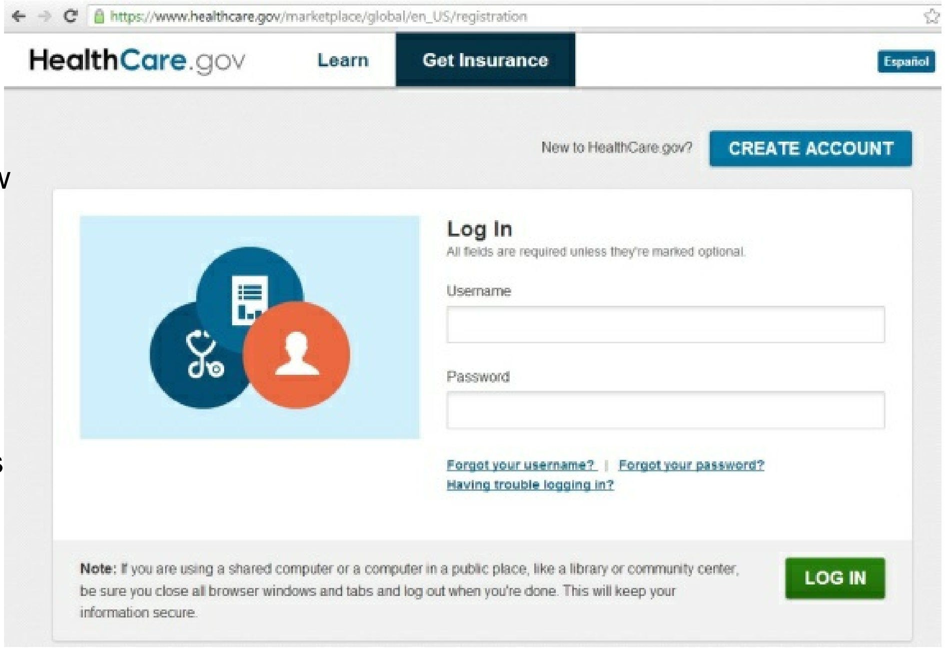
PLTW COMPUTER SCIENCE

Activity 2.2.2

Introducing PHP

Introduction



All fields are required unless they're marked optional.

Note: If you are using a shared computer or a computer in a public place, like a library or community center, be sure you close all browser windows and tabs and log out when you're done. This will keep your information secure.

Where does data in a web form go when you click Submit? How does a website remember that you are logged in so that you don't have to log in again every time you load another page? How do businesses maintain records of what customers have purchased through their websites?

Looking at a form created in HTML leaves a lot of questions unanswered about what happens when the form is submitted. One of the most common answers to this question is that the server processes the data from the form using PHP and MySQL®, the dynamic duo. The values entered in the form's fields are passed as variables to a PHP program on the server. The PHP program can write data to or retrieve data from a MySQL database. The PHP program uses the data to create HTML/CSS/JavaScript to send back to the client.

Materials

- Computer with browser
- Cloud9 accounts and workspace
- Firefox with the Firebug add-on

Resources

2.2.2 sourceFiles.zip

Procedure

Part I: Outline of a PHP page

1. Form pairs as directed by your teacher.
2. Meet or greet your partner and establish team norms.

3. Recall that JavaScript is client-side scripting language. PHP is the most common **server-side scripting language**. This means that the code is executed by the server rather than the client. This allows a web designer to deliver interactive pages without the client being able to see the code and without the client needing to load all the data. The acronym originally stood for Personal Home Page, but has since been changed into a recursive (self-referencing) acronym: PHP stands for *PHP: Hypertext Preprocessor*.

   Why might this ability to hide code from the client be preferable sometimes?

4. To understand some of the advantages of using a server-side language like PHP, we will continue to examine a model student art gallery. The Cloud9 workspace folder 222 should contain `222indexA.php`, `222account_creationA.php`, `222artist_portalA.php`, `222logoutA.php`, and `thumbs.py`.

5. Visit the page `222indexA.php` in your browser at `https://workspace-c9username.c9users.io/222/222indexA.php` using your workspace and username.

