Restful Web Service and Web App

Version 1.1

December 2, 2020

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Project Members & Assignments

Project Manager:	Meetkumar J. Patel
Software Developer:	David T. Lascelles
Software Developer:	Neeyati S. Ajmera
Quality Assurance:	Christian B. Batach
Business Analyst:	Jaskaranpreet S. Sidhu

Project Objective

Given that the overall class project is to create a Fake News Detector Service, the goal of this team is to design and implement a RESTful Web Service and Web App.

In regard to the RESTful web service, it supports POST requests in JSON objects for either a Facebook Native App or Twitter Native App. Followingly, the web service extracts the provided information and executes web scraping on the news article url provided. After successful completion, the web service combines the provided information with its gathered content via web scraping in one JSON object to make a POST request to one of the fake news detection services — either Artificial Neural Network or Rule Base. Once it receives the response of authenticity score from the respective fake news detection service, it relays back such response information to the respective client.

There's a similar story for the article submission web app. The primary difference is that the data received is only the URL to a news article from a webpage. The web scraping portion and POST request to fake news detection service, as described in RESTful web service, is executed following the input of URL on the specified web page. Once the response of authenticity score is received, it is displayed back on the client's webpage.

The entire specific, detailed protocol is specified in the Project Release Notes section.

The web application is available at: https://naws.herokuapp.com/

The connection to the RESTful web service is possible at: https://naws.herokuapp.com/api

Project Charter

(CPP Computer Science Department – RESTFUL Web Service & Web App)

Updated (09/30/2020) - Version (1.1)

Project Name	RESTFUL Web Service & Web App	
Executive Sponsor	Mr. Zaidi, Hussain	
Project Manager	Mr. Patel, Meetkumar	
Primary Stakeholder(s)	Mr. Zaidi, Hussain	
Project Description / Statement of Work		
Design and implement a restful web service and web app for the Fake News Detection Service project.		
Business Case / Statement of Need *(Why is this project important now?)*		
Given the increasing trend of misrepresentation and lying in news in the past few years, it is essential to develop and market a service that reliably distinguishes accurate news from false ones.		
Customers	**Customer Needs / Requirements**	
Mr. Zaidi, Husain	RESTFUL Web Service & Web App	
Project Definition		
Project Goals	Implement a functional RESTful Web Service and Web App Interface	
Project Scope	Develop a RESTful web service that provides API functionality to applications for determining news credibility. The API obtains credibility through service such as ANN and relays back the answer. Additionally, implement a web app where user could provide URL and request for news credibility similar to the RESTful web service's API.	
Project Deliverables	RESTful Web Service and Web App, Documentation with relevant diagrams.	
Project Constraints / Risks *(Elements that may restrict a project, project team, or project action)*		
Given the virtual circumstances due to COVID-19, meeting in-person is not feasible. There is also a learning curve for implementing such systems and creating diagrams for documentation purposes.		
Implementation Plan / Milestones) *(Due dates and durations)*		
Agile methodology will be used with a total of three sprints, each lasting three weeks. The first sprint is from September 16 to October 06. The second sprint is from October 07 to October 27. And the last sprint is from October 28 to November 17, 2020. The aim is complete research and skeleton code by sprint 1 and have the functional implantation by the end of second sprint. The third sprint will be primarily for testing and documentation purposes.		
Communication Plan *(What needs to be communicated? When is communication needed? To who? How?)*		
Discord, GitHub, and Google Drive are primarily used for sharing files and discussion. Mainly, communication between team members is needed and is accomplished via weekly Monday evening meetings on Zoom.		
Change Management / Issue Management *(How decisions will be made? How changes will be made?)*		
All the needed decisions to make will be discussed in a group meeting and decided via majority vote. If a significant change is necessary, project manager will decide and discuss with appropriate stakeholders. GitHub is used for source control with main collaborators being developers and project manager.		
Project Team Roles and Responsibilities		
Team members	**Roles**	**Responsibilities**
Lascelles, David	Developer	Implement RESTful Web Service
Batach, Christian	Quality Assurance	Test Strategy/Plan/Cases and Results Summary
Ajmera, Neeyati	Developer	Implement Web App
Sidhu, Jaskaranpreet	Business Analyst	Use cases, Activity Diagrams, DOM
Patel, Meetkumar	Project Manager	Manage, communicate, document, help members
Stakeholder Roles and Responsibilities		
Stakeholders	**Roles**	**Responsibilities**
Mr. Zaidi, Husain	Sponsor / Stakeholder	Provide evaluation of the project.

Sign-off

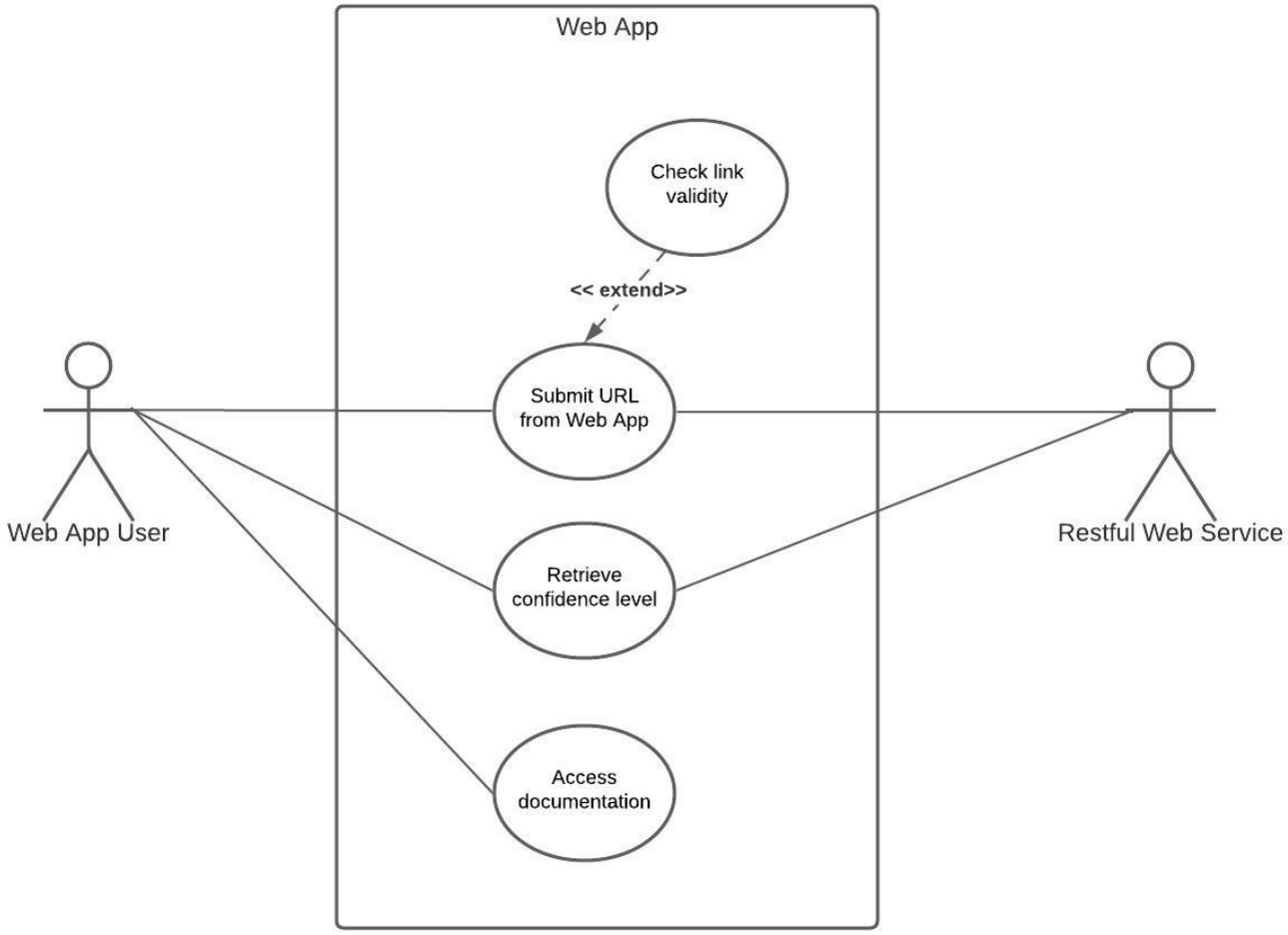
Sponsor : *Mr. Zaidi, Husain* **Date:** *09/30/2020*

(Name)

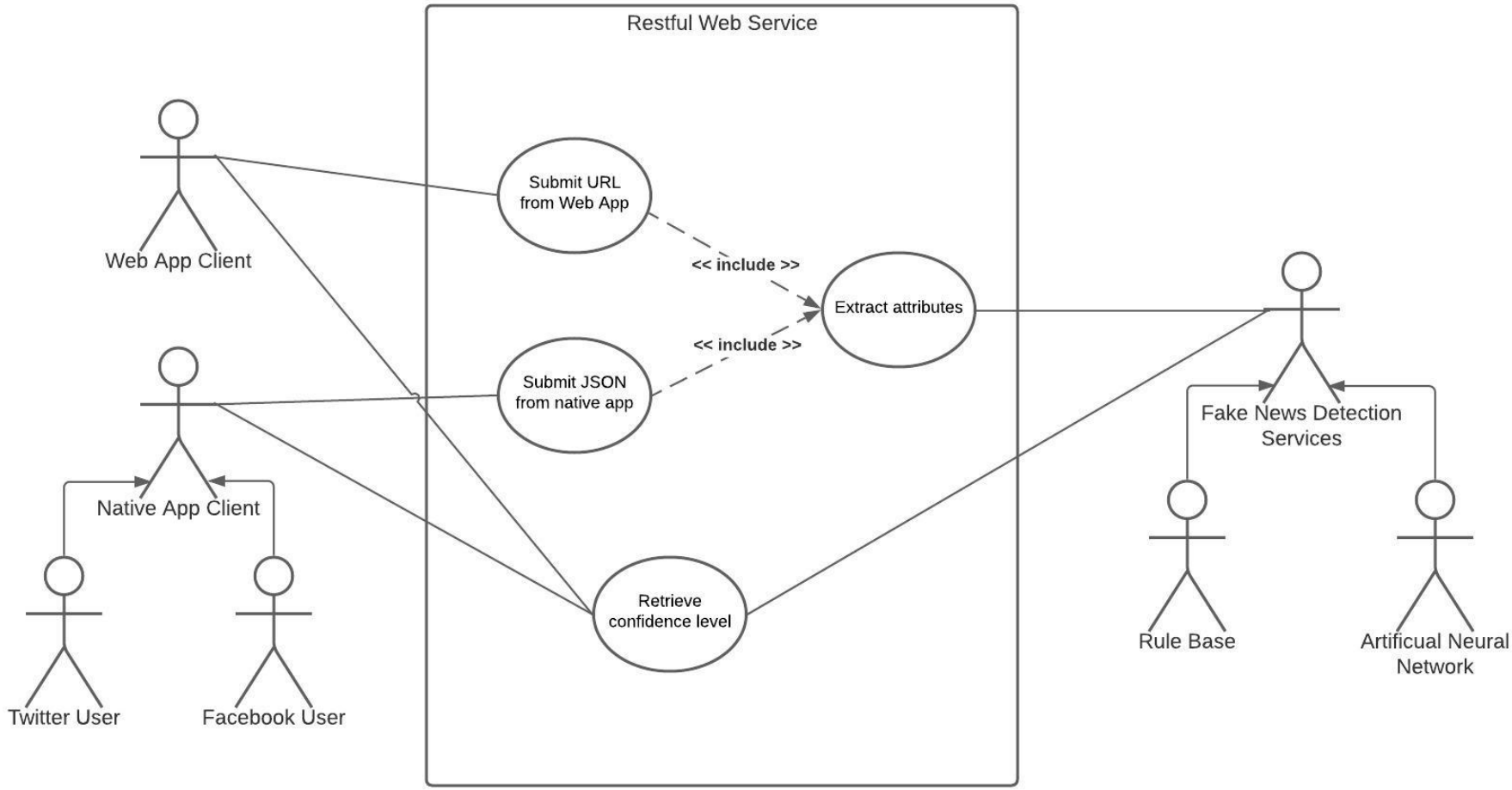
Requirement Specifications – Software Modeling

