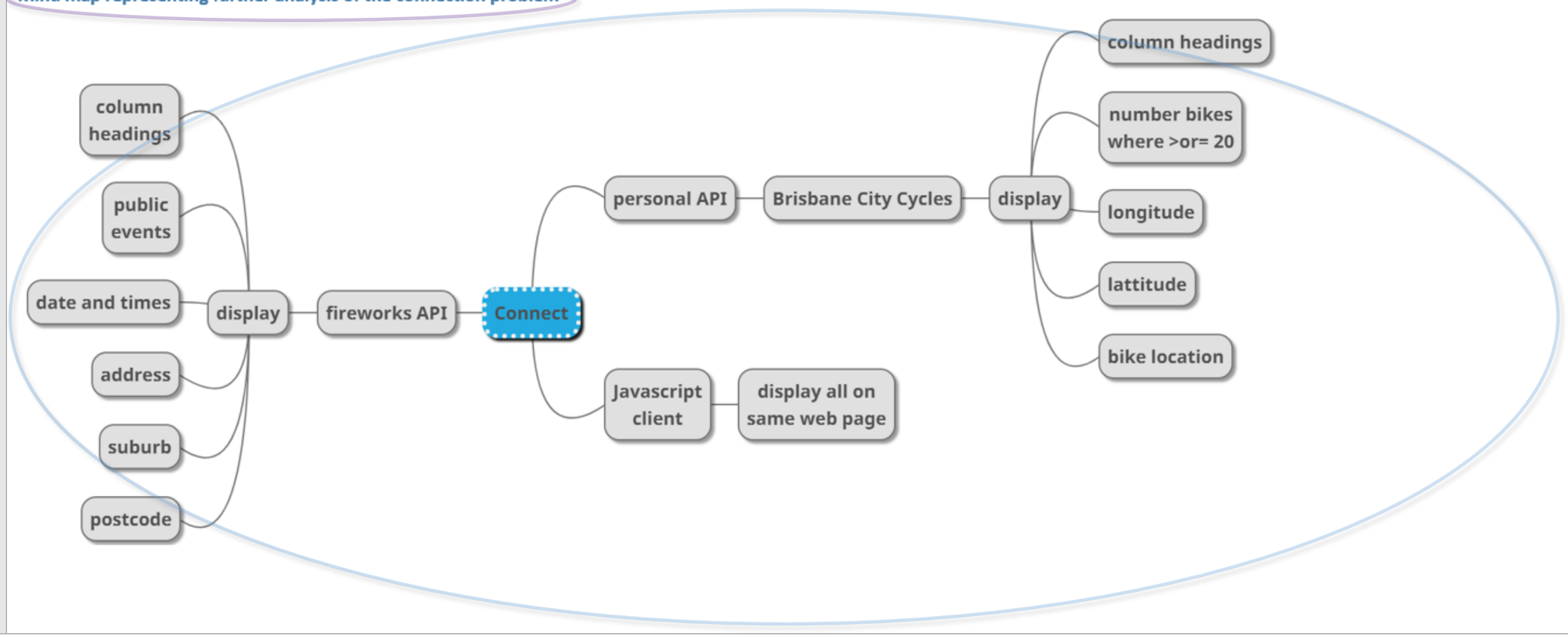
Recommendation

- Use your devices GPS coordinates to know your location when you took the photo.
- Upload the photo to a database via a web server.
- You'd write a script to find the GPS coordinates in the photo. The script would need to be on the server.
- You would use a Google Maps API to then plot the coordinates on the map in the web application.

Part 2 – Data Exchange Solution

Mind map

Mind map representing further analysis of the connection problem



Analysing [2–3]

appropriate analysis of the data exchange problem and information related to data security to identify the data structures

Data Structures

Data Structures

- Both datasets, when accessed from the API display their data in JSON format:

Upcoming fireworks displays: data.qld.gov.au/dataset/fireworks	**Brisbane CityCycle API: www.data.brisbane.qld.gov.au/data/dataset/citycycle**

This data set uses a personal API access key to access the dynamic data:
 	
