

Testing Documentation

1 Testing Process

1.1 Running the Tests

Our tests are managed in Postman, an automated testing client. Postman allows us to simply and clearly create tests by specifying a URL, request type and set of input parameters, and the expected output of the response in JSON form. Using the client, we can specify one or more tests to run, and the number of iterations for which we should run them, allowing us to ensure that our API behaves consistently under repeated calls. It also provides us with the time and size of each response, which we can use to estimate the API's performance.

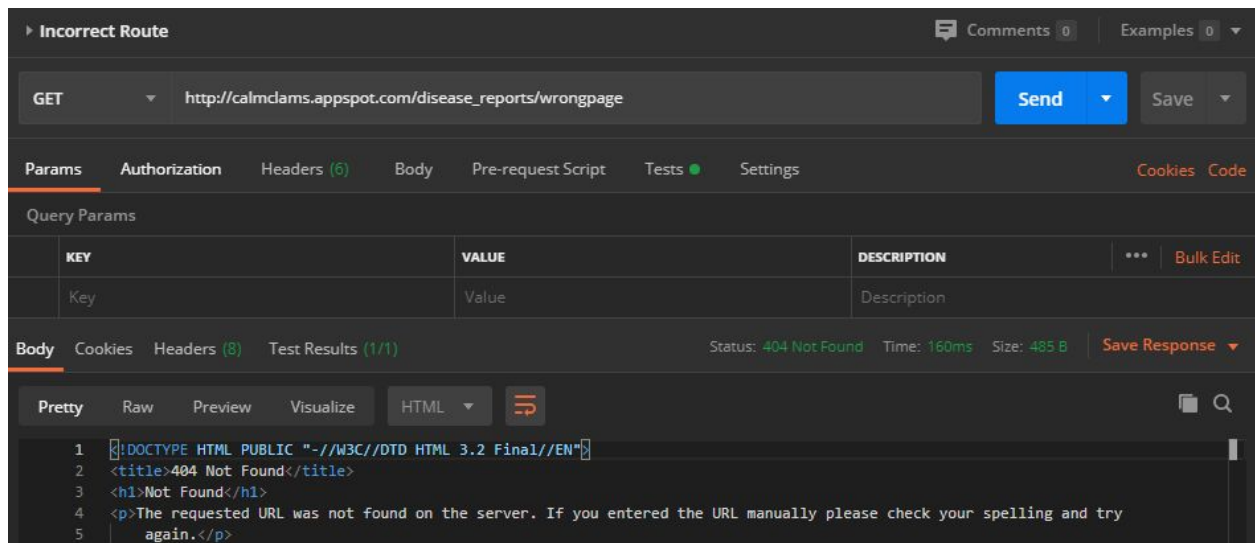
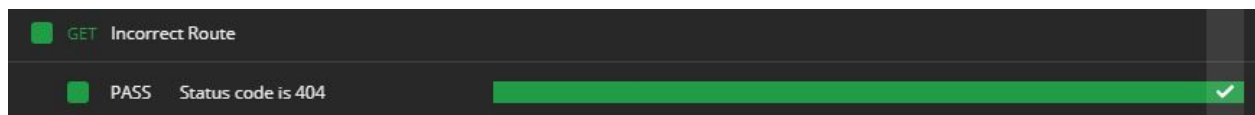
We made 2 collections of tests in Postman. The first collection tests a locally running API on localhost:5000, so that we can quickly run tests on development code. The second collection runs the same tests on the deployed API, so that we can test and monitor the status of the publicly accessible system.

Once exported from Postman, the tests can also be run through the command line using the "newman" command, making it easier for developers to quickly run a suite of tests after making local changes.

1.2 Test Cases

Incorrect Route

Input	Invalid URL.
Expected response	404 Not Found, message to user that the URL cannot be found.
Purpose of test	The API should return a 404 response for URLs other than the /disease_reports path used to search for reports.
Response time	~30 ms



Normal Request

Input	Valid start and end dates, a single key term, a valid location.
Expected response	200 OK, JSON object containing a list of articles matching the specified search criteria.