Use Case Diagrams

Web App

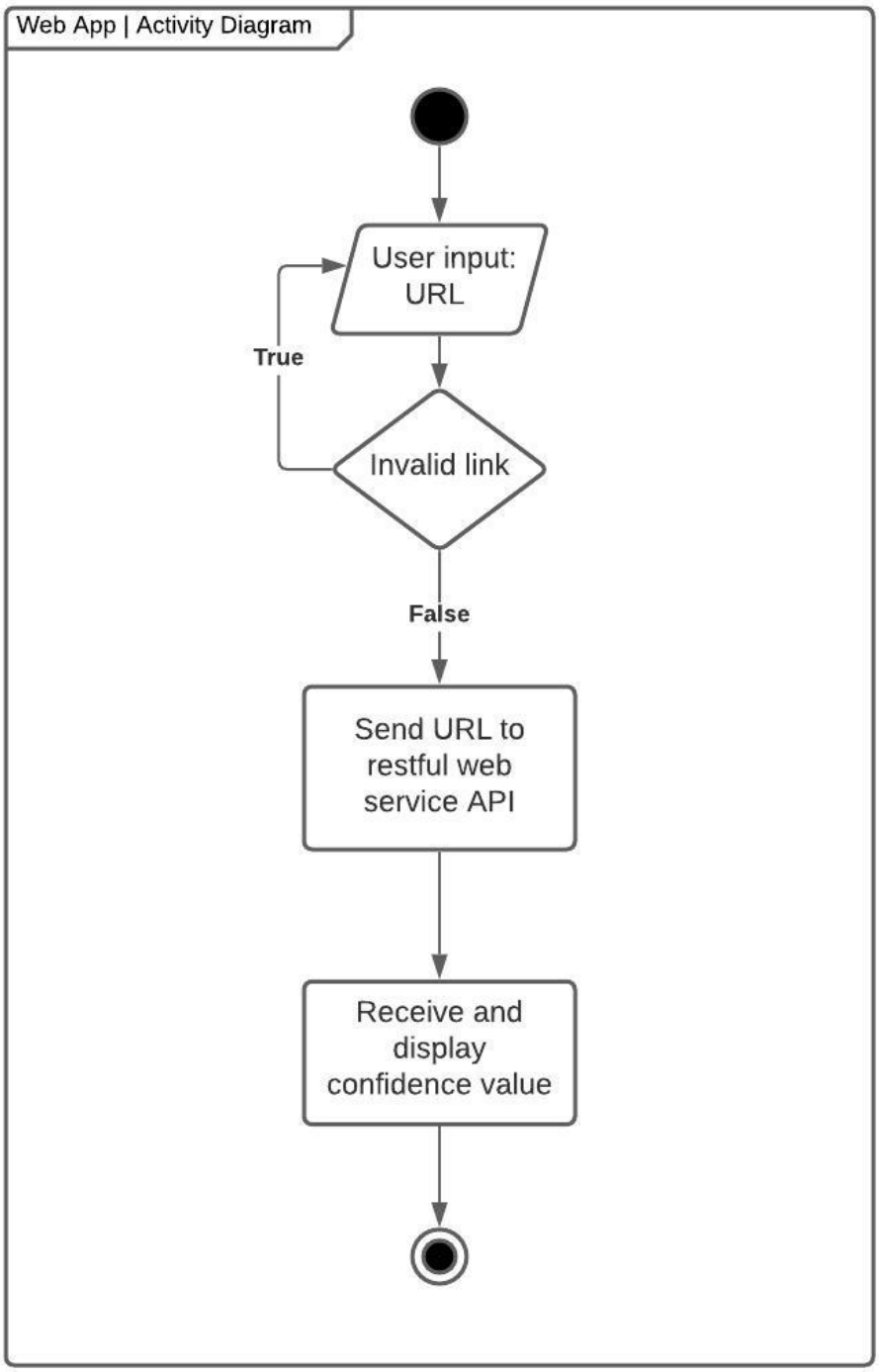


Restful Web Service

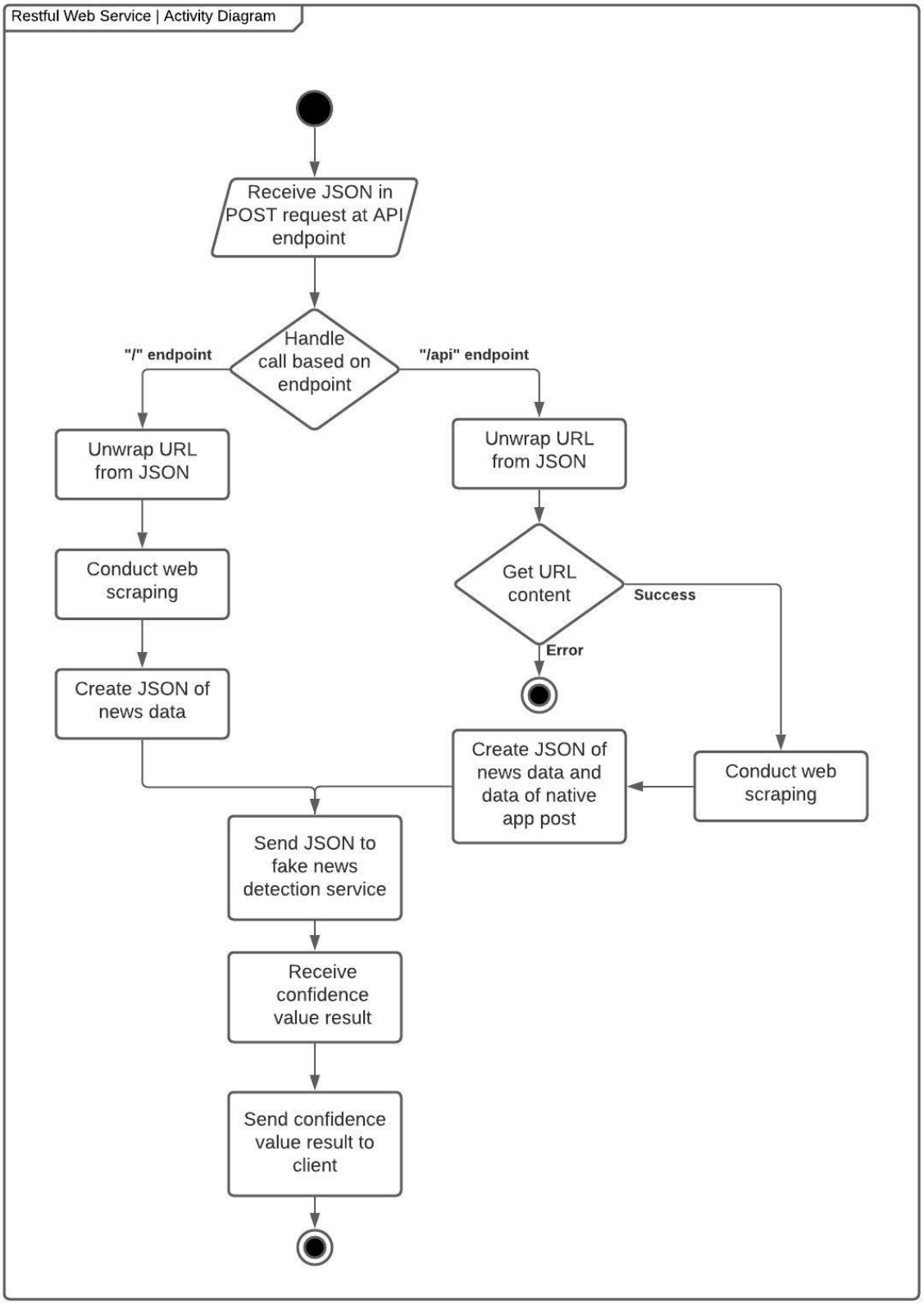


Activity Diagrams

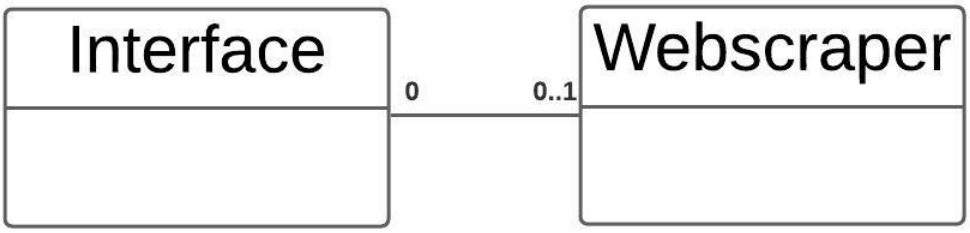
Web App



Restful Web Service



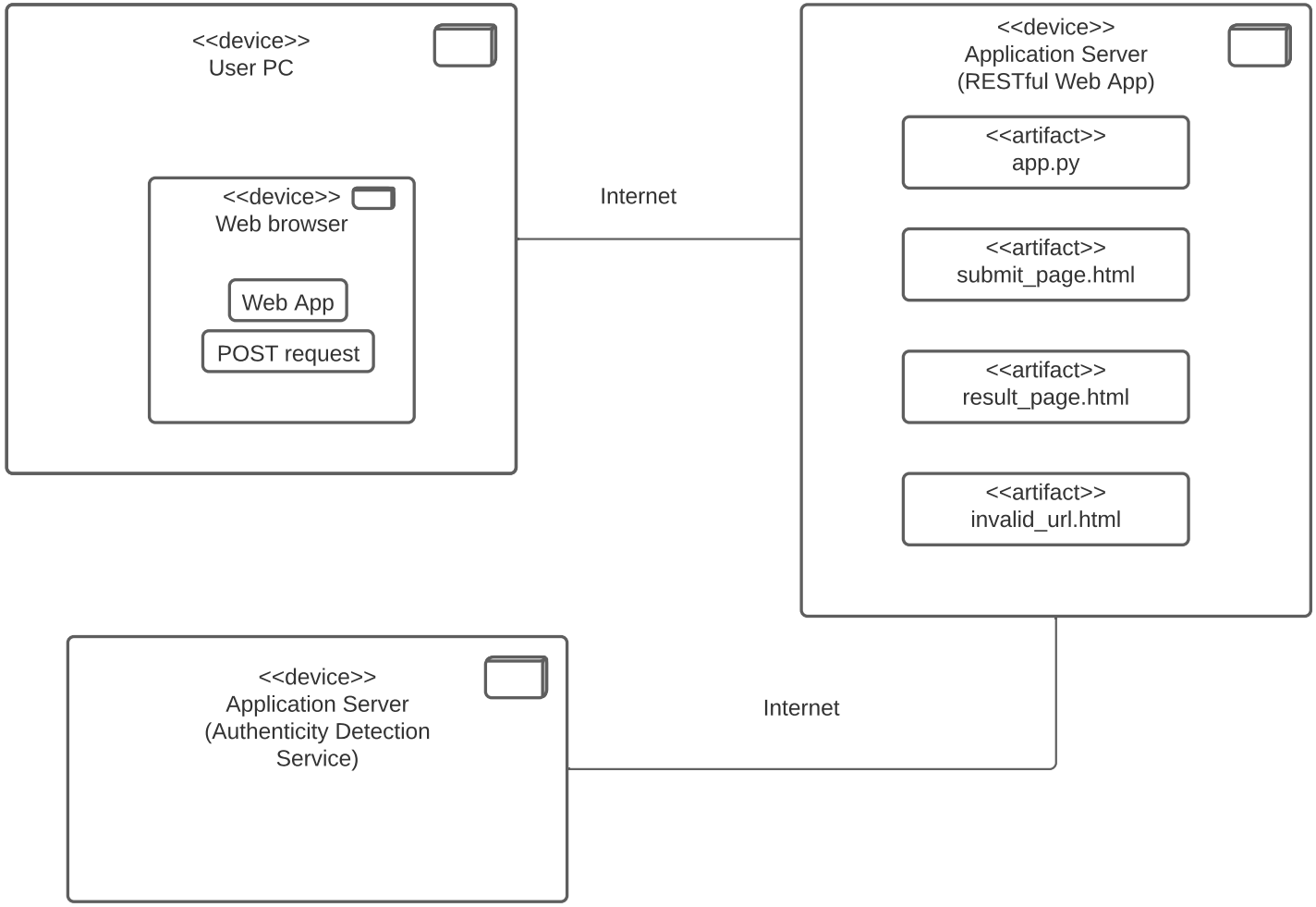
Domain Object Model Diagram



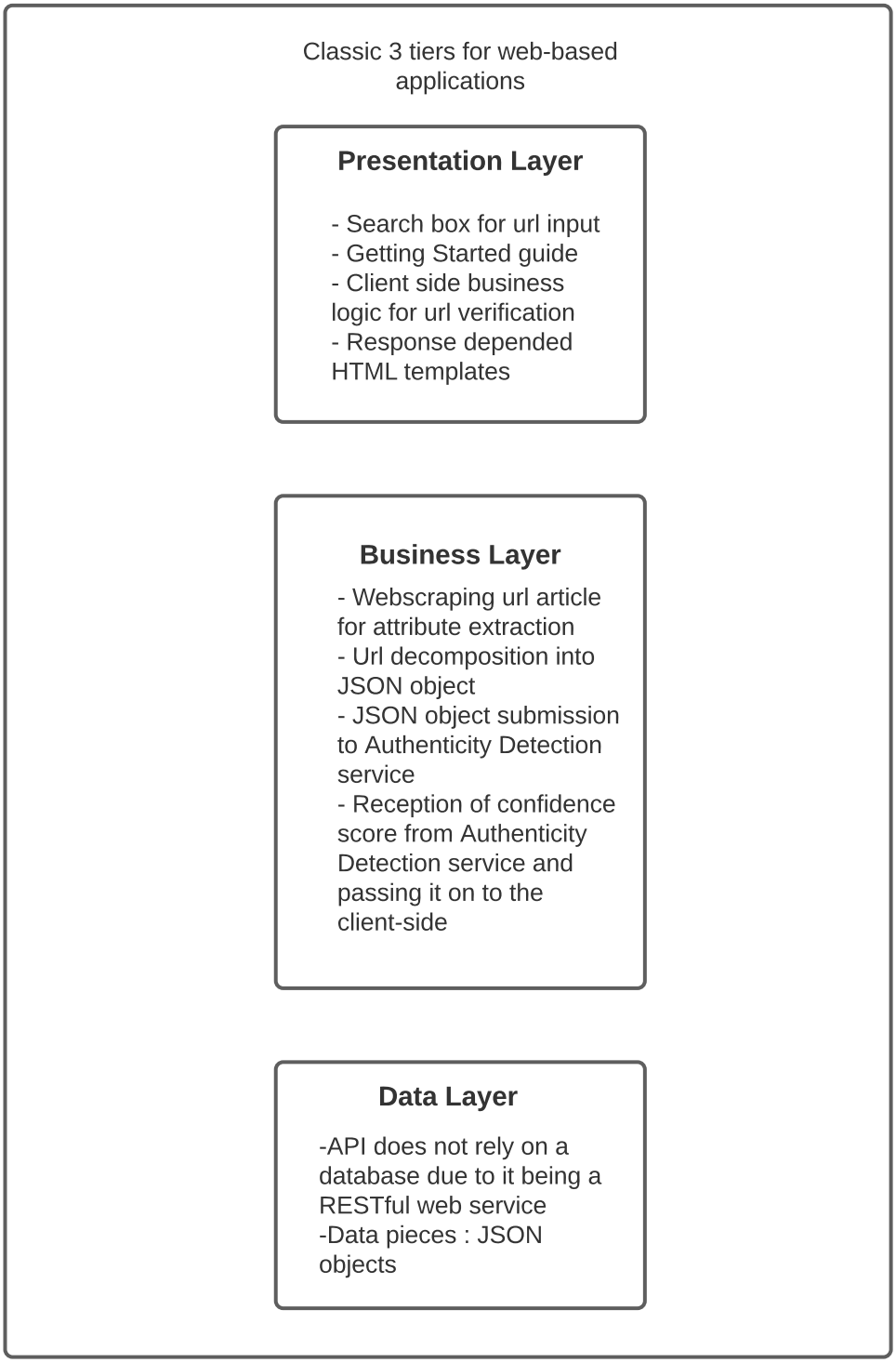
This domain object model shows that the Interface class can either create 0 or 1 Webscraper objects, depending on the Interface method that is called. The Webscraper class does not create any Interface objects, therefore the multiplicity is 0.