The name:value pairs within the file are in this format:
{
“number”: 122,
“name”: 122 – LOWER RIVER TCE/ELLIS ST”,
“address”: “Lower River Tce / Ellis St”,
“position”: {
“lat”: -27.482279,
“lng”: 153.028723
banking”: false,
“bonus”: false,
“status”: “OPEN”,
“contract_name”: “Brisbane”,
“bike_stands”: 16,
“available_bike_stands”: 4,
“available_bikes”: 11,
“last_update”: 1499599854000
},
Most of the data is formatted as string data. There are seven name: value pairs for which the values are numeric data rather than string, they are: number, lat, lng, bike_stands, available_bike_stands, available_bikes, last_update.
	The resource id is: 346d58fc-b7c1-4c38-bf4d-c9d5fb43ce7b
	
	The name:value pairs within the file are in this format:
	
	{ “Display Type”: “Close Proximity”,
	“Display Address”: “ “,
	“PCode”: 4121”,
	“Suburb”: “HOLLAND PARK WEST”,
	“Time(s)”: “18:00”,
	“Display Data”: “2017-07-04T00:00:00”,
	“Event Type”: “PRIVATE”,
	“_id”: 1,
	},
	
	All of the data is formatted as string data except for the final _id which is numeric.

Algorithm and data flow

Synthesising and evaluating [3–4]

simple synthesis of information or ideas to determine data, algorithms and coded components of data exchange solutions

Retrieving and comprehending [3–4]

appropriate recognition and description of key elements of an application, components of data exchange systems, and data security processes

Algorithm

For each dataset, do the following

Display the heading for the dataset

Assign the URL to request the dataset to a variable

Send a HTTP request to the dataset

If the data has been received correctly

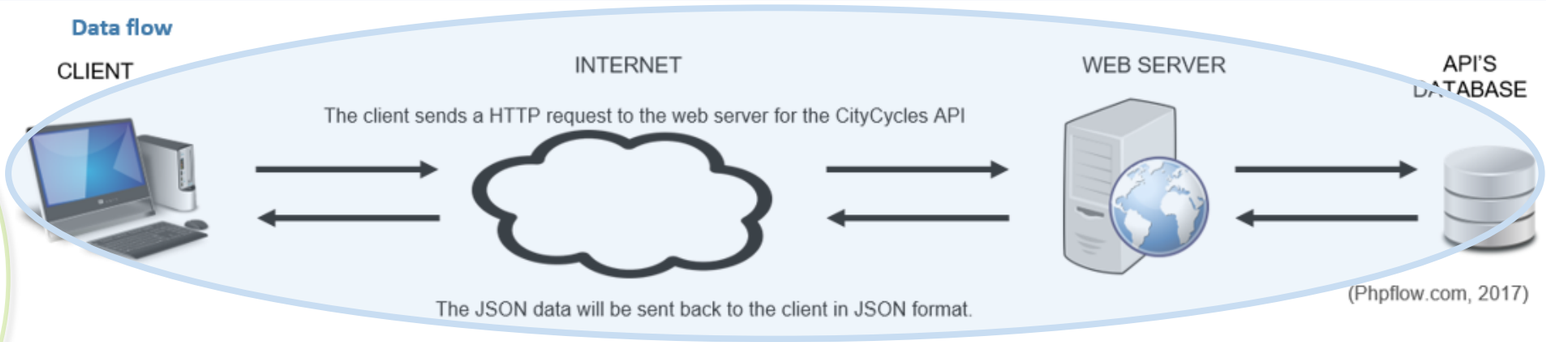
    Assign all the data to a variable

    Loop through the variable

        Extract the data

Display the results on the web page

Data flow



Synthesising and evaluating [3–4]

simple synthesis of information or ideas to determine coded components of data exchange solutions