Purpose of test	Given a set of valid inputs, if the API has data matching the search criteria, it should return a JSON object with a consistent form to the user with the data and details of the request made.
Response time	~500ms

GET	Normal Request	
PASS	Status code is 200	✓
PASS	Articles value is as expected	✓

Normal Request

GET http://calmclams.appspot.com/disease_reports?start_date=2015-01-01T00:00:00&end_date=2018-01-23T1 Send Save

Params Authorization Headers (6) Body Pre-request Script Tests Settings Cookies Code

Query Params

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	start_date	2015-01-01T00:00:00			
<input checked="" type="checkbox"/>	end_date	2018-01-23T19:37:12			
<input checked="" type="checkbox"/>	key_terms	swineflu			
<input checked="" type="checkbox"/>	location	punjab			
	Key	Value	Description		

Body Cookies Headers (8) Test Results (2/2) Status: 200 OK Time: 629ms Size: 908 B Save Response

Pretty Raw Preview Visualize JSON

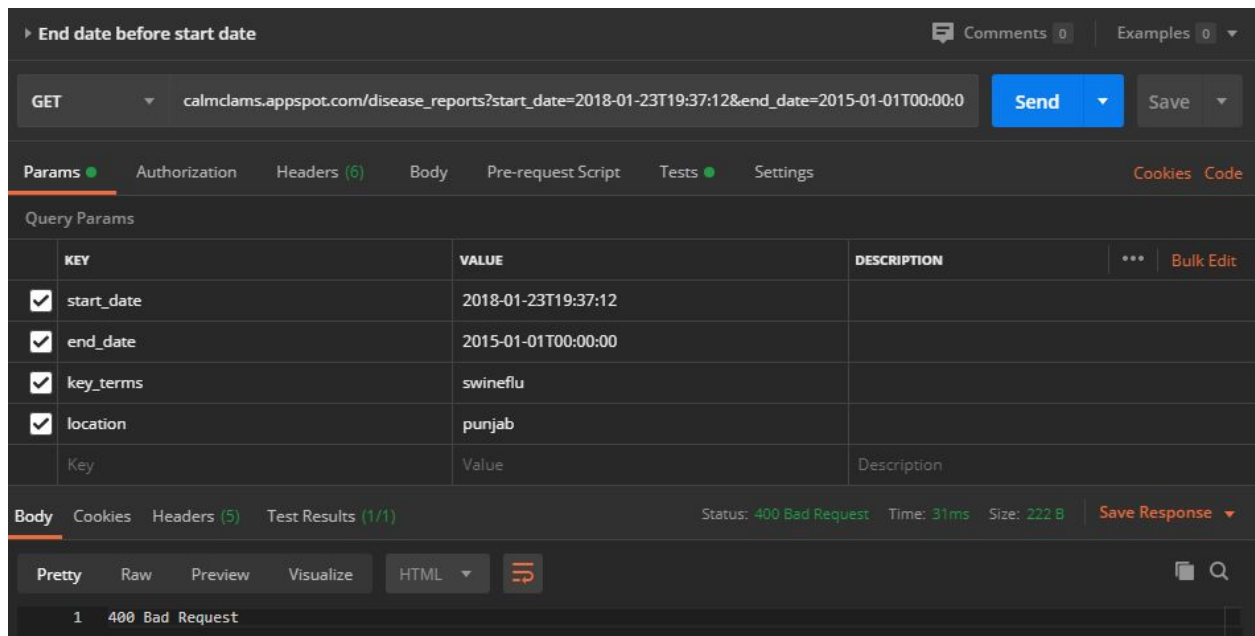
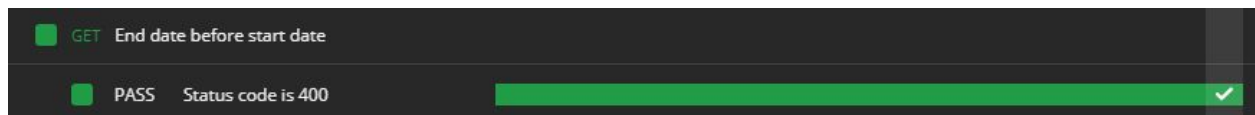
```

1  {
2    "articles": [
3      {
4        "_id": 18683,
5        "date_of_publication": "2015-01-20 18:01:xx",
6        "headline": "27 cases in Hyderabad, 1 death in Punjab",
7        "main_text": "While an outbreak of swineful has claimed one life in Punjab, as many as 27 people in Telanganas capital Hyderabad have tested positive for the H1N1 virus, and their treatment is underway at the Gandhi Hospital here, while 35 cases are under observation for suspected influenza.\nRead Full Article At :: http://www.ddinews.gov.in/National/National%20-%20Headlines/Pages/Swineflu27casesinHyderabad,1deathinPunjab.aspx",
8        "reports": [
9          {
10             "diseases": [
11               "influenza a/h1n1"
12             ],
13             "event_date": "2015-01-20 18:01:xx",
14             "locations": [
15               {
16                 "coords": "31.147, 75.341",
17                 "country": "India",
18                 "location": "Punjab"
19               }
20             ],
21             "syndromes": []
22           }
23         ]
24       }
25     ]
26   }