Technical Design Specifications

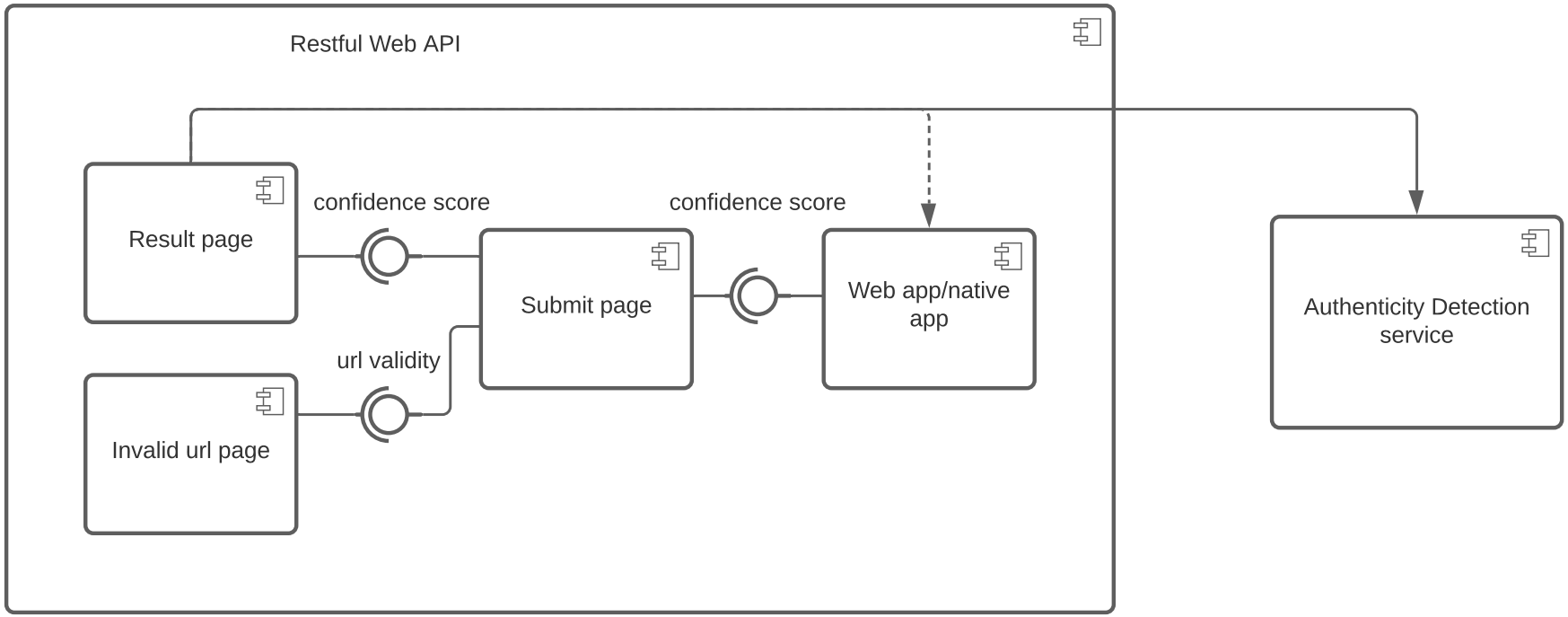
Context (Deployment) Diagram



Architecture Layout

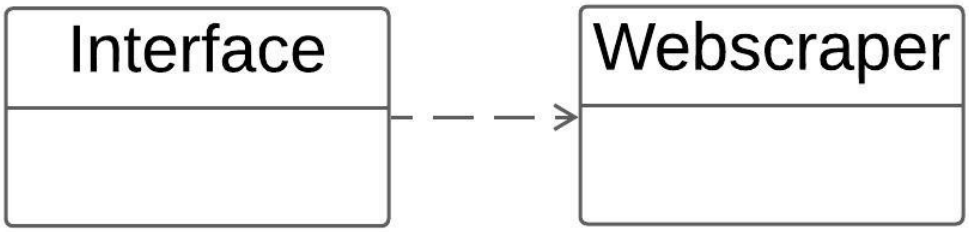


Component Diagram



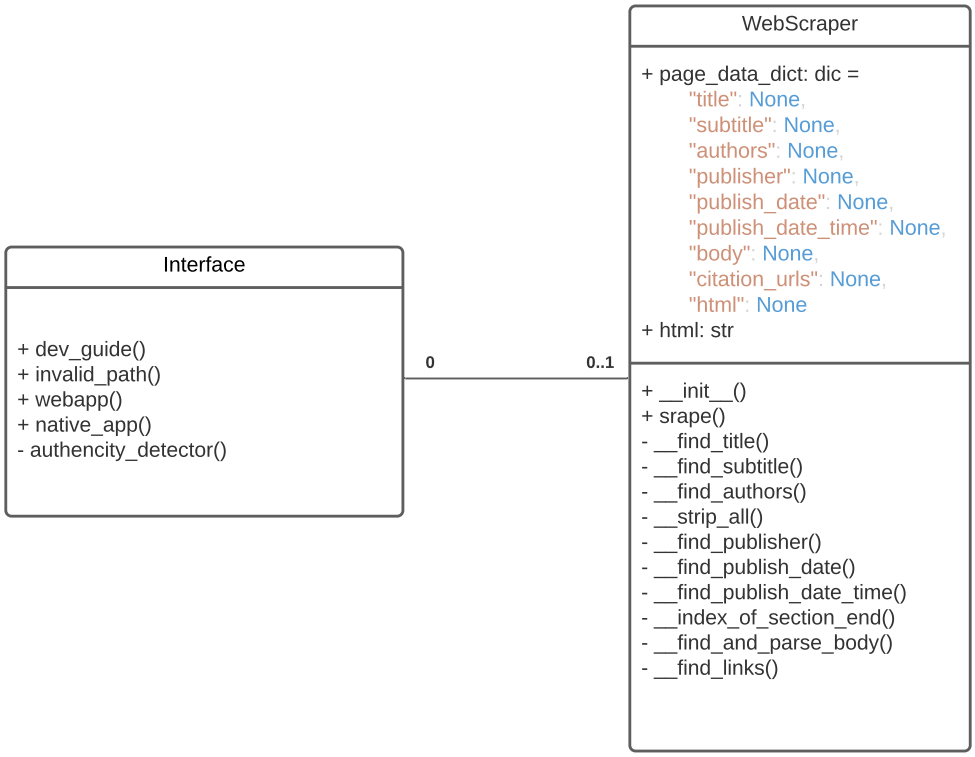
Class Hierarchy & Relationship Diagram

Class Relationship Diagram



In regard to class hierarchy and relationships between classes, the Webscraper class depends on the Interface class, as the only way Webscraper objects are created is through certain methods in the Interface class.