adequate generation of components of the data exchange solution

JavaScript Client Evidence

Screen shot of JavaScript client

Brisbane Bicycles

Bike Location	Latitude	Longitude	Bikes available
122 - LOWER RIVER TCE / ELLIS ST	[object Object]	[object Object]	9
91 - MAIN ST / DARRAGH ST	[object Object]	[object Object]	4
88 - SYDNEY ST FERRY TERMINAL / PARK	[object Object]	[object Object]	26
75 - BROWNE ST / JAMES ST	[object Object]	[object Object]	13
98 - KURILPA POINT / MONTAGUE RD	[object Object]	[object Object]	2
109 - MONTAGUE RD / SKINNER ST	[object Object]	[object Object]	10
149 - MACQUARIE ST / GUYATT PARK	[object Object]	[object Object]	8
139 - BI-CENTENNIAL BIKE WAY / LANG PDE	[object Object]	[object Object]	10
24 - SIR WILLIAM MCGREGOR DR / SIR FRED SCHONNELL	[object Object]	[object Object]	0
117 - VULTURE ST / TRIBUNE ST	[object Object]	[object Object]	15
73 - LAMINGTON ST / REFINERY PDE	[object Object]	[object Object]	5
1101 - KING GEORGE SQUARE 2	[object Object]	[object Object]	16
23 - MARY STREET / GEORGE STREET	[object Object]	[object Object]	1
54 - MCLACHLAN ST / WINN ST	[object Object]	[object Object]	11
93 - GREY ST / QCA	[object Object]	[object Object]	14
31 - ROMA ST / TURBOT ST	[object Object]	[object Object]	0
97 - THYNNE RD / COLLEGE RD	[object Object]	[object Object]	14
147 - SANDFORD ST / BRISBANE ST	[object Object]	[object Object]	26
77 - JAMES ST / HARCOURT ST	[object Object]	[object Object]	8
119 - SIDON ST / LITTLE STANLEY ST	[object Object]	[object Object]	9
39 - TURBOT ST / WICKHAM TCE	[object Object]	[object Object]	9
55 - ALDEN ST / WICKHAM ST	[object Object]	[object Object]	14
35 - ROMA STREET / MAKERSTON STREET	[object Object]	[object Object]	0
150 - MACQUARIE ST / MUNRO ST	[object Object]	[object Object]	2
80 - BARKER ST / BRUNSWICK ST	[object Object]	[object Object]	5
78 - MALT ST / BRUNSWICK ST	[object Object]	[object Object]	1
65 - CHERMSIDE ST / COMMERCIAL RD	[object Object]	[object Object]	20
44 - QUEEN STREET / ADELAIDE STREET	[object Object]	[object Object]	2
56 - CONSTANCE ST / ST PAULS TCE	[object Object]	[object Object]	8
50 - GIPPS ST / WICKHAM ST	[object Object]	[object Object]	17
95 - STANLEY ST / MELBOURNE ST	[object Object]	[object Object]	7
13 - ALBERT STREET MALL / ADELAIDE STREET	[object Object]	[object Object]	14
36 - ROMA STREET / GARRICK STREET	[object Object]	[object Object]	13
137 - KILROE ST / DORSEY ST	[object Object]	[object Object]	16
79 - BALFOUR ST / BRUNSWICK ST	[object Object]	[object Object]	2
38 - ANN ST / CREEK ST	[object Object]	[object Object]	15
14 - ALBERT STREET MALL / ELIZABETH STREET	[object Object]	[object Object]	15
45 - TURBOT ST / BOWEN ST	[object Object]	[object Object]	2
1 - EDWARD ST / QUEEN ST	[object Object]	[object Object]	15
116 - CORDELIA ST / ERNEST ST	[object Object]	[object Object]	9

Fireworks

- The bicycles data was displayed but the fireworks did not, even though I used almost the same script.
- Latitude and Longitude are not displaying properly in the bicycles table.
- The code will get the data from the URL – it will be JSON format
- *The API key has been blanked out.*

