

Before you turn this problem in, make sure everything runs as expected. First, **restart the kernel** (in the menubar, select Kernel → Restart) and then **run all cells** (in the menubar, select Cell → Run All).

Late submission leads a zero.

Make sure you fill in any place that says `YOUR CODE HERE` or "YOUR ANSWER HERE", as well as your student ID (starting with 1), name, and section number below:

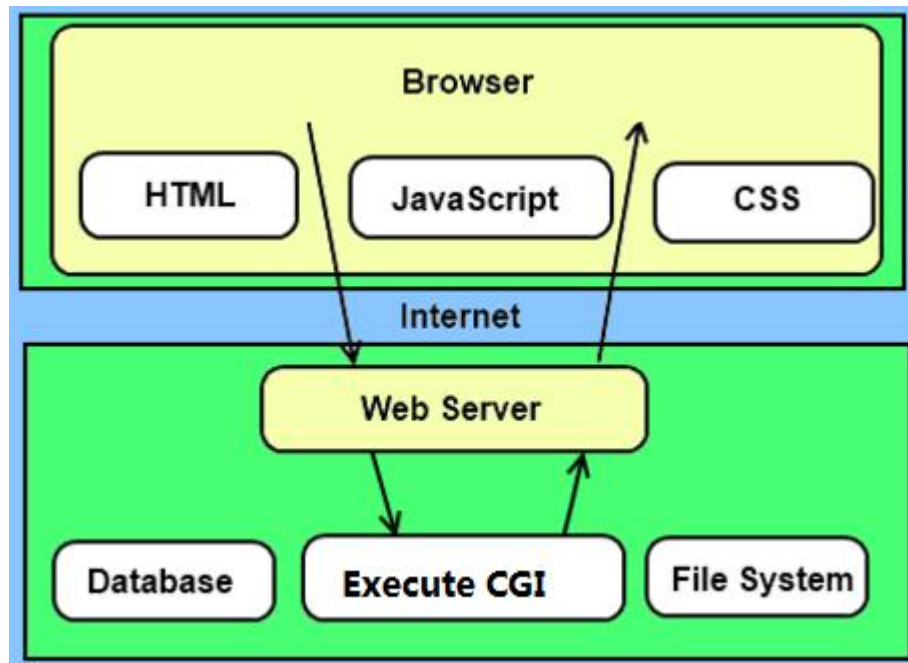
```
STUDENT_ID = ""
CHINESE_NAME = ""
SECTION_NUMBER = ""
```

CGI Programming

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What is CGI

- The Common Gateway Interface, or CGI, is a standard for external gateway programs to interface with information servers such as HTTP servers.
- When we enter a URL to request a page from the web Server, it finds that file then sends it back to the browser.
- In CGI programming, instead of sending a file back, it is executed as a program, and the program outputs is sent back to your browser.
- The programs are called CGI scripts. These CGI programs can be a Python Script, PERL Script, Shell Script, C or C ++ program, etc.



First CGI program

In order to make sure our web server is running correctly, let's configure CGI scripts in two steps.

- Find the **httpd.conf** file under C:\xampp\apache\conf, search for line **<Directory "C:/xampp/cgi-bin/" >**, and then use the following code to replace that between **<Directory "C:/xampp/cgi-bin/" >** and **</Directory>**.
- Find the **httpd.conf** file under C:\xampp\apache\conf, search for line **AddHandler cgi-script**, and add **.py** to the end.

```
# The first step
<Directory "C:/xampp/cgi-bin/" >
    AllowOverride All
    Options All
    Order allow.deny
    Allow from all
</Directory >
# The second step
AddHandler cgi-script .py
```

Run the first CGI script

Maintain the hello.py file under the XAMPP\cgi-bin as follows. Change the first line to the path of your **python.exe**. Remember that:

- you should run the following code on your local machine instead of jupyter note directly
- the first comment of the code following is **essential**, and it includes an address which points to the directory of the file, 'python.exe', in your computer.

```
#!C:\Users\UIC\AppData\Local\Programs\Python\Python37-32\python.exe
# you should replace the first comment according where 'python.exe' is in your own
computer.
print("Content-type: text/html\r\n\r\n")
print("<html>")
print("<head>")
print("<title>Hello World - First CGI Program</title>")
print("</head>")
print("<body>")
print("<h2>Hello world! This is my first CGI program!</h2>")
print("</body>")
print("</html>")
```

In a browser, view the following page: <http://localhost/cgi-bin/hello.py>

GET and POST Methods

When we send a request to the web server, sometimes we want to send some data over. Browser use two methods to pass data to web server: GET and POST.