Design Class Diagram



Sequence Diagram

The sequence of events for our webservice involves users of the service, our API and its internal components `Interface` and `Webscraper`, as well as an external authenticity detection service entity. The `Interface` class handles all external interactions with the API, including URL calls from webapps and native apps, as well as `POST` requests to third party authenticity detection entities. The `Webscraper` class handles web scraping and classification of news websites, used to create the `POST` request to the detection services. First, users access the API through an API call at a URL endpoint. The four URL endpoint paths that the API handles are shown in the UML Boundary labeled API below in Figure 1. The four URL path options are "`/`", "`/api`", "`/invalid_url`", and "`/dev`".

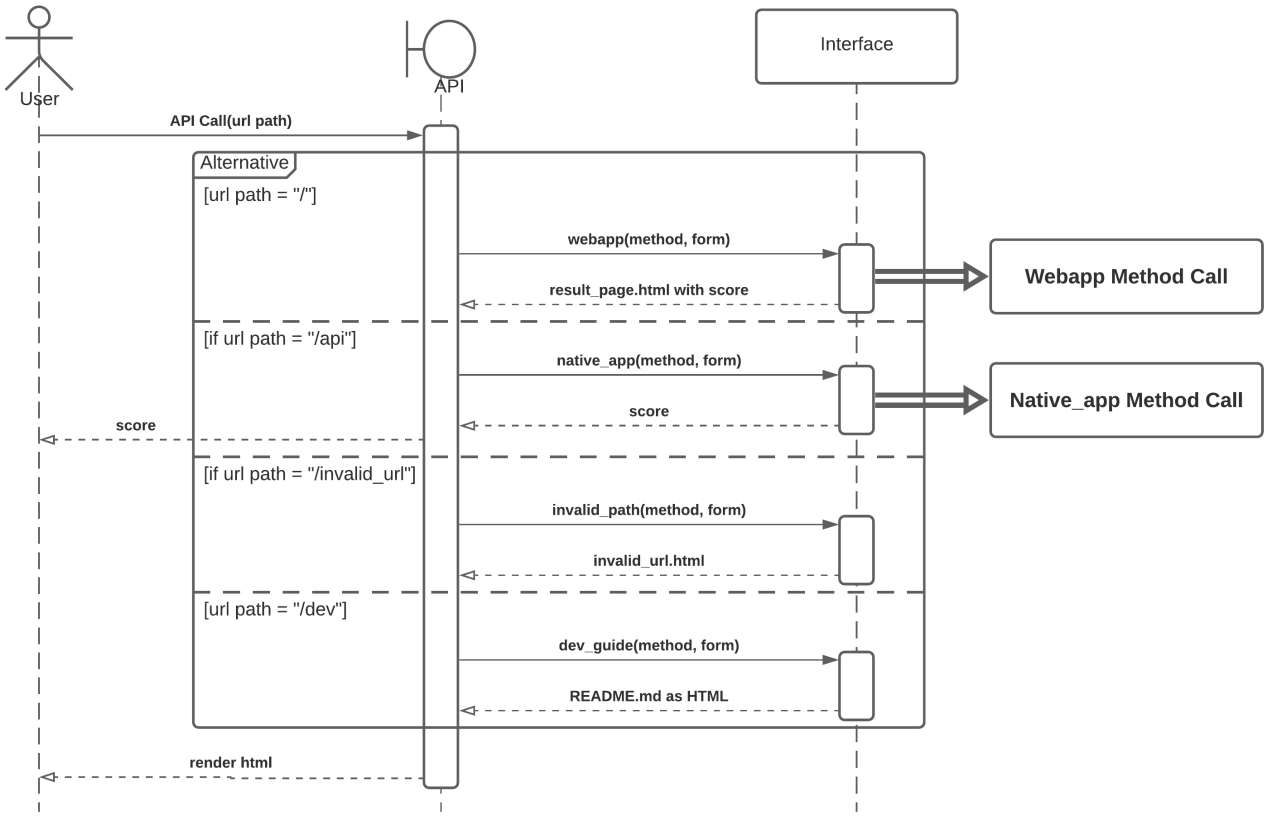


Figure 1

When handling both the "`/invalid_url`" and "`/dev`" paths, the API creates an `Interface` object, and the `invalid_path()` and `dev_guide()` methods are called respectively. The API's `Interface` object will then simply return the `invalid_url.html` or `README.md` files, which are then returned from the API to be rendered for the webapp user accessing these API URL endpoints.

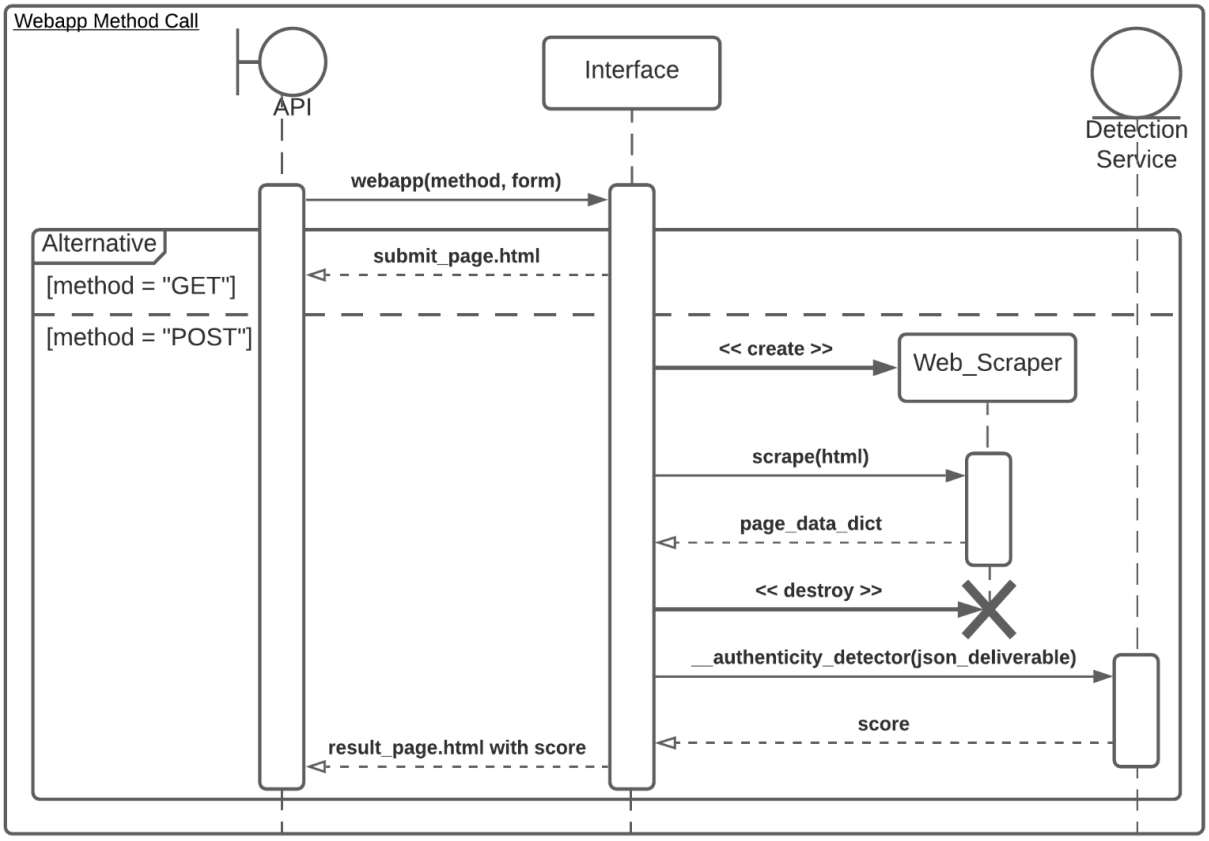


Figure 2

For the webapp, if the "`/`" endpoint is accessed, the API creates an `Interface` object and calls the `webapp()` method. The `webapp()` method call is diagramed in more detail in Figure 2. First, the `Interface` object responds to `GET` requests by returning the homepage of our webapp, and `submit_page.html` is rendered. This is where a user can make a `POST` request containing a URL. If the `webapp()` method is handling a `POST` request, it creates a `Webscraper` object, calls the `scrape()` method which returns a dictionary back to the `Interface` object, and the `Webscraper` object is destroyed. The `Interface` object then makes a call to the external authenticity detection service entity with a JSON containing the

requisite data, and a floating-point score is returned. The Interface object then returns an HTML page with the score to the user to be rendered.

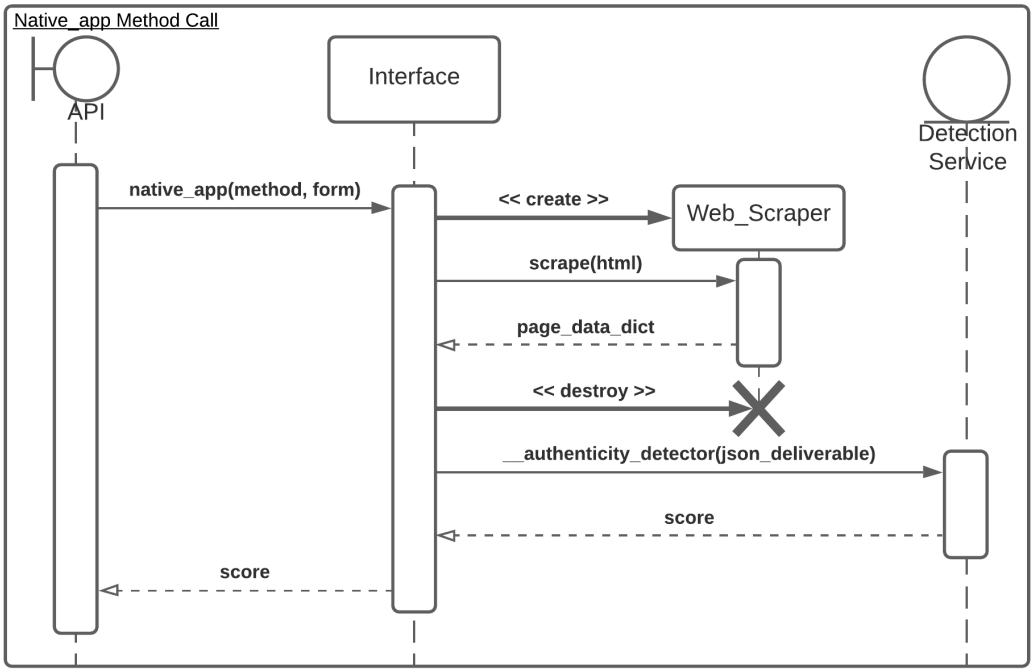


Figure 3

If the API is accessed through the "`/api`" endpoint by a native app, an `Interface` object is created and the `native_app()` method is called. The `native_app()` method is diagramed in more detail in Figure 3. Similarly to the webapp flow, the native_app() method handles POST requests the same way; by creating a Webscraper object, then contacting the external detection service entity for a score. The difference, however is the native_app() method returns only the floating-point score without an HTML webpage to be rendered, as the native apps using this API will create their own interface for displaying the authenticity score.

Test Case Specifications

Applied software testing strategy

- Agile testing focused on:
  - Unit testing
    - Bottom-up tests with Web App
  - Integration testing
    - Between Web App and Restful Web Service
  - Validation testing
    - Functional testing
    - Alpha testing in collaboration with developers

Test Strategy / Approach

We are testing two different modules: the Web App and the Restful Web Service (RWS). We are following an agile software development process, divided into three sprints of three weeks each. Therefore, we will perform tests at the end of each sprint during the last week (subject to change based on development progress). Then, errors will be fixed or improved during the following sprint. Before testing begins, we have developed a traceability matrix with requirements and test cases. The traceability matrix will be further developed during each sprint, expanding in case new requirements emerge. Direct quality factors related to code issues, bugs, errors, etc. will be tested first. These will consist of unit testing and design testing. Unit testing will be performed on each individual module (Web App and RWS) and design testing will apply to the integration between both modules following a bottom-up integration approach. If possible, we will also implement integration tests related to modules other teams are working on (Social Media clients, Neural Network, and Knowledge Based. Secondarily, we will test for indirect quality factors such as user-friendliness and navigation errors. Finally, given the scope of our project we will not implement system testing, opting instead to validate through functional and alpha testing.

