CISC 4615 — Lab 3

In this lab, you are going to implement a simple HTTP server.

Browsing a webpage locally

To browse a local webpage in the format of HTML file, you just need to double click the html file and the browser will process the code in the file and load the corresponding objects.

In the following sample html file, it contains 5 objects, 4 of them are stored locally and the other one is a javascript file from Google APIs (for the location).

```html
<html>
    <head>
        <meta charset="utf-8">
        <meta name="viewport" content="width=device-width, initial-scale=1">
        <link rel="stylesheet" href="style.css" />
        <title> CISC 4615 Lab 3</title>
        <script src="https://ajax.googleapis.com/ajax/libs/jquery/1.10.2/jquery.min.js"></script>
    </head>

    <body>
        <p> </p>
        <p> </p>
        <h1>I Love Fordham University</h1>
        <img src="fordham_logo.png" alt="Fordham Logo">
        <p> </p>
        <p> </p>
        <video width="480" height="270" controls>
            <source src="FordhamUniversity.mp4" type="video/mp4">
        </video>

        <h1><div id="temp"></div><div id="minutely"></div></h1>
        <h2><div id="location"></div></h2>
    </body>
    <script src="app.js"></script>
</html>
```
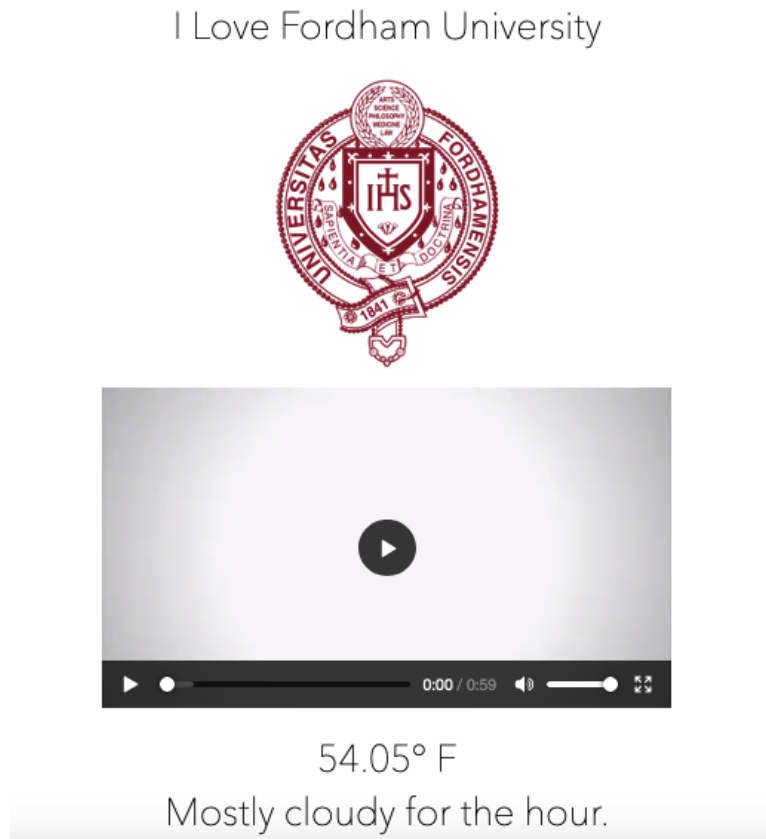
objects / source files

After the processing by the browsers, we will see the following webpage.

