Flask - Server

General Information & Licensing

Code Repository	https://github.com/pallets/flask
License Type	BSD
License Description	• Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. • Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. • The names of the contributors may not be used to endorse or promote products derived from this software without specific prior written permission.
License Restrictions	• Liability
Who worked with this?	Everyone in the group

Use as many of the sections below as needed, or create more, to explain every function, method, class, or object type you used from this library/framework.

Flask Object

Purpose

- What does this tech do for you in your project?
    - This tech helps us to have a central location where everything goes through. It acts like the server that controls what happens when a request is sent in.
    - We used flask to: set up endpoints to handle GET and POST requests, monitor cookies, handle backend data, serve templates, handle media uploads, and data between users.
    - This library was the backbone of our project.

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - This tech is used in app.py. We use this to help us set up the server so that we can route requests to the correct functions.
    - We use Flask functions and variables throughout our app.py file. It is used to handle endpoints for every page and functionality within our web app.

Magic

Dispel the magic of this technology. Replace this text with some that answers the following questions for the above tech:

- How does this technology do what it does for you in the **Purpose** section of this report? Please explain this in detail, starting from after the TCP socket is created. Remember, to be allowed to use a technology in your project, you must be able to know how it works.
    - The Flask framework helps to create the backend calls to the server.
        - Backend calls are calls that are made to the api and calling pre-defined functions from the api
    - It is a central registry for url rules, to view functions
    - The parameter that it takes in allows Flask to get an idea of what belongs to the application. The parameter that it takes in is the name of the package that you are using.

- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - line 21
    - https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L21
    - It is also used throughout the entirety of the code in app,py

Route method

Purpose

Replace this text with some that answers the following questions for the above tech:

- What does this tech do for you in your project?
    - This method helps us to route the different paths to the correct actions that need to be completed based on user activity.
    - For every page and action on our website, we handle the website path with the @app.route decorator. I.e. if a user uploads an image, we designate the function under the @app.route("/image-upload") decorator to handle uploading the image.

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - This method is used in app.py. We use it to route the paths that we receive to the correct next steps.
    - It is used throughout the entirety of the app.py file
    - We are using the route method for every path that we define so that the application can properly perform actions.
    - For each of the method calls we identify the rule that it needs to follow. If the rule matches then it performs the corresponding actions.
    - For some of the calls, we specify that we are expecting a GET and POST request as parameters.

Magic

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- How does this technology do what it does for you in the **Purpose** section of this report? Please explain this in detail, starting from after the TCP socket is created. Remember, to be allowed to use a technology in your project, you must be able to know how it works.
    - The route method helps us to define the acceptable paths and the corresponding actions. If we receive a request from the client, the server should know what to do next. If a path that was given is not defined in the server, it doesn't do anything. If a path is defined, it will send a response back.
    - The route method takes in the path as its variables and then sees if the path exists.
    - Route calls an add_url_rule so that the server knows how to handle the path.
    - When we start the server, we load up the webpage.

- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - In our codebase it is being used in app.py
      https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L76-L164
      Check lines 76-164 for all instances of the method

render_template method

Purpose

Replace this text with some that answers the following questions for the above tech:

- What does this tech do for you in your project?
    - This method helps us to display an html template for the server with given content.
    - It takes in the html template file and the variables to be passed into the template file for parameters.

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - We are using this method in app.py at line 100
    - https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L100

Magic

Dispel the magic of this technology. Replace this text with some that answers the following questions for the above tech:

- How does this technology do what it does for you in the **Purpose** section of this report? Please explain this in detail, starting from after the TCP socket is created. Remember, to be allowed to use a technology in your project, you must be able to know how it works.
    - After the server is created, anytime that we go to the root path, we use it to load the homepage template. We load the template with the list of all active users that are connected. It also displays any images that were uploaded to the server by any user.
    - Flask breaks down the request for us and checks the keyword for where to go in the codebase.
    - The response is being made in the function that is below each of the app.route lines of code.
    - The response is being sent out when we return the response based on the logic that we did during each action.
    - The server gets started using the Dockerfile.

- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - In our codebase it is being used in app.py on line 100
    - https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L100

current_app.send_static_file method

Purpose

- This technology allows us to access data regarding the currently running application. Notably, information about the configuration is granted.
- This method allows us to host a login, register, and status page
    - We do this by calling the embedded function “send_static_file”.
- This method occurs in the app.py file. It is called 3 times.
- This method is used in app.py.
- It is called 3 times - lines 117, 112, and 85.
- Each call contains a single string parameter. It is a string of the status, register, and login html files.