Test plan

Overview

- **Input Fields**
  - Ease of use
  - Link validation
    - Code integration (HTML, CSS and Python)
    - Unexpected input
      - Non-URLs
      - Domain name typos (i.e. con instead of com)
      - Non-news websites
- **Attribute extraction**
  - Fields extracted correctly
  - Attribute names
    - Increase attributes testing different websites
  - JSON object storage
- **Functionality and Communication**
  - Code Integration
    - POST requests and results retrieval
      - Bottom-up: from Web App and Social Media clients
      - Top-down: to Neural Network and Knowledge Based services
  - Retrieval of results
    - Integration with Neural Network and Knowledge Based services
      - Agreement on arithmetic precision (number of decimal places)
  - Deployment
    - Response time
    - Live testing
    - If necessary: integration with static websites such as GitHub
- **User interface**
  - Friendliness
    - Element alignment
    - Wording consistency and uniformity
    - Display of results
      - Number of decimal places
      - Explanation of results (if provided by Neural Network and Knowledge Based services)
  - Readability, usability, navigability, and accessibility
    - Testing buttons, actions, fields

Test plan per Sprint

Sprint 1 (Testing from October 3th to 6th)*

Aspects tested:

- Input Fields
  - Ease of use
  - Link validation
- User interface
  - UI Friendliness
  - Readability, usability, navigability, and accessibility

Sprint 2 (Testing from October 24th to 27th)*

Aspects tested:

- Attribute extraction
  - Fields extracted correctly
  - Attribute names
  - JSON object storage
- Functionality and Communication
  - Code Integration
- User interface
  - Readability, usability, navigability, and accessibility

Sprint 3 (Testing from November 14th to 17th)*

Aspects tested:

- Attribute extraction
  - Additional attribute names
  - JSON object storage
- Functionality and Communication
  - Code Integration
  - Deployment
- User interface
  - UI Friendliness
    - Specifically: display of results
  - Readability, usability, navigability, and accessibility
- Communication with other modules
  - Test only if possible (i.e. source code available)
  - API communication and integration with Neural Network and Knowledge Based
- Sprint 3 ends on November 17th which allows for a 2-week buffer before final presentation to fix errors found at the end of the sprint if necessary.

***** Dates subject to change

Requirements and Test Cases

Web App

Note: News Authenticity Detection Services = Neural Network or Knowledge Based services

	Requirements
Req 1.1	Receive URL from Web App user
Req 1.2	Check link validity
Req 1.3	Make a POST request to Restful Web Service
Req 1.4	Retrieve/Display confidence level from News Authenticity Detection Services
Req 1.5	Allow documentation access | 'Developer Guide' URL

	Test cases
TC 1.1	Ensure all HTML files are rendered
TC 1.2	Ensure CSS file is rendered
TC 1.3	Check response when search bar is empty and magnifying glass button is pressed
TC 1.4	Confirm URL format accuracy and response
TC 1.5	Code Integration
TC 1.6	User friendly interface (readability and accessibility)

Restful Web Service

	Requirements
Req 2.1	Receive POST request from Web App
Req 2.2	Receive POST request from social media native app in JSON object
Req 2.3	Extract attributes
Req 2.4	Make a POST request to News Authenticity Detection Services
Req 2.5	Retrieve result score from respective News Authenticity Detection Services
Req 2.6	Send result score to either Web App or Social Media Clients
Req 2.7	Deploy Restful Web Service and Web App

	Test cases
TC 2.1	Ensure specified URL response code is 200 when accessing URL to extract information
TC 2.2	Check if there's information to extract
TC 2.3	Check that output is null when attribute is not found or extracted
TC 2.4	API communication with News Authenticity Detection Services
TC 2.5	Check results on entering a valid URL
TC 2.6	Check correct deploy settings

Traceability Matrix

Requirements		Req 1.1	Req 1.2	Req 1.3	Req 1.4	Req 1.5	Req 2.1	Req 2.2	Req 2.3	Req 2.4	Req 2.5	Req 2.6	Req 2.7
Tests Cases	Totals	3	2	1	4	4	3	2	4	2	1	2	3
TC 1.1	2				X	X							
TC 1.2	2				X	X							
TC 1.3	1		X										
TC 1.4	2	X	X										
TC 1.5	4	X		X	X	X							
TC 1.6	3	X			X	X							
TC 2.1	4						X	X	X				X
TC 2.2	3						X	X	X				
TC 2.3	2								X			X	
TC 2.4	2									X			X
TC 2.5	5						X		X	X	X	X	
TC 2.6	1												X

Test Results Summary

Sprint 1

Results | Test Cases

Test Case	Description	Last Executed	Type	Execution Status
1.1	Ensure all HTML files are rendered	October 5	UI	Passed
1.2	Ensure CSS file is rendered	October 5	UI	Passed
1.3	Check response when search bar is empty and magnifying glass button is pressed	October 5	Input	Passed
1.4	Confirm URL format accuracy and response	October 5	Input	Passed
1.6	User friendly interface (readability and accessibility)	October 7	UI	Passed

Results | Invalid Links

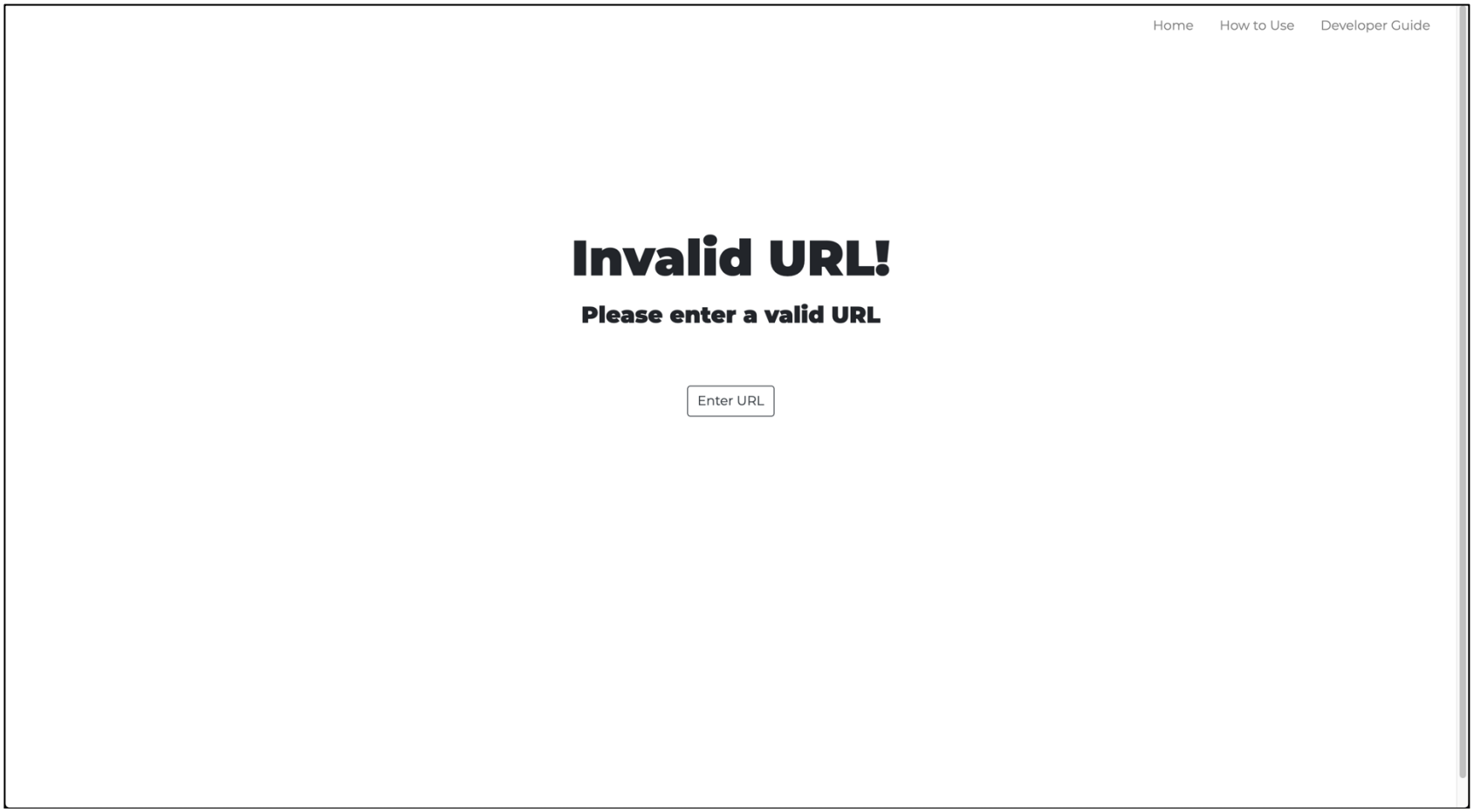
Website URLs or Other tested entries	**Description**	**fail/pass**
'empty URL field'	URL not provided	pass
dfafdjkahfhalfda	Not a URL	pass
https://ktla.con/news/local-news/socal-authorities-preparing-for-possible-unrest-on-election-day/?fbclid=IwAR2z7ORF9edXzdIXYsr4a0YVlYQcb7yI0kdHYJCaGDRxaC8jJgp44BhzvUU	*Typo* .con instead of .com	pass

Results | Summary – October 7th, 2020

All tests passed successfully. Sprint 2 may continue as planned with nothing to be changed.

Results | Screenshots

Results when invalid URL is submitted:



Sprint 2

Results | Test Cases

Test Case	Description	Last Executed	Type	Execution Status
1.4	Confirm URL format accuracy and response	October 24	Input	Failed
1.5	Code Integration	October 24	Functionality	Passed
1.6	User friendly interface (readability and accessibility)	October 24	UI	Passed
2.1	Ensure specified URL response code is 200 when accessing URL to extract information	October 27	Attribute Extraction	Passed
2.2	Check if there's information to extract	October 27	Attribute Extraction	Passed
2.3	Check that output is null when attribute is not found or extracted	October 27	Attribute Extraction	Passed