```

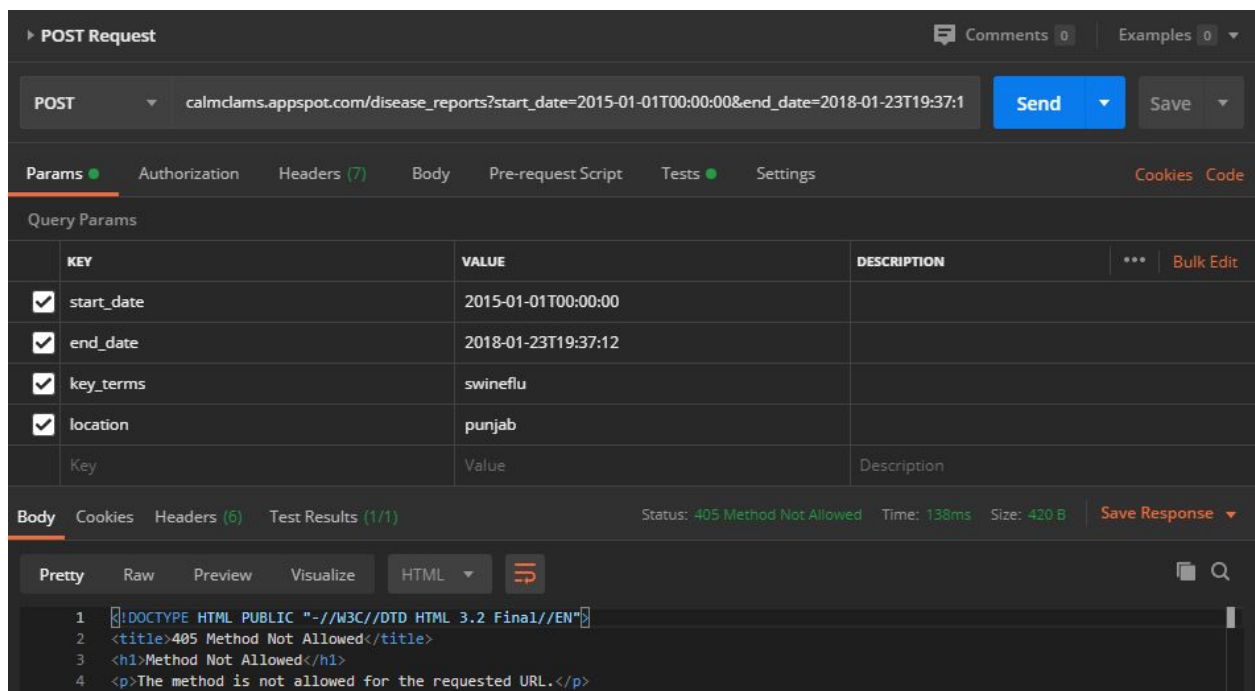
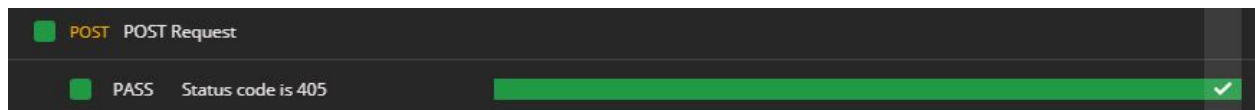
End Date Before Start Date

Input	A start date chronologically earlier than an end date, with otherwise valid input data.
Expected response	400 Bad Request
Purpose of test	The API should return a 400 response for user data that doesn't match the required specifications, to indicate that the input was invalid.
Response time	~40ms