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Dispel the magic of this technology. Replace this text with some that answers the following questions for the above tech:

- Once the Flask app runs, the current_app.send_static_file() is called once an endpoint is triggered at either “/status”, “/login”, or “/register”.
- The users information is updated and stored in a database. The current_app.send_static_file() is then called/returned.
- The current_app.send_static_file() method provides the functionality to change pages when the user clicks on a different button.
    - Specifically, the login, register, and status pages.
- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - In our codebase it is being used in app.py on lines 104, 138, and 142
    - https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L104
    - https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L138
    - https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L142

request method

Purpose

Replace this text with some that answers the following questions for the above tech:

- What does this tech do for you in your project?
    - This method helps us to access the incoming request data from the user.
    - We can have access to things like headers, body, forms, and cookies of incoming requests. Flask conveniently organizes this information into accessible variables within the request module
    - It also allows us to systematically organize outgoing responses - we can set things like cookies, body's, headers, forms, etc…

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - This method is used in app.py.
    - We use the method to get any incoming data from the request. We use it to grab different inputs that we get from the user.
    - It is utilized throughout our app.py file, depending on the kind of request being handled.

Magic

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    - The route method helps us to define the acceptable paths and the corresponding actions. If we receive a request from the client, the server should know what to do next. If a path that was given is not defined in the server, it doesn't do anything. If a path is defined, it will send a response back.
    - The route method takes in the path as its variables and then sees if the path exists.
    - Route calls an add_url_rule so that the server knows how to handle the path.
    - When we start the server, we load up the webpage.

- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
- https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L33-L165

redirect method

Purpose

Replace this text with some that answers the following questions for the above tech:

- What does this tech do for you in your project?
    - The redirect module acts as a tool to redirect the user to a different page on the website.
    - This allows the code to change the page's url after the user completes an action.

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - This method is used in app.py.
    - We use it in line 164

Magic

Dispel the magic of this technology. Replace this text with some that answers the following questions for the above tech:

- How does this technology do what it does for you in the **Purpose** section of this report? Please explain this in detail, starting from after the TCP socket is created. Remember, to be allowed to use a technology in your project, you must be able to know how it works.
    - After starting the server using the Dockerfile, we use this function every time that we upload any image.
    - Every time that we upload an image, we use it to redirect the user to the home page.
    - Once at the homepage, the image is written to the index.html template and it is then rendered.
    - Every time a redirect is called, a 300 level response is sent.

- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - In our codebase it is being used in app.py
      https://github.com/ethannhan/codebusters/blob/main/flaskProject/app.py
      Look at line 164

      https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L164

make_response method

Purpose

Replace this text with some that answers the following questions for the above tech:

- What does this tech do for you in your project?
    - This method helps us to make the response that we send back to the client

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - This method is used in app.py.
    - We use it in line 104 & 142

Magic

Dispel the magic of this technology. Replace this text with some that answers the following questions for the above tech:

- How does this technology do what it does for you in the **Purpose** section of this report? Please explain this in detail, starting from after the TCP socket is created. Remember, to be allowed to use a technology in your project, you must be able to know how it works.
    - After starting the server using the Dockerfile, we use this function every time that we upload any image.
    - Every time that we upload an image, we use it to redirect the user to the home page.

- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - In our codebase it is being used in app.py
      https://github.com/ethannhan/codebusters/blob/main/flaskProject/app.py

      https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L104

      https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L142

werkzeug.utils.secure_filename() method

Purpose

Replace this text with some that answers the following questions for the above tech:

- What does this tech do for you in your project?
    - This method safely handles security vulnerabilities regarding file uploads.
    - It prevents users from accessing files on the hosts machine or server.
    - It also prevents the file from being named a special file on windows devices
    - We use this method to compute a sanitized filename from the initial input and then we store this on the server's local filesystem.
        - The image is also added to the html template and the subsequent home page of the website.
        - The image displays after a refresh.

- Where specifically is this tech used in your project? Give us some details like file location and line number, if applicable. If too cumbersome, a general description of where it's used for a given purpose is fine as well.
    - This method is used on the /image-upload endpoint function.
    - It is on line 161.

Magic

Dispel the magic of this technology. Replace this text with some that answers the following questions for the above tech:

- How does this technology do what it does for you in the **Purpose** section of this report? Please explain this in detail, starting from after the TCP socket is created. Remember, to be allowed to use a technology in your project, you must be able to know how it works.
    - After starting the server using the Dockerfile, we use this function every time that we upload any image.
    - After beginning the server using the Dockerfile, this method is called whenever the client needs to upload an image.
    - The user's request is parsed using Flask's request.files variable, and the resulting filename string is made secure (how this happens is stated in the purpose section).
    - The resulting sanitized filename is return as a string.
- Where is the specific code that does what you use the tech for? You ***must*** provide a link to the specific file in the repository for your tech with a line number or number range.
    - In our codebase it is being used in app.py
      https://github.com/ethannhan/codebusters/blob/main/flaskProject/app.py
      Look at line 139

      https://github.com/ethannhan/codebusters/blob/4496b9c1cb7b67a4cebb92dde811bc511e2b5694/flaskProject/app.py#L161