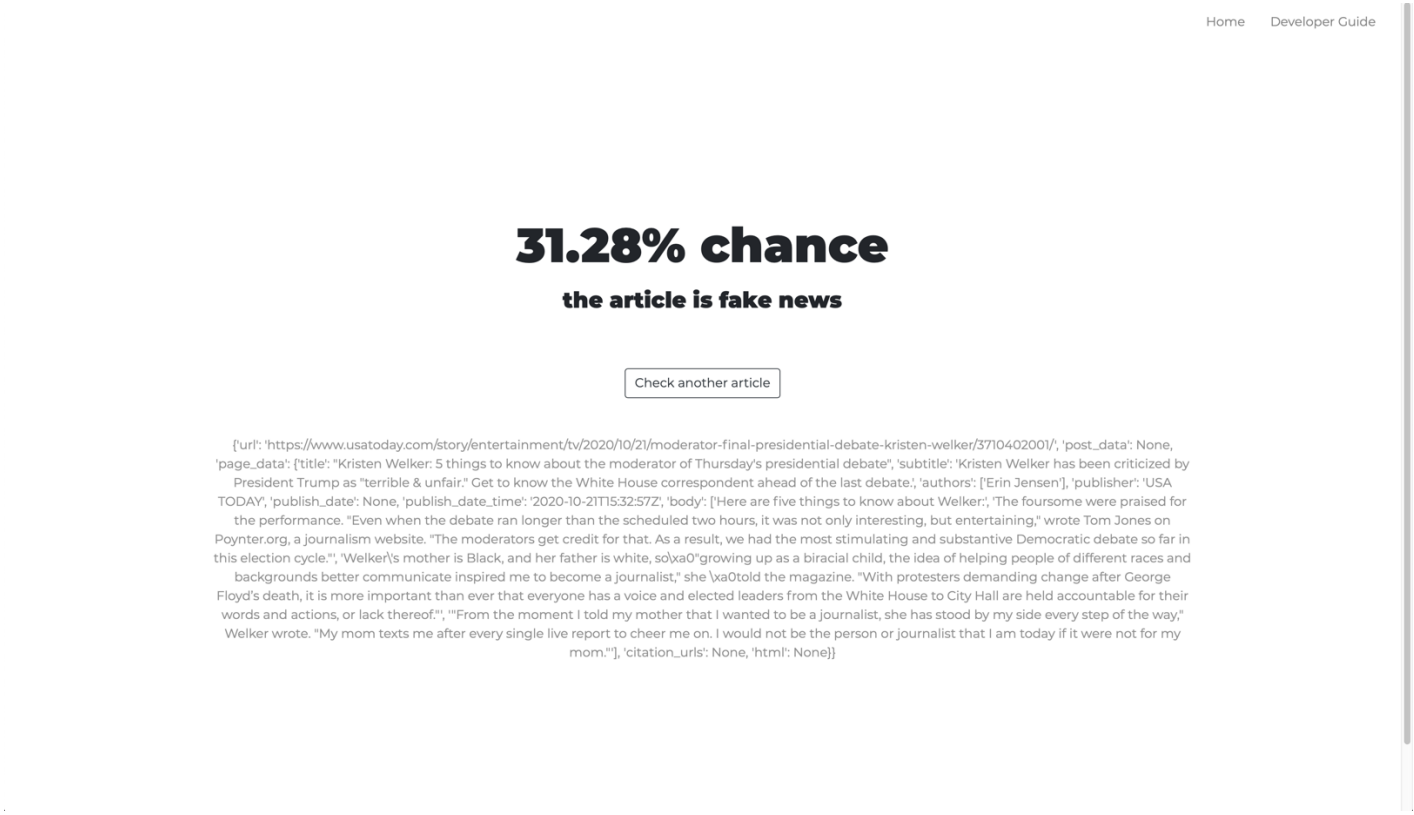
Results | Valid Links

Website URLs	**fail/pass**
https://news.google.com/articles/CAIiEDVTAZ-AiJv2muCA3OsHMe8qGAgEKg8IACoHCAowjtSUCjC30XQwzqe5AQ?hl=en-US&gl=US&ceid=US%3Aen	pass
https://www.thedailybeast.com/mark-meadows-admits-white-house-is-not-going-to-control-pandemic	pass
https://apnews.com/article/03de71eecbb9a605b1efc324cdeb3a5e	pass
https://www.cnn.com/2020/10/25/politics/joe-biden-60-minutes-donald-trump-election/index.html	pass
https://www.foxnews.com/politics/amy-coney-barretts-first-case-as-supreme-court-justice	pass
https://www.wsj.com/articles/facebook-prepares-measures-for-possible-election-unrest-11603651659	pass
https://www.mlive.com/news/saginaw-bay-city/2020/10/michigan-woman-identified-as-us-navy-pilot-killed-in-aircraft-training-crash.html	pass
https://www.usatoday.com/story/entertainment/tv/2020/10/21/moderator-final-presidential-debate-kristen-welker/3710402001/	pass
https://www.facebook.com/ktla5/posts/10159308452919614	pass
https://cointelegraph.com/news/price-analysis-10-21-btc-eth-xrp-bch-bnb-link-dot-ltc-ada-bsv	pass

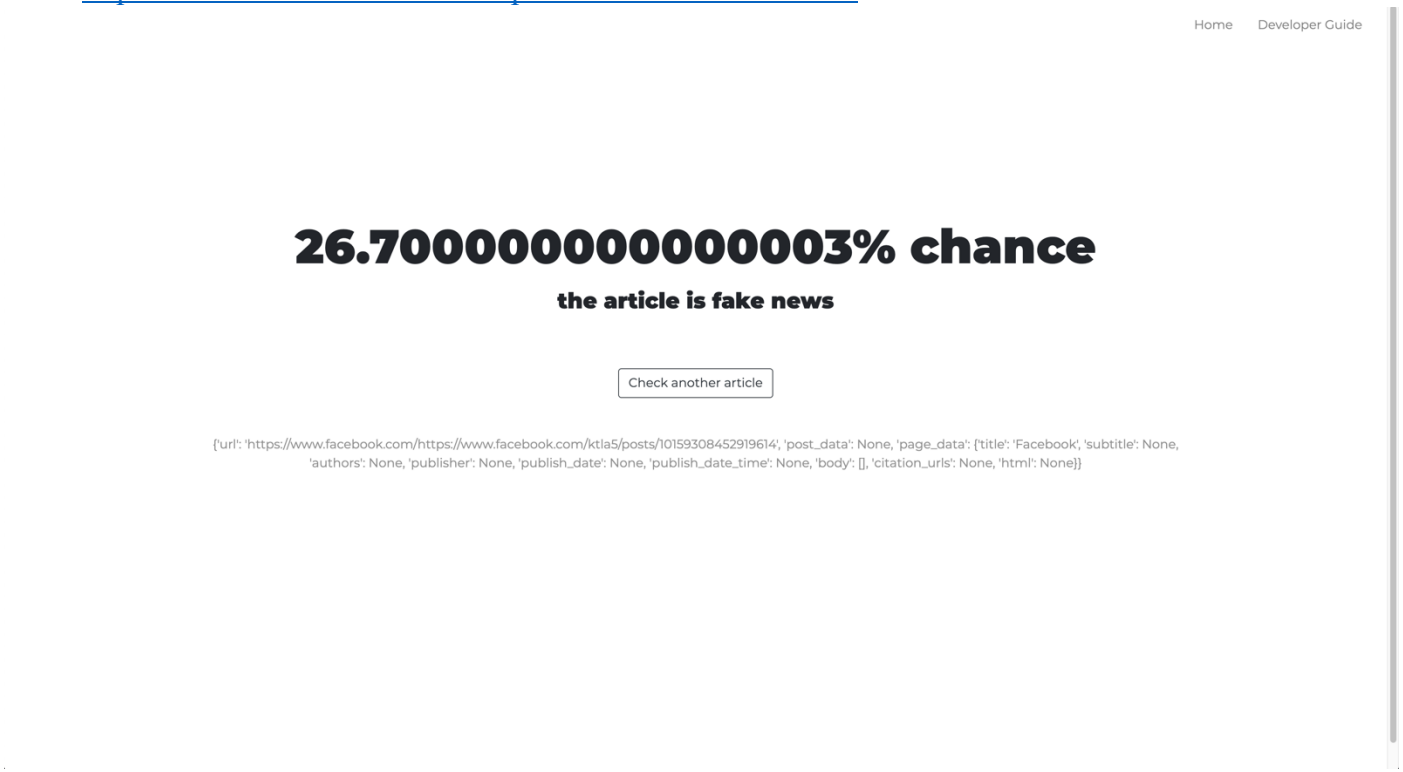
Results | Screenshots

Results when valid URL is submitted (only a few provided as examples):

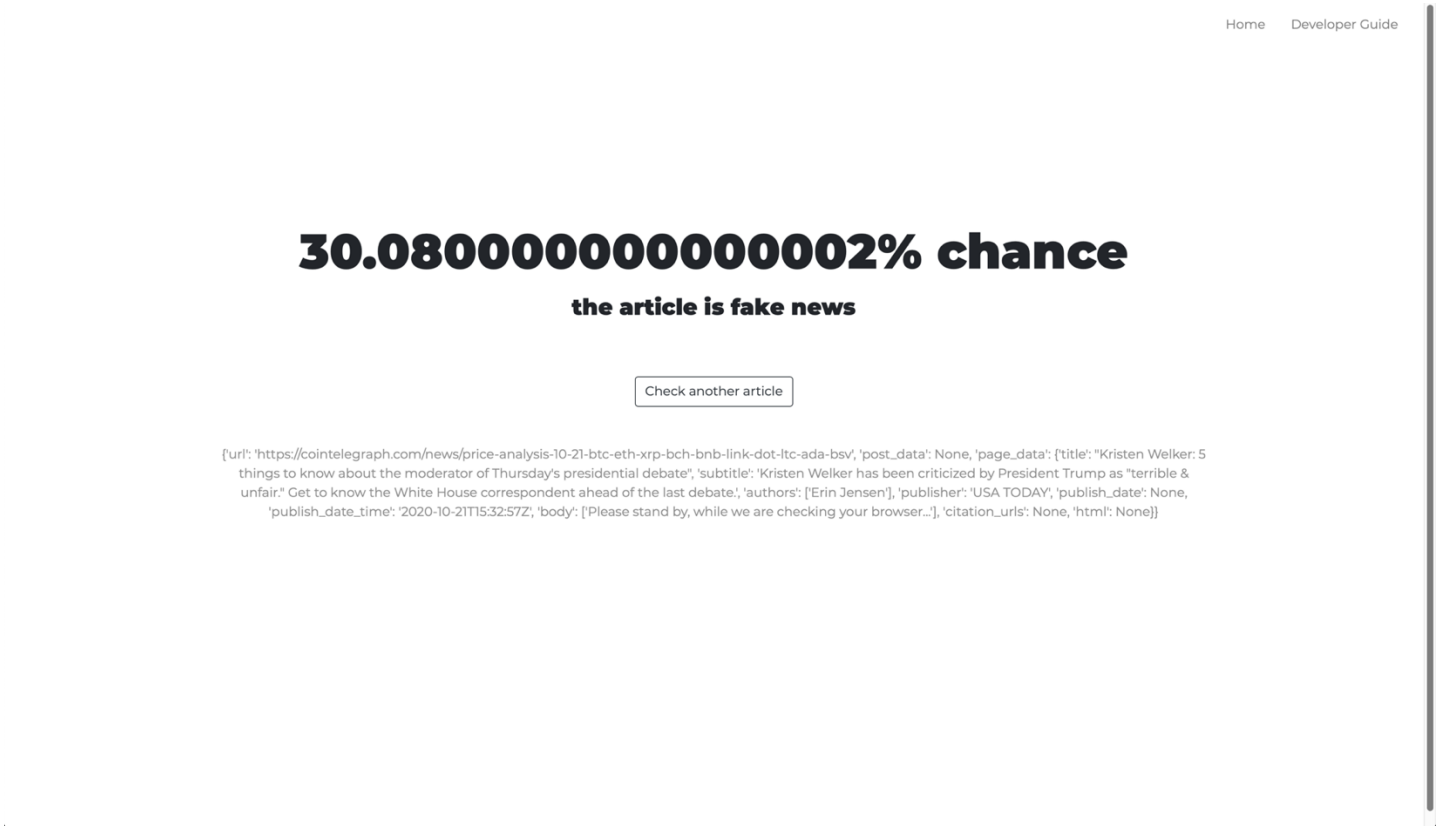
URL: https://www.usatoday.com/story/entertainment/tv/2020/10/21/moderator-final-presidential-debate-kristen-welker/3710402001/



URL: https://www.facebook.com/ktla5/posts/10159308452919614



URL: https://cointelegraph.com/news/price-analysis-10-21-btc-eth-xrp-bch-bnb-link-dot-ltc-ada-bsv



Results | Summary - October 27th, 2020

All links passed with a successful response. TC 1.4 failed because the format of the confidence level contained too many decimal place values, negatively affecting UI friendliness. This error must be fixed in the next sprint so that only the amount of decimal place values that the News Authenticity Detection Services provides is shown. Additionally, the project manager may set a maximum amount of decimal place values to preserve UI friendliness. In that case, developers must ensure the confidence level output complies with that number in the next sprint.