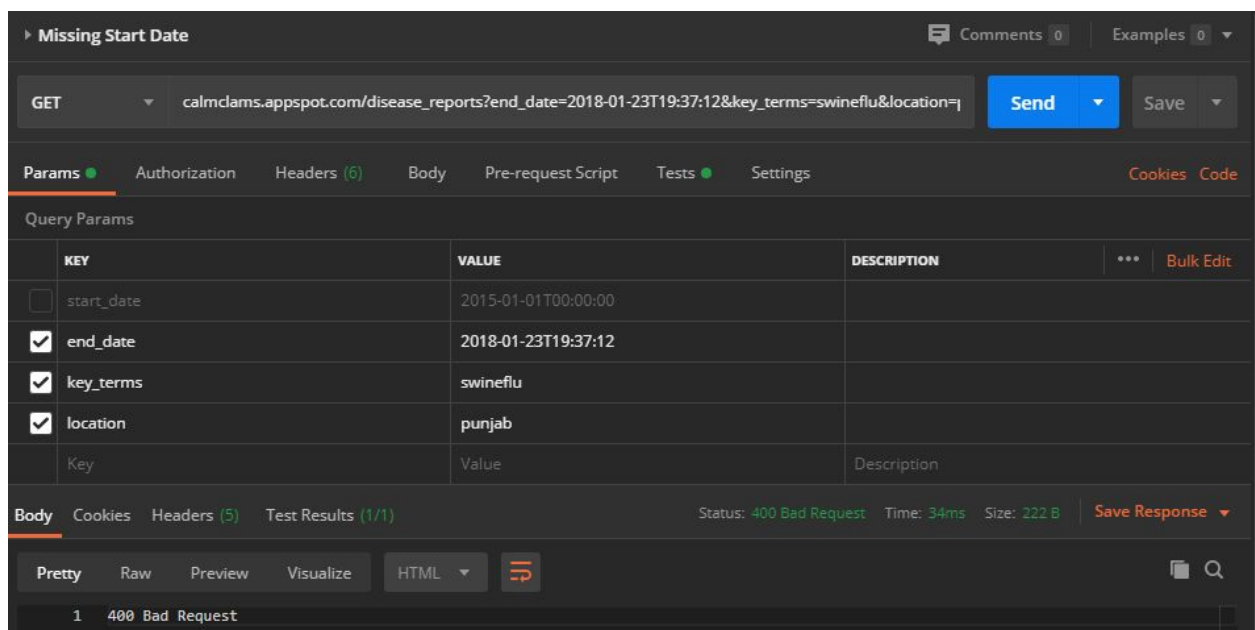
POST Request

Input	A POST Request with otherwise valid input data.
Expected response	405 Method Not Allowed
Purpose of test	The API accepts queries through GET requests, and should indicate to the user that their request type was invalid for other requests, regardless of the correctness of other input data.
Response time	~30ms



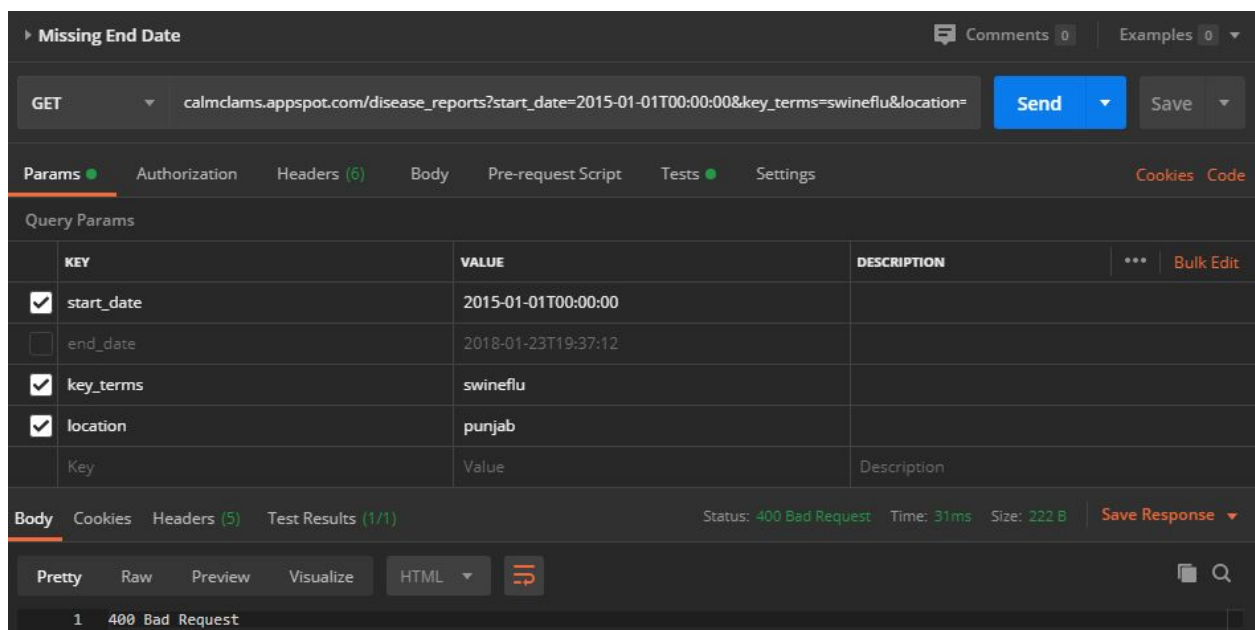
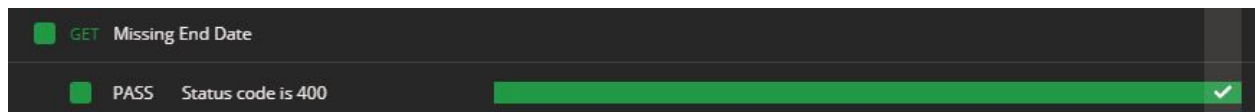
Missing Start Date