GET method

<http://localhost/cgi-bin/hello.py?key1=value1&key2=value2&key3=value3>

- Data in the GET method appears in your URL
- Never use GET method to pass sensitive information.
- Size limitation: only 1024 characters can be sent in a request string.

Bellow is **get.py** script. Put the file under xampp\cgi-bin folder. Then enter the following URL in a browser as follows. Observe how data is sent using get method.

<http://localhost/cgi-bin/get.py?firstName=Mary&lastName=Smith>

```
#!C:\Users\UIC\AppData\Local\Programs\Python\python37-32\python.exe
# Import modules for CGI handling
import cgi
import cgiib

# Create instance of FieldStorage
form = cgi.FieldStorage()

# Get data from fields
firstName = form.getvalue('firstName')
lastName = form.getvalue('lastName')

print("Content-type:text/html\r\n\r\n")
print("<html>")
print("<head>")
print("<title>Get Name</title>")
print("</head>")
print("<body>")
```

```
print("<h2>Hello %s %s</h2>" % (firstName, lastName))
print("</body>")
print("</html>")
```

Here is an example to show you how to send and retrieve data in a post method.

C:\xampp\htdocs\majorSelectionForm.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Major Selection</title>
</head>
<body>
    <h1>Major Selection</h1>
    <form action="../cgi-bin/displayInfo.py" method="post">
        <table>
            <tr>
                <td>
                    Student ID: <input type="text" name="ID"/><br/>
                    Student Name: <input type="text" name="name"/>
                </td>
            </tr>
            <tr>
                <td>
                    Major:
                    <select name="major">
                        <option value="CST" selected>CST</option>
                        <option value="DS">DS</option>
                    </select>
                </td>
            </tr>
            <tr>
                <td>
                    <input type="radio" name="bestlang" value="C++" />C++
                    <input type="radio" name="bestlang" value="Java" />Java
                    <input type="radio" name="bestlang" value="Python" />Python
                </td>
            </tr>
            <tr>
                <td>
                    <input type="submit" value="submit">
                </td>
            </tr>
        </table>
    </form>
</body>
</html>
```

C:\xampp\cgi-bin\displayInfo.py

```
#!C:\Users\UIC\AppData\Local\Programs\Python\Python37-32\python.exe
import cgi
import cgiib

form = cgi.FieldStorage()

# Fetch data edit boxes
studentID = form.getvalue('ID')
studentName = form.getvalue('name')

# drop down box
if form.getvalue('major'):
    major = form.getvalue('major')
else:
    major = "No Selection"

# checkbox
if form.getvalue('C++'):
    CPlusFlag = "C++"
else:
    CPlusFlag = ""

if form.getvalue('Java'):
    JavaFlag = "Java"
else:
    JavaFlag = ""

if form.getvalue('Python'):
    PythonFlag = "Python"
else:
    PythonFlag = ""

# radio button
if form.getvalue('bestlang'): # radio
    bestlang = form.getvalue('bestlang')
else:
    bestlang = ""

if form.getvalue('textcontent'):
    textContent = form.getvalue('textcontent')
else:
    textContent = ""

print("Content-type:text/html")
print()
print("<html>")
print("<head>")
print("<meta charset=\"utf-8\">")
print("<title>Major Selection</title>")
print("</head>")
```

```

print("<body>")
print("<h2>%s %s</h2>" % (studentID, studentName))
print("<h2> You have picked: %s</h2>" % major)
print("<h2>You have learned: %s %s %s</h2>" %
      (CPlusFlag, JavaFlag, PythonFlag))
print("<h2>You like %s the best.</h2>" % bestlang)
print("<h2>%s</h2>" % textContent)
print("</body>")
print("</html>")

```

To view your page, enter address:

<http://localhost/majorSelectionForm.html>

Task

Suppose your company is hiring new people. Candidates will fill the following form to submit. Use CGI Python programming to show what the user entered. Zip and submit your file on iSpace.

Please fill in the form below to submit

User Name :

Position :

Officer
Officer
Manager
Engineer
Atchitect

Your current skills

☐ Web Design
☐ Java
☐ Database

Cities Expected

☐ Beijing
☐ Shenzhen
☐ Zhuhai

Recent Jobs

Assitant
Software Engineer
Customer Service
Manager
CEO

Working Experience:

Upload a File
Browse...

Submit
Reset