Sprint 3

Results | Test Cases

Test Case	Description	Last Executed	Type	Execution Status
1.4	Confirm URL format accuracy and response	November 17	Input	Passed
1.6	User friendly interface (readability and accessibility)	November 17	UI	Passed
2.4	API communication with News Authenticity Detection Services	-Not available-	Communication	Not executed
2.5	Check results on entering a valid URL	November 17	Functionality	Passed
2.6	Check correct deploy settings	November 17	Functionality	Passed

Results | Valid Links

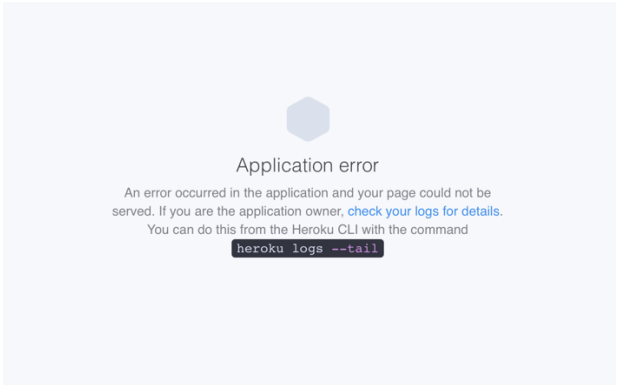
Website URLs	**fail/pass**
https://www.theguardian.com/world/2020/oct/25/chile-referendum-millions-head-to-polls-to-vote-on-constitutional-reform	pass
https://www.npr.org/sections/coronavirus-live-updates/2020/10/25/927637746/europe-imposes-new-restrictions-as-covid-19-cases-soar	pass
https://www.engadget.com/samsung-chairman-lee-kun-hee-dies-151234050.html	pass
https://www.macrumors.com/2020/10/25/google-apple-search-default-8-12-billion/	pass
https://www.ft.com/content/3f567137-0ea4-41e5-93eb-92432f27f4ef	pass
https://www.ajc.com/news/report-ga-based-inspire-brands-in-talks-to-purchase-dunkin-brands/RV4HLZNGEFGDVKNHXE6253FMPA/	pass
https://www.kcrg.com/2020/10/25/icu-usage-for-covid-19-patients-sees-day-to-day-net-decrease/	pass
https://www.espn.com/mlb/story/_/id/30191330/cody-bellinger-back-center-field-los-angeles-dodgers-world-series-game-5	pass
https://www.fieldgulls.com/2020/10/25/21533557/ryan-neal-jordan-simmons-again-start-jamal-adams-mike-iupati-out-seattle-seahawks-week-7-cardinals	pass
https://www.mmafighting.com/2020/10/25/21533339/khabib-nurmagomedov-vs-justin-gaethje-ufc-254-scorecards-2-judges-gave-gaethje-1st-round	pass
https://scitechdaily.com/scientists-peer-inside-an-asteroid-is-bennu-in-the-process-of-spinning-itself-into-pieces/	pass

Website URLs	fail/pass
https://www.factcheck.org/2020/10/trump-on-the-stump-2/	pass
https://www.politifact.com/factchecks/2020/oct/23/donald-trump/no-fight-against-coronavirus-isnt-rounding-corner-/	pass
https://healthfeedback.org/claimreview/masks-are-effective-at-reducing-covid-19-primary-transmission-through-respiratory-droplets-the-cdc-acknowledges-airborne-transmission-via-aerosols-can-also-occur/	pass
https://www.forbes.com/sites/startswithabang/2020/10/21/the-world-needs-nuclear-power-and-we-shouldnt-be-afraid-of-it/#5996c1b86576	pass
https://www.theatlantic.com/ideas/archive/2020/10/could-third-amendment-protect-against-infection/616791/	pass
https://www.cbsnews.com/news/senate-amy-coney-barrett-supreme-court-nomination-final-vote-monday/	pass
https://news.yahoo.com/turkish-president-dares-u-impose-204040309.html	pass
https://www.allure.com/story/gisele-bundchen-wash-face-using-only-water-skin-care	pass
https://www.newscentermaine.com/article/news/politics/maine-politics/president-donald-trump-makes-a-surprise-visit-to-levant-maine-apple-orchard/97-f1da90c2-88af-4e4f-a3fe-c2557eb587f1	pass
https://www.miamiherald.com/news/coronavirus/article246704006.html	fail
https://thehill.com/homenews/news/522667-pope-francis-names-first-black-us-cardinal-wilton-gregory	pass
https://ktla.com/news/local-news/socal-authorities-preparing-for-possible-unrest-on-election-day/?fbclid=IwAR2z7ORF9edXzdIXYsr4a0YVlYQcb7yI0kdHYJCaGDRxaC8jJgp44BhzvUU	pass
https://www.sltrib.com/news/2020/10/25/coronavirus-utah-covid/	pass

Results | Screenshots

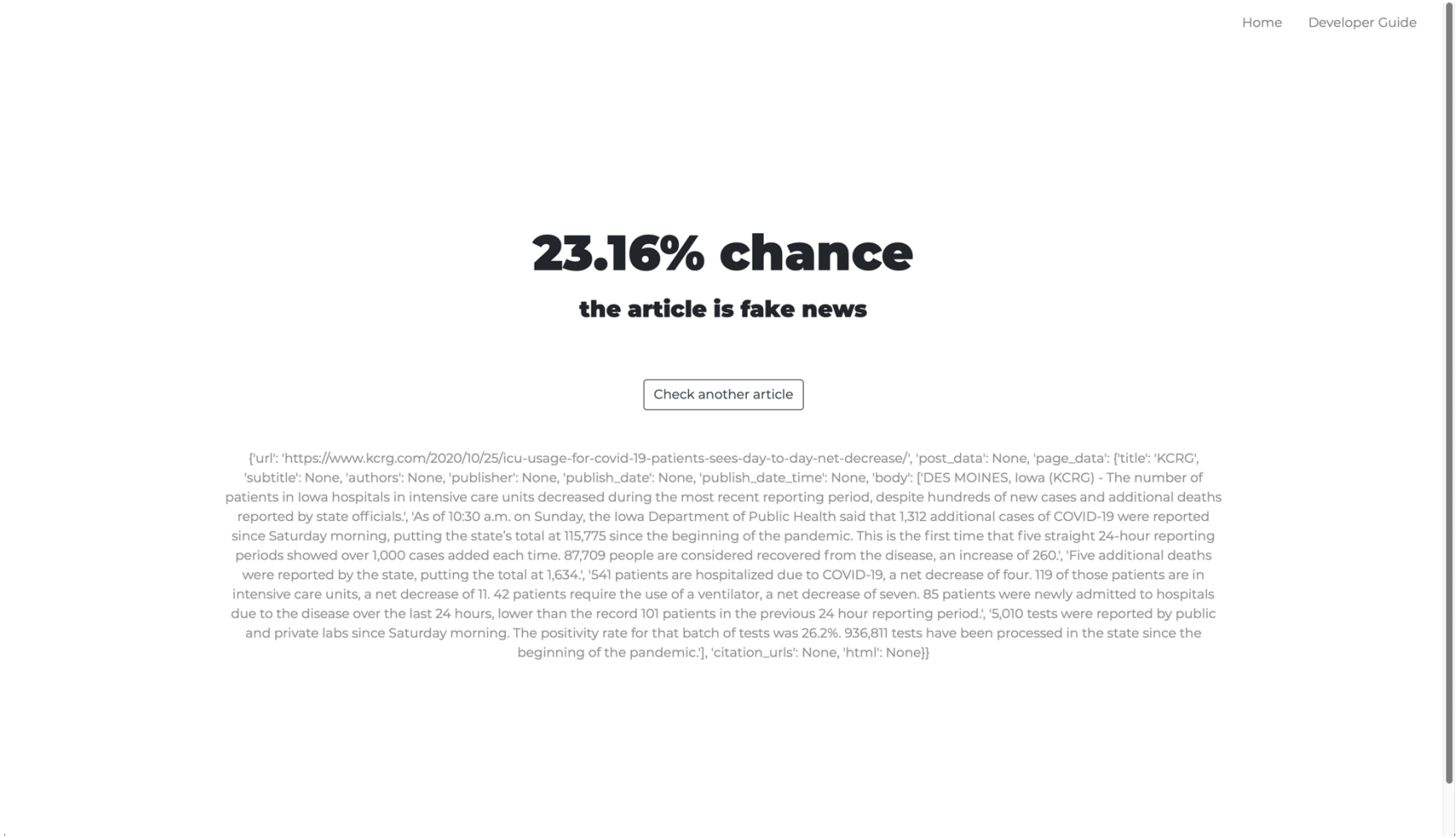
Results when valid URL is submitted (only a few provided as examples):

URL: https://www.miamiherald.com/news/coronavirus/article246704006.html




```
2020-11-10T19:19:42.578608+00:00 heroku[router]: at=error code=H12 desc="Request timeout" method=POST path="/" host=news-authenticity-service.herokuapp.com request_id=5e7fa041-e765-4dee-9eb0-26984e90ca39 fwd="76.89.83.71" dyno=web.1 connect=1ms service=30000ms status=503 bytes=0 protocol=https
2020-11-10T19:19:43.313352+00:00 app[web.1]: [2020-11-10 19:19:43 +0000] [4] [CRITICAL] WORKER TIMEOUT (pid:11)
2020-11-10T19:19:43.320082+00:00 app[web.1]: 10.52.9.178 - - [10/Nov/2020:19:19:43 +0000] "POST / HTTP/1.1" 200 2740 "https://news-authenticity-service.herokuapp.com/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/86.0.4240.183 Safari/537.36"
2020-11-10T19:19:43.320566+00:00 app[web.1]: [2020-11-10 19:19:43 +0000] [11] [INFO] Worker exiting (pid: 11)
2020-11-10T19:19:43.385180+00:00 app[web.1]: [2020-11-10 19:19:43 +0000] [14] [INFO] Booting worker with pid: 14
```

URL: https://www.kcrg.com/2020/10/25/icu-usage-for-covid-19-patients-sees-day-to-day-net-decrease/



URL: https://www.forbes.com/sites/startswithabang/2020/10/21/the-world-needs-nuclear-power-and-we-shouldnt-be-afraid-of-it/#5996c1b86576