Input	Valid input data with the start date missing.
Expected response	400 Bad Request
Purpose of test	The API should return a 400 response for user data that doesn't match the required specifications, to indicate that the input was invalid. The start date is a required input, so any request in which it is missing is invalid.
Response time	~40ms



Missing End Date








Input	Valid input data with the end date missing.
Expected response	400 Bad Request
Purpose of test	The API should return a 400 response for user data that doesn't match the required specifications, to indicate that the input was invalid. The end date is a required input, so any request in which it is missing is invalid.
Response time	~40ms



Missing Key Terms

Input	Valid start and end dates, no key term, a valid location.
Expected response	200 OK, JSON object containing a list of all articles between the start and end dates for the given location.

Purpose of test	Given a set of valid inputs, if the API has data matching the search criteria, it should return a JSON object with a consistent form to the user with the data and details of the request made. When no key terms are provided, all records for the given time period and location are matched.
Response time	~400ms

 GET Missing Key Terms	
 PASS Status code is 200	 
 PASS Articles value is as expected	 

Missing Key Terms

GET

calmclams.appspot.com/disease_reports?start_date=2015-01-01T00:00:00&end_date=2018-01-23T19:37:1

Send

Save

Params

Authorization

Headers (6)

Body

Pre-request Script

Tests

Settings

Cookies

Code

Query Params

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	start_date	2015-01-01T00:00:00			
<input checked="" type="checkbox"/>	end_date	2018-01-23T19:37:12			
<input type="checkbox"/>	key_terms	swineflu			
<input checked="" type="checkbox"/>	location	punjab			
	Key	Value	Description		

Body

Cookies

Headers (8)

Test Results (2/2)

Status: 200 OK

Time: 439ms

Size: 5.19 KB

Save Response

Pretty

Raw

Preview

Visualize

JSON

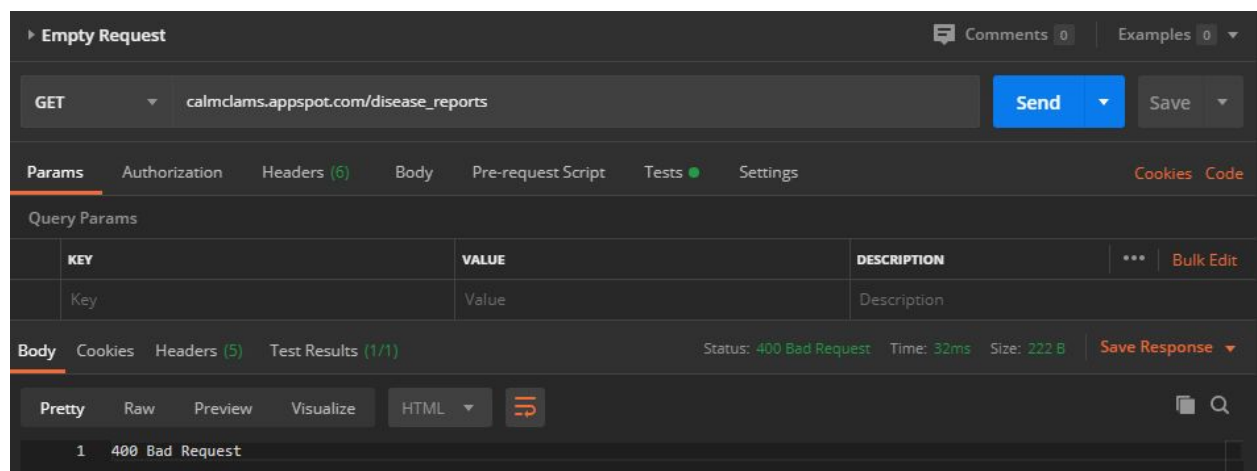
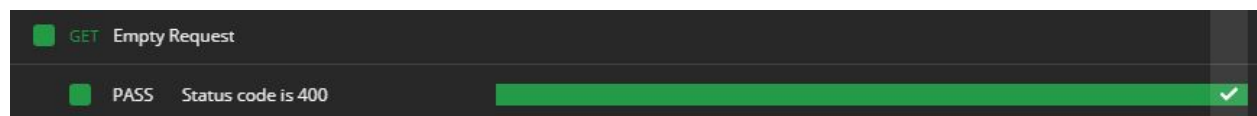
```

1  {
2    "articles": [
3      {
4        "_id": 18683,
5        "date_of_publication": "2015-01-20 18:01:xx",
6        "headline": "27 cases in Hyderabad, 1 death in Punjab",
7        "main_text": "While an outbreak of swineflu has claimed one life in Punjab, as many as 27 people in Telanganas capital Hyderabad have tested positive for the H1N1 virus, and their treatment is underway at the Gandhi Hospital here, while 35 cases are under observation for suspected influenza.\nRead Full Article At :: http://www.ddinews.gov.in/National/National%20-%20Headlines/Pages/Swineflu27casesinHyderabad,1deathinPunjab.aspx",
8        "reports": [
9          {
10             "diseases": [
11               "influenza a/h1n1"
12             ],
13             "event_date": "2015-01-20 18:01:xx",
14             "locations": [
15               {
16                 "coords": "31.147, 75.341",
17                 "country": "India",
18                 "location": "Punjab"
19               }
20             ],
21             "syndromes": []