Code for JavaScript client

```
<h1>Brisbane Bicycles</h1>
<div id="bicycles"></div>
<script>
// Bicycle data
var xhr = new XMLHttpRequest();
xhr.open('GET',
'https://api.jcdecaux.com/vls/v1/stations?contract=Brisbane&apiKey=[redacted]a222bb24ca28ee8d', true);
xhr.send(null);
xhr.onreadystatechange = function() {
   if (this.readyState == 4 && this.status == 200) {
      // extract the data
      myJSON= xhr.responseText;
      var myObj = JSON.parse(myJSON);
      // set up the table
      var out = "<table border='1'>";
      out += "<tr><td>Bike Location</td><td>Latitude</td><td>Longitude</td><td>Bikes
available</td></tr>"
      // get the data
      for (var i in myObj){
          out += "<tr><td>" +myObj[i].name + "</td><td>" + myObj[i].position + "</td><td>"
+ myObj[i].position + "</td><td>" + + myObj[i].available_bikes +"</td></tr>";
      }
      out += "</table>";
      document.getElementById("bicycles").innerHTML = out;
   }
}
</script>

<h1>Fireworks</h1>
<div id="fireworks"></div>
  <script>
  // Fireworks data
  var xhr2 = new XMLHttpRequest();
  xhr2.open('GET',
'https://data.qld.gov.au/api/action/datastore_search?resource_id=346d58fc-b7c1-4c38-bf4d-c9d5fb43ce7b&q='PUBLIC'", true);
  xhr2.send(null);
  xhr2.onreadystatechange = function() {
     if (this.readyState == 4 && this.status == 200) {
      // extract the data
      myJSON2 = xhr2.responseText;
      var myObj2 = JSON.parse(myJSON2);
      // set up the table
      var out2 = "<table border='1'>";
      out2 +=
'<tr><td>Date</td><td>Time</td><td>Suburb</td><td>PCode</td><td>Address</td><td>Event
Type</td></tr>";
      // get the data
      for (var i in myObj2) {
        out2 += "<tr><td>" +myObj2[i].Date +"</td><td>" +myObj2[i].Times(s) +"</td><td>"
+myObj2[i].Suburb +"</td><td>" +myObj2[i].Display Address +"</td><td>" +myObj2[i].Display
Address +"</td><td>" +myObj2[i].Event Type +"</td></tr>";
      }
      document.getElementById("fireworks").innerHTML = out;
    }
  }
</script>
```

Synthesising and evaluating [5–6]

reasoned evaluation of coded components against effective criteria to make effective refinements of code and considered recommendations

Synthesising and evaluating [3–4]

feasible evaluation of a digital data exchange solution against some criteria to make adequate refinements of code and fundamental recommendations

Evaluation

Prescribed Criteria	Testing	Evaluation
Code accuracy		
• Your JavaScript client utilises the two stated datasets.	• Check the datasets against the requirements.	• Both datasets are correct.
• Your JavaScript client will connect to each dataset.	• Once the HTTPS files for each data set have been correctly formed, copy the URL into the address bar of the browser to see if the data is displayed.	• Both URLs successfully displayed the data when tested in isolation.
• Your JavaScript client will display only the stated data.	• Run the program and view results.	• The CityCycles dataset is being displayed but the Fireworks data is not being displayed. • The CityCycles data is mostly correct. Only those locations that have more than 20 bikes available should be being displayed. This is not happening. All data for all locations is being displayed. • The Latitude and Longitude data is not displaying correctly. [object Object] is being displayed rather than the actual data. • None of the data from the Fireworks API is being displayed. The code is almost the same but for some reason it is not being displayed.
• Your JavaScript client will have column headings for the data.	• Run the program and check the results for column headings.	• All the column headings for the CityCycles dataset are being correctly displayed. • None of the column headings for the Fireworks dataset are being displayed.
• The data is to be displayed on the same web page.	• Run the program and check the results.	• The CityCycles data is being displayed and this is followed by the heading for the Fireworks data, but as already stated, the data from the Fireworks dataset is not being displayed.
Code efficiency	• Check the load time of the web page. • Go through the code and check for repetition.	• The HTML headings for Bicycles and Fireworks seem to load faster than the data. The data isn't slow, it's just that the headings are visible before the data arrives. • Because basically the second script is a copy of the first, there may be some repetition in this and room for more efficient code.
Self-Determined Criteria:		
Works on different platforms.	• View the datasets and JavaScript client running in different browsers.	• When I first tried to open the fireworks dataset at school, I found that I was unable to open it. One of the other students told me to try a different browser. When I did that I was able to open the datasets.