13.34% chance

the article is fake news

Check another article

{"url": "https://www.forbes.com/sites/startswithabang/2020/10/21/the-world-needs-nuclear-power-and-we-shouldnt-be-afraid-of-it/#5996c1b86576", "post_data": null, "page_data": {"title": "The World Needs Nuclear Power, And We Shouldn\u2019t Be Afraid Of It", "subtitle": "As we embrace green solutions, nuclear should absolutely be part of the equation.", "authors": ["{'@type': 'Person', 'name': 'Ethan Siegel', 'description': 'I am a Ph.D. astrophysicist, author, and science communicator, who professes physics and astronomy at various colleges. I have won numerous awards for science writing since 2008 for my blog, Starts With A Bang, including the award for best science blog by the Institute of Physics. My two books, Treknology: The Science of Star Trek from Tricorders to Warp Drive, Beyond the Galaxy: How humanity looked beyond our Milky Way and discovered the entire Universe, are available for purchase at Amazon. Follow me on Twitter @startswithabang.'}"], "publisher": "Forbes", "publish_date": null, "publish_date_time": "2020-10-21T02:00:00-04:00", "body": ["For thousands upon thousands of years, humans have been harnessing the power of nature to provide energy to push our civilization forward. By leveraging fire, we gained the ability to cook food, provide warmth and shelter, and to protect us from predators. Later on, we tamed a variety of animals, using their labor to perform tasks that would be too strenuous or inefficient for humans. Eventually, natural power sources, like the wind, was harnessed through windmills to turn millstones, grinding grain without any human input at all.", "An enormous transformation occurred when we began using natural sources \u2014 windmills, steam-generating combustion processes, even flowing water \u2014 to turn turbines, generating power and providing electricity. Today, the world\u2019s energy needs are still dominantly met through these same processes, with non-renewable fossil fuels like coal, oil, and gas providing the dominant fraction of Earth\u2019s energy uses. We\u2019re powering a space age civilization with the same fossil fuels that emerged during the iron age. Now, more than ever, the world needs nuclear power, and yet fear, rather than facts, governs our policies. Here\u2019s the science of why we should embrace it.", "The way a conventional, chemical-based power plant works is simple and straightforward. A fuel source of some variety is burned, releasing energy, which heats up and boils water, generating steam. That steam turns a turbine, which generates electricity, used to provide power for whatever purposes are in demand downstream. ", "The big problem we have, whether we admit it to ourselves or not, is that this way of generating large amounts of energy has created enormous environmental problems. While the impact of extracting these raw materials in such enormous quantities is no doubt significant, the end products of combusting these fuel sources has fundamentally and significantly changed the chemical composition of Earth\u2019s atmosphere and oceans, leading to global warming, ocean acidification, and other climate-related effects. ", "This carbon dioxide increase also extends to the ocean, where carbon dioxide combines with water to create carbonic acid, changing the pH (a measure of acidity) of our oceans on a global scale.", "But the most pressing problem is the global warming that has ensued from this additional amount of carbon dioxide. Our global average temperature has risen by 0.98 \u00b0C (1.76 \u00b0F) since we began accurately measuring it back in 1880, and that rise has accelerated, having increased by 0.18 \u00b0C (0.32 \u00b0F) per decade over the past 39 years.", "Although many different approaches have been proposed to address this problem, it\u2019s clear that any sustainable, long-term solution will include one important component: a transition to energy sources that don\u2019t result in additional carbon dioxide emissions. While most of the ideas put forth \u2014 such as the hypothetical Green New Deal \u2014 focus on renewable energy sources like solar and wind power, there\u2019s another option that we should seriously reconsider: nuclear fission power.", "The first nuclear reactors to be used for large-scale power generation came online in the mid-1950s, and in that time, there have been a total of over 17,000 reactor-years (where one nuclear reactor operating for a year equals one reactor-year) spanning 33 countries. The three aforementioned incidents are the only adverse ones to be documented in all that time. And yet, when people think of nuclear power, they commonly think of these disasters \u2014 as well as the danger of nuclear war, the hazards of radioactive waste, and the destructive power of the atomic bomb \u2014 rather than the safe, efficient, and green energy source that nuclear power actually is.", "Thankfully, the science behind nuclear power is actually simple, and helps us understand why we shouldn\u2019t fear it the same way we fear nuclear bombs or nuclear war. Instead, there\u2019s a well-understood process that goes on inside the atom, and can generate enormous quantities of power, enough to power our global energy needs for centuries, without the polluting side-effects of fossil fuels.", "Although other fuels can be used, the good news about nuclear power is that it\u2019s self-sustaining: each U-235 nucleus that absorbs a neutron in turn emits three new neutrons when it splits apart, releasing energy and sustaining the reaction. So long as enough neutrons continue to interact with fissile material, the reaction will occur. This releases heat, which is used to boil water, generating steam, and turning a turbine, the same as a chemical-based reactor. Only, with nuclear, there\u2019s no carbon dioxide waste produced.", "Remember what causes a nuclear reaction: the availability of neutrons for the fissile material to absorb. If you put more (or fewer) control rods in, you absorb more (or fewer) of the available neutrons, changing how much interacts with the fissile material. If you increase the temperature, you increase the rate of the reaction; if you decrease it, the reaction rate drops. And the presence of a medium, such as water, can also act as a neutron absorber, but that comes at a cost: you wind up with tritiated water, which itself is radioactive for a period of a few decades.", "Still, this is an enormous win: we can generate more or less power as needed, up to the plant\u2019s maximum safe capacity.", "", "", "Although we still have to overcome the \u201cnot in my backyard\u201d (NIMBY) mentality when it comes to nuclear, this is essentially a scientifically solved problem.", "", "", "The uncomfortable truth is this: we are a space-age civilization that has chosen to eschew technological advances in energy generation because of fear and inertia. We are powering the 21st century with 18th century technology, which has had disastrous effects on our environment that we have ignored for far too long. While there are many possible ways forward to address this problem, nuclear power has the proven track record of success necessary and the flexibility to be an integral, and potentially the primary, resource in humanity\u2019s arsenal in the fight against climate change.", "For many years, we have let fear, rather than facts, control the narrative over nuclear power. While the conventional story around nuclear power focuses on the few disasters that have occurred, nuclear\u2019s track record tells a different story: one of unparalleled safety, successful waste management, and abundant, affordable, green energy. The world needs nuclear power now more than ever. If we can overcome our entrenched biases against it, we just might solve one of the biggest problems facing our world for generations to come."], "citation_urls": null, "html": null}}

Results | Summary - November 17th, 2020

The decimal place value error found in Sprint 2 was fixed, so TC 1.4 passed successfully. For this spring, out of 33 tested websites only 1 failed to load due to a request timeout error found in the following URL: https://www.miamiherald.com/news/coronavirus/article246704006.html. Our implementation, so far, is not able to scrape this website's article in less than 30 seconds which results in the timeout error. This could be because of our website is unable to access the website or because of incompatible web technology. To solve the issue, we could move our web scraping process into a background job which can run asynchronously from the web request. That being said, we did retrieve and successfully scrape 97% of the requested websites, which we consider a successful execution of our project.

Post Sprint Inter-team Integration

Results | Test Cases

Test Case	Description	Last Executed	Type	Execution Status
2.4	API communication with News Authenticity Detection Services	November 23	Communication	Failed

In an attempt to integrate our Web Service with Authenticity Detection Service (Neural Network – Roya's team) we collaborated with the developer. We were provided with the URL to connect our service with theirs. After scraping a news articles and creating a JSON object, we attempted to make a POST request with the respective team's Authenticity Detection Service, but we were provided with a 500 Error Code response. We reached to the team indicating that we received an error and requested them to make the necessary corrections.

Test Case	Description	Last Executed	Type	Execution Status
2.4	API communication with News Authenticity Detection Services	November 24	Communication	Passed

Another team working on an Authenticity Detection Service (Neural Network) reached out to us with their corresponding link to their service. The developer indicated that they had tested the integration of our service with their Authenticity Detection Service and it is connecting successfully. This demonstrates progress for integration between different teams to achieve the objective of the class project requirements. However, we tested on our end using their respective service but did not get it to work.

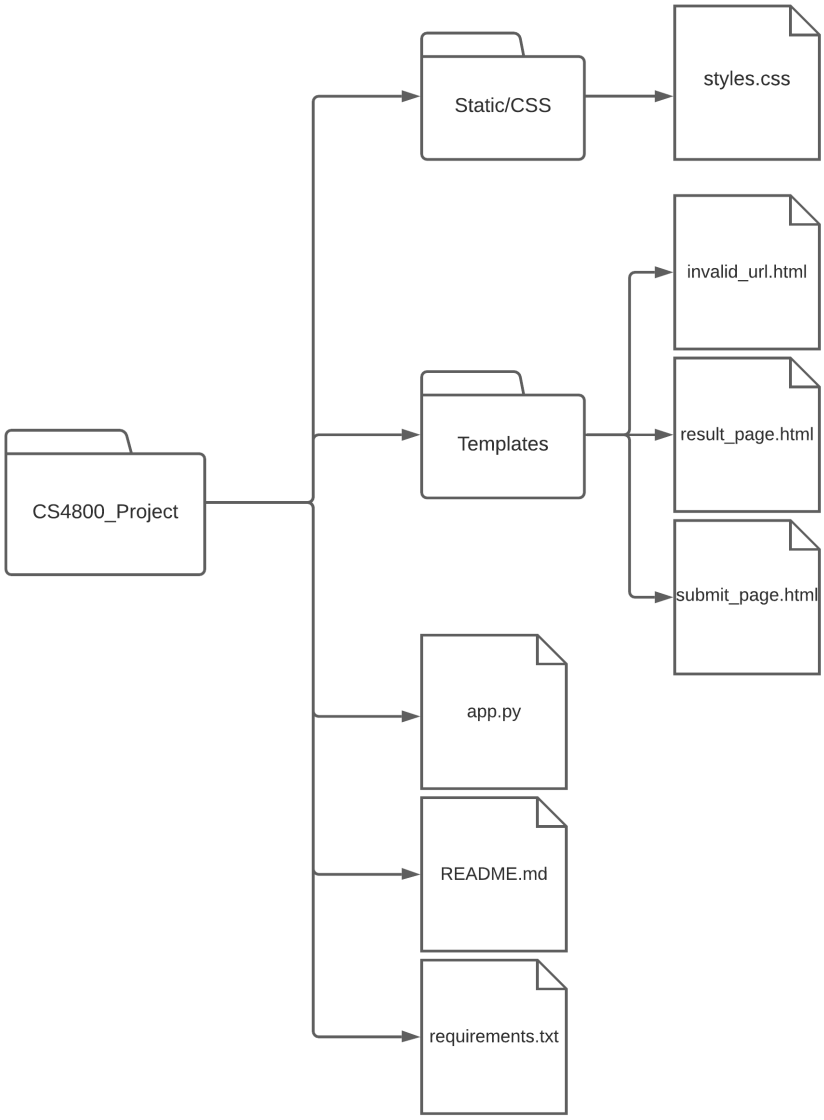
In order to ensure our product is in working state, we created the authenticity detection service interface to verify that the communication performs according to our specifications. We successfully tested and it works.

Test Case	Description	Last Executed	Type	Execution Status
2.1	Ensure specified URL response code is 200 when accessing URL to extract information	November 30	Communication	Passed

As of today, November 30, 2020, we have not been able to integrate with any of the Native App teams because none of the teams have demonstrated a successful, working Native App application to us. Therefore, we have internally tested using Postman to ensure we are capable of successful communication with any Native App teams.

Project Source Code

Project File Structure



The file structure of this project is fairly simple. The server code is in app.py, with the requirements detailed in requirements.txt. The README.md file contains the API documentation and is also hosted by the server at the Developer Guide section of the webapp. The Templates folder contains all of the HTML files related to the project, and the Static/CSS folder contains the styles.css style sheet for the project's HTML files.

Source code available at: https://github.com/patelmeetkumar/CS4800_Project

Project Build & Deployment Instructions

The following are the instructions for deploying the team's app on Heroku:

Pre-requisites:

- Install IDE for python development
- Install Git
- Install pip
- Install Python 3.X
- Install Heroku CLI (https://devcenter.heroku.com/articles/heroku-cli)

Instructions:

1. Clone repo from https://github.com/patelmeetkumar/CS4800_Project.git
2. Open the project in IDE
3. If not already present in code:
    - Install Flask and Gunicorn: pip install Flask, gunicorn
    - Create requirements.txt: pip freeze > requirements.txt
    - Create Procfile file: web: gunicorn app:app
4. Connect heroku in terminal by typing: heroku
5. Login to heroku account using CLI: heroku login
6. Create a web app on heroku: heroku create < your_app_name >
7. Initialize a git repo: git init
8. Add all the files in the repo and commit all the changes
9. Push the app to heroku: git push heroku master
10. Open the app: heroku open

Congratulations! You have successfully built and deployed the application.

Project Release Notes

- All pertinent information available at: https://naws.herokuapp.com/dev