```


Empty Request








Input	A GET Request with no other input data
Expected response	400 Bad Request
Purpose of test	The API should return a 400 response for user data that doesn't match the required specifications, to indicate that the input was invalid. The start date, end date and location parameters are all required, so any request where they are missing is invalid.
Response time	~30ms



Missing Location

Input	Valid start and end dates, valid key term, no location.
Expected response	200 OK, JSON object containing a list of all articles between the start and end dates for the given key terms.
Purpose of test	Given a set of valid inputs, if the API has data matching the search criteria, it should return a JSON object with a consistent form to the

	user with the data and details of the request made. When no location is provided, all records for the given time period and key terms are matched.
Response time	~500ms

	GET	Missing Location	
	PASS	Status code is 200	 
	PASS	Articles value is as expected	 

Missing Location

Comments 0 Examples 0



GET calmclams.appspot.com/disease_reports?start_date=2015-01-01T00:00:00&end_date=2018-01-23T19:37:12 Send Save

Params Authorization Headers (6) Body Pre-request Script Tests Settings Cookies Code

Query Params

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	start_date	2015-01-01T00:00:00			
<input checked="" type="checkbox"/>	end_date	2018-01-23T19:37:12			
<input checked="" type="checkbox"/>	key_terms	swineflu			
<input type="checkbox"/>	location	punjab			
	Key	Value	Description		

Body Cookies Headers (8) Test Results (2/2) Status: 200 OK Time: 618ms Size: 1.52 KB Save Response