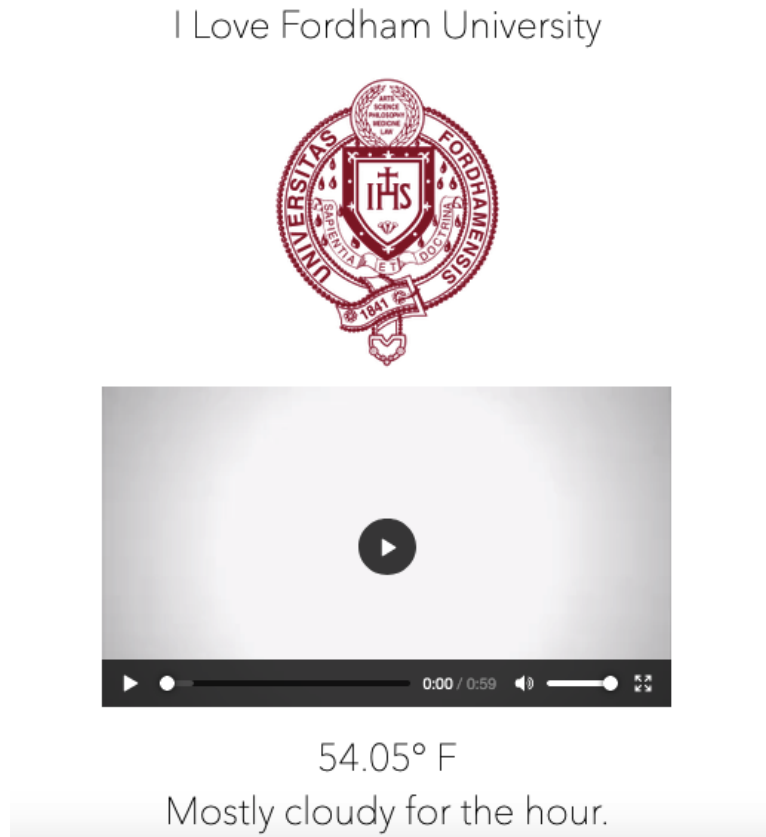I Love Fordham University

54.05° F
Mostly cloudy for the hour.

On the address bar, we can clearly see that the webpage is stored locally.

/Users/yingmao/Desktop/Fordham-Teaching/Spring2019/CISC4615/Lab3/index.html

Browsing a webpage through the network

In this course, we learned that browser was designed to process the data from the network. It works at the application level with HTTP protocol for transmission between server and client (browser).

From a simple server (local socket), you will see the same webpage.

However, this webpage is transferred from the network.

Study the sample codes

Please study the sample code to understand the code style and logic of the samples.

`https://github.com/yingmao/CISC4615-Lab3-Base`

1. FordhamUniversity.mp4: the vedio file.

2. app.js: the javascript file for .

3. fordham_logo.png: the picture file.

4. index.html: the main HTML file.

5. style.css: the css file for style control.

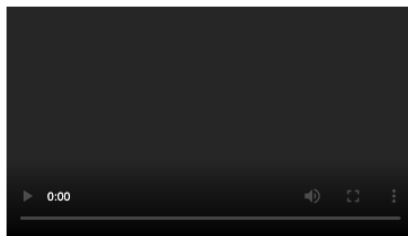6. SimpleHttpServer-Base.c: the base code for your server.

You can compile your code with the following command,

- gcc SimpleHttpServer-Base.c -o server

Then, you can run the code normally, ./server

After the server is running, you should open your browser and type http://127.0.0.1:9001 to check the webpage, which presented the following figure.

As you can see from the figure that the objects are not in the center and the video can not be played. With the given base code, the server can pass (1) index.html (line 104 - 119) (2) app.js (line 142 - 149) (3) fordham_logo.png (line 124 - 141).

You should read the corresponding lines and write the code to pass (1) style.css and (2) FordhamUniversity.mp4.

For example, the following figure shows how to pass fordham_logo.png to the browser. If you want to write code for passing style.css file, you should copy/paste the lines and change line 124, 126, 131 and 136. Please note that the last number of strncmp function means the number of characters that you want to compare (you have to change this number to yours).

```
124            else if(strncmp(recv_buf, "GET /fordham_logo.png", 20) == 0)
125            {
126                printf("********Send png********\n");
127                sprintf(buf, "HTTP/1.0 200 OK\r\n");
128                send(client_fd, buf, strlen(buf), 0);
129                strcpy(buf, SERVER_STRING);
130                send(client_fd, buf, strlen(buf), 0);
131                sprintf(buf,"Content-Type: image/png\r\n");
132                send(client_fd, buf, strlen(buf), 0);
133                strcpy(buf, "\r\n");
134                send(client_fd, buf, strlen(buf), 0);
135
136                int len2 = read_file_to_buffer("fordham_logo.png",buf);
137                if(send(client_fd, buf, len2, 0)!= -1)
138                {
139                    printf("Successfully sent png.\n");
140                }
141            }
```

Lab 3 Assignment

For c/c++ users, you should write the code to pass (1) style.css and (2) FordhamUniversity.mp4 to the browser. Please note that the content type of mp4 file is "Content-Type: video/mp4" and the content type for css file is "Content-Type: text/css".

For python users, there is a python built-in http server you can use. You don't have to write any code, but just figure out how to run python with its built-in server and present the correct webpage. To be fair with everyone, I do not provide any base code for python users.

On May 2nd, I will give you more clues if necessary. Please reach out to me anytime if you need help on coding.

Grading Rubric

(40%) CSS file;
(40%) MP4 file;
(15%) Report;
(5%) Submission format;

Submission

You can earn 5% bonus, if you can submit the lab 3 before 6:00 pm (before class) on Thursday May 2nd.

You should email be a zip file that contains your code (c/c++ user) and your detailed report with screenshots. The deadline is May 6th, by the end of the day.