Analysing [4–5]

considered analysis of the data exchange problem and relevant information related to data security to identify the risks to data and code components

Synthesising and evaluating [3–4]

reasoned evaluation of impacts, coded components against effective criteria to make effective refinements of code and considered recommendations

Part 3 - Impacts

Potential security and privacy implications

	ANALYSIS
Data security	• There is no indication that the web application is protected by a user name and password. • The areas of the web application that are most vulnerable are those that collect and send data back to a database. These include the mood tracker, and the Where are they components. Both of these contain data that would need to be protected both whilst being transferred and whilst being stored. • The HTML request uses HTTPS to send the data. • You need a personal API access key to access the data in the CityCycles dataset. A personal API key needs to be embedded in the HTTP request. • API keys don't seem that secure, you can see them in the code. • The data in the datasets is public data anyway, what security is needed when the data is publicly available? • Security hasn't basically been mentioned for the web application. • The Fireworks dataset appears to have a hashing function applied to it. In the additional information on the Queensland Government's data site, it lists a hashing function value.
Data privacy	• The absence of a user name and password or some form of identification process leaves the data in the web application vulnerable. • The mood tracker and Where are they components both contain personal data and this must be secured. These components have the potential to be exploited if not secured correctly. • Some device will enable you to turn off GPS and other geolocation data from being used, but this will mean that section won't run.

IMPACTS	EVALUATION	RECOMMENDATIONS
Personal	• This web app is collecting personal information. In particular the ability to locate friends from a photo and the mood tracker data needs to be protected.	• Utilise secure usernames and password for this web app. Ensure this is encrypted. Two phase authentication could be used or at least strong passwords. • Use HTTPS for all web application web pages. • All data being sent between the application and the database will need to be encrypted.
Social	• The mood tracker part of this web app could be problematic.	• Limit the number of friends you enable use of the Where are they component.
Ethical	• Where the data is being stored needs careful consideration.	• Use Australian servers to host the web application.
Economic	• The dynamic data sets are not owned by the creator of the web application. JCDecaux provide the data on the Brisbane City Council's CityCycle service. The Queensland Government's Natural Resources and Mines department provides the data for the fireworks API. As the creator of the web application has no control over these, there is potential for impact on the app. This could be economic.	• JCDecaux operates datasets worldwide and the Fireworks API was created in November 2014. The assumption is that they both have good track records in providing data. This is however the nature of using public APIs. It would be prudent to have a backup plan to replace this data if needed.
Legal	• The web app will be collecting data and storing it on a database on the Internet. There would need to be a statement on the web app relating to how it was using the data.	• Ensure there is a privacy statement on the web app.

This video can be viewed at www.qcaa.qld.edu.au/downloads/portal/media/snr_digital_solutions_19_ia3_mid_resp.mp4.

Communicating [1–2] variable decision-making about, and inconsistent use of referencing conventions	**References** **REFERENCES** Australian Government. *Datasets.* Available at: data.gov.au/dataset [Accessed 30 June 2017] Delivering a Youth-Friendly City. Youth Strategy 2014 - 2019. (2013). [PDF] Brisbane: Brisbane City Council, p.5. Available at: www.brisbane.qld.gov.au/sites/default/files/youth_strategy_full_document.pdf [Accessed 24 May 2017] Hoffman, C. (2015) *How to See Exactly Where a Photo Was Taken (and Keep Your Location Private)* Available at: www.howtogeek.com/211427/how-to-see-exactly-where-a-photo-was-taken-and-keep-your-location-private/ [Accessed 8 July 2017] Ionescu, D. (2010) *Geolocation 101L How it Works, the Apps, and Your Privacy.* PCWorld. Available at: www.pcworld.com/article/192803/geolo.html [Accessed 4 July 2017] Open Data Handbook. *File Formats.* Available at: opendatahandbook.org/guide/en/appendices/file-formats/ [Accessed 4 July 2017] Phpflow.com (2017) *Types of Web Services SOAP, XML-RPC and Restful.* Available at: www.phpflow.com/php/web-service-types-soapxml-rpcrestful/ [Accessed 30 June 2017] Protecting Web Application and Users (2012) (PDF) Australian Government: Defence Signals Directorate, Available at: www.asd.gov.au/publications/protect/Protecting_Web_Apps.pdf W3schools.com. (2017). *JSON vs XML.* [online] Available at: https:www.w3schools.com/js/js_json.xml.asp [Accessed 30 June 2017].

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