Pretty Raw Preview Visualize JSON  

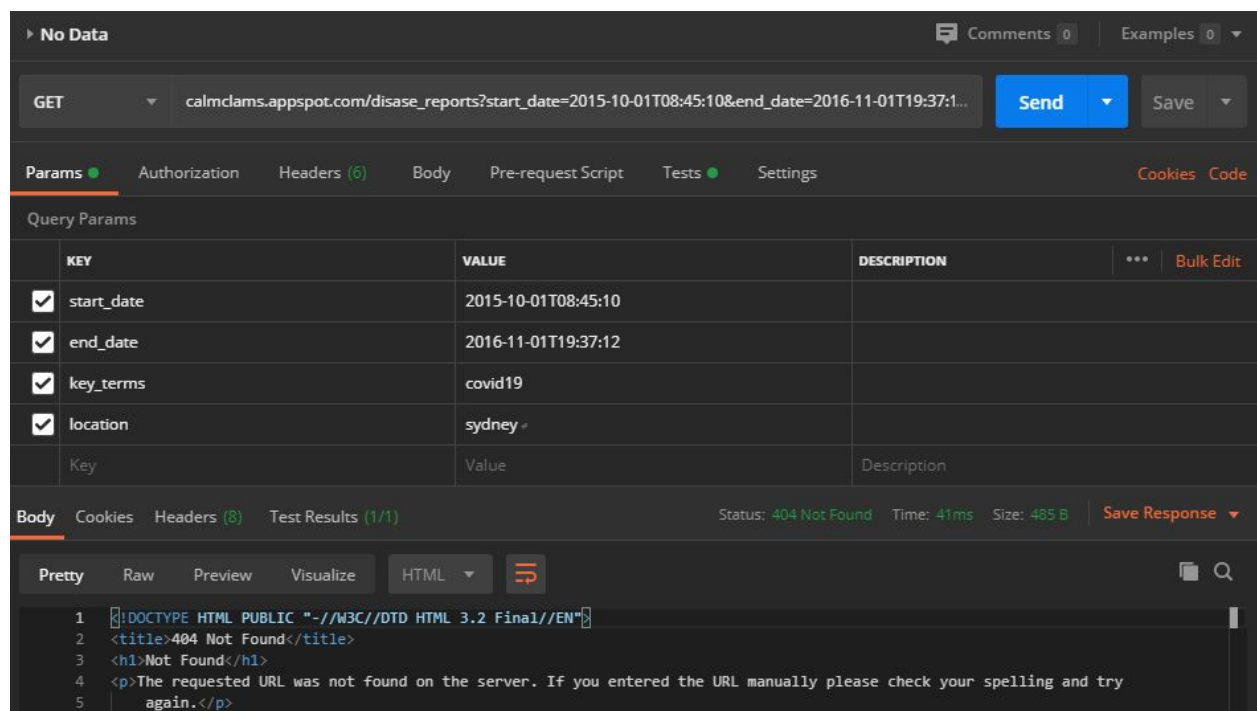
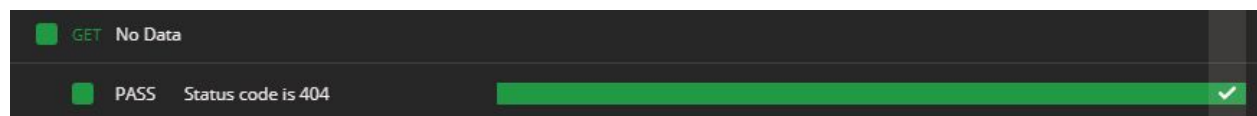
```

1  {
2    "articles": [
3      {
4        "_id": 18683,
5        "date_of_publication": "2015-01-20 18:01:xx",
6        "headline": "27 cases in Hyderabad, 1 death in Punjab",
7        "main_text": "While an outbreak of swineflu has claimed one life in Punjab, as many as 27 people in Telanganas capital Hyderabad have tested positive for the H1N1 virus, and their treatment is underway at the Gandhi Hospital here, while 35 cases are under observation for suspected influenza.\nRead Full Article At :: http://www.ddinews.gov.in/National/National%20-%20Headlines/Pages/Swineflu27casesinHyderabad,1deathinPunjab.aspx",
8        "reports": [
9          {
10             "diseases": [
11               "influenza a/h1n1"
12             ],
13             "event_date": "2015-01-20 18:01:xx",
14             "locations": [
15               {
16                 "coords": "31.147, 75.341",
17                 "country": "India",
18                 "location": "Punjab"
19               }
20             ],
21             "syndromes": []
22           }
23         ]
24       }
25     ]
26   }

```

No Data








Input	Valid start and end dates, a single key term, a valid location, but no matching articles.
Expected response	404 Not Found
Purpose of test	Given a set of valid inputs, if the API cannot find any data matching the search criteria, it should return a 404 response to the user to indicate that data matching their inputs cannot be found.
Response time	~40ms



Multiple Keywords

Input	Valid start and end dates, multiple valid key terms, valid location.
--------------	--

Expected response	200 OK, JSON object containing a list of all articles between the start and end dates for the given location matching at least one key term.
Purpose of test	Given a set of valid inputs, if the API has data matching the search criteria, it should return a JSON object with a consistent form to the user with the data and details of the request made. When multiple key terms are provided, any article containing at least one of the key terms should be matched.
Response time	~600ms

	GET	Multiple Keywords	
	PASS	Status code is 200	 
	PASS	Articles value is as expected	 

Multiple Keywords

Comments 0

Examples 0

GET

http://calmclams.appspot.com/disease_reports?start_date=2015-01-01T00:00:00&end_date=2018-01-23T1

Send

Save

Params

Authorization

Headers (6)

Body

Pre-request Script

Tests

Settings

Cookies

Code

Query Params

	KEY	VALUE	DESCRIPTION	...	Bulk Edit
<input checked="" type="checkbox"/>	start_date	2015-01-01T00:00:00			
<input checked="" type="checkbox"/>	end_date	2018-01-23T19:37:12			
<input checked="" type="checkbox"/>	key_terms	fever,swine			
<input checked="" type="checkbox"/>	location	punjab			
	Key	Value	Description		

Body

Cookies

Headers (8)

Test Results (2/2)

Status: 200 OK

Time: 931ms

Size: 3.93 KB

Save Response

Pretty

Raw

Preview

Visualize

JSON

```

1  {
2    "articles": [
3      {
4        "_id": 18683,
5        "date_of_publication": "2015-01-20 18:01:xx",
6        "headline": "27 cases in Hyderabad, 1 death in Punjab",
7        "main_text": "While an outbreak of swineful has claimed one life in Punjab, as many as 27 people in Telanganas capital Hyderabad have tested positive for the H1N1 virus, and their treatment is underway at the Gandhi Hospital here, while 35 cases are under observation for suspected influenza.\nRead Full Article At :: http://www.ddinews.gov.in/National/National%20-%20Headlines/Pages/Swineflu27casesinHyderabad,1deathinPunjab.aspx",
8        "reports": [
9          {
10             "diseases": [
11               "influenza a/h1n1"
12             ],
13             "event_date": "2015-01-20 18:01:xx",
14             "locations": [
15               {
16                 "coords": "31.147, 75.341",
17                 "country": "India",
18                 "location": "Punjab"

```

Case Sensitivity

Input	Valid start and end dates, valid key term and location with unusual capitalisation.
Expected response	200 OK, JSON object containing a list of all articles between the start and end dates for the given key term and location, matched case-insensitively.
Purpose of test	Given a set of valid inputs, if the API has data matching the search criteria, it should return a JSON object with a consistent form to the user with the data and details of the request made. Location and key term matches should be performed case-insensitively.
Response time	~500ms

The screenshot displays a REST client interface with the following details:

- Request:** GET `http://calmclams.appspot.com/disease_reports?start_date=2015-01-01T00:00:00&end_date=2018-01-23T1`
- Tests:** Two tests passed:
 - PASS: Status code is 200
 - PASS: Articles value is as expected
- Query Params:**

KEY	VALUE	DESCRIPTION
start_date	2015-01-01T00:00:00	
end_date	2018-01-23T19:37:12	
key_terms	SwiNeFlu	
location	PunJAb	
- Response:** Status: 200 OK, Time: 640ms, Size: 912 B. The response body is a JSON object:

```
{  "articles": [    {      "_id": 18683,      "date_of_publication": "2015-01-20 18:01:xx",      "headline": "27 cases in Hyderabad, 1 death in Punjab",      "main_text": "While an outbreak of swinefl has claimed one life in Punjab, as many as 27 people in Telanganas capital Hyderabad have tested positive for the H1N1 virus, and their treatment is underway at the Gandhi Hospital here, while 35 cases are under observation for suspected influenza.\nRead Full Article At :: http://www.ddinews.gov.in/National/National%20-%20Headlines/Pages/Swineflu27casesinHyderabad,1deathinPunjab.aspx",    }  ]}
```

2 Testing Environment

The testing environment we used is coupled with the tool that we used, being Postman. Postman allows for quick creation of requests, with multiple tests running on those requests. Through this we were able to create a comprehensive test suite, with all possible cases of requests that can be made to our API and a variety of tests performed on each case. These tests checked data such as the response code and the body of the response to check that it is correct.

Also, Postman allows for us to have a team workspace, which means we can collaborate on the creation of the tests. If anyone wanted to add extra tests to the test suite they would change the collections in the team workspace to include those tests. They would also need to export the collections to the GitHub, as there is no way to sync between exported collections and online collections.

3 Limitations

3.1 Security

We do have some limitations in our testing suite however, due to difficulty of creating the tests. We were unable to perform any security related tests, such as penetration testing, as none of us have an understanding of how to perform automated penetration tests. If this API was to go public and be used outside of this university course we would invest some time in making sure our API has rigorous security measures.

In saying that, as our API is only serving data and not recording any user related state, we do not perform any authentication. So the need for security in this API is low.

3.2 Performance

We were also unable to check the performance of our API within the automated test suite for various factors. One of those factors is that the time it takes to send the response is dependent on how much data the user has requested. If we had implemented some kind of pagination into our API then this might have been possible, but due to time constraints we were unable to add that.

Also, with the constantly updating data from the web scraper the size of the response may change, meaning that we would be unable to predict what the performance would be like.

Despite this, we are able to test the performance manually through Postman, as postman is able to tell us the response time of the request. Ideally this would be automated as the rest of our tests are, but manual testing will at least be able to ensure that our API responds in a timely manner.