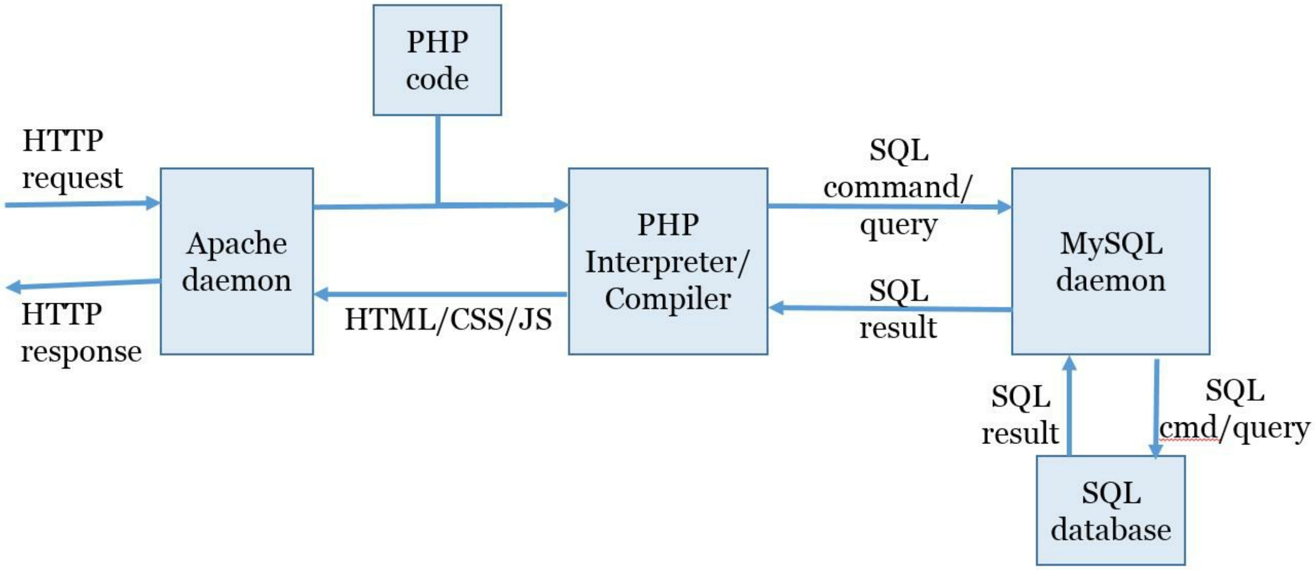
   You should see a web form with two links and two fields that you can fill in.

6. Enter the first name “Aprill” and the last name “Aronie” and click the SEARCH button. Describe what happens.
7. Now enter just the first name ”Aprill”, leaving the last name blank. Describe how the behavior of the page changes, if at all.
8. Enter just the last name “Aronie”, leaving the first name blank. Describe how the behavior of the page changes, if at all.
9. Now enter your own first and last name. How does the behavior of the page differ from Steps 6–8, if at all?
10. Describe how this page behaves differently than the `221indexA.html` provided in the previous activity, if at all.

    PHP makes the index page for our website load differently depending on user input. The program `222indexA.php` constructs a table of images similar to `221indexA.html`. However, it creates the HMTL based upon the user's query by accessing a MySQL database. Note that PHP actually generates the HTML for the page every time the page is loaded. Viewing the source for the page in your browser will show only the HTML that was generated, not the underlying PHP.

11. In the Cloud9 workspace, use Ctrl-f within `222indexA.php` to search for instances of the variable names `firstname` and `lastname` as well as other key words where appropriate, and read through the comments in `222indexA.php`.
12. Write down the line number(s) where the code performs each of the following tasks:
    - HTML code creates the form that we see on the page.
    - A `<TABLE>` tag opens in HTML.
    - PHP code makes sure that the table never gets wider than 6 cells.
    - HTML code inserts an image into a cell in the table.

Our web page responds to data sent by the user to the server by running a PHP program. Apache™ passes the user's data to the PHP engine. The PHP engine is an interpreter/compiler program, and the PHP engine is executing the PHP program using variable values from the search terms provided by the user. PHP passes the requests called **queries** to the MySQL server program. A server programs like MySQl and Apache is also called a **daemon** (pronounced day-mun). The MySQL daemon returns the results of the query back to the PHP program, which creates HTML based on the response from MySQL. Apache then sends the response to the client.



A MySQL query is submitted using the PHP command `mysql_query($query)`.

In which line numbers is PHP querying MySQL? You may want to use the find function of your text editor as you did in the previous step.

Part II: PHP Basics

13. HTML is a client-side language. HTML code is sent to the client machine and is then rendered by the client machine's web browser.

    What does PHP use HTML code for?

14. PHP is a server-side scripting language, meaning that it runs on the server instead of on the client's machine.

    What can be done with PHP that cannot be done with HTML alone?

15. The syntax of a language includes the rules about what characters can be used in variable names, how keywords can be put together, and how commands are separated and grouped.

16. Examine `222indexA.php`, `222account_creationA.php`, and `222artist_portalA.php` with your partner. Answer 5 to 10 of the following questions, as directed by your teacher.

- How, if at all, does the syntax for a multi-line comment in PHP vary from the syntax in *Python*?
- What character appears at the end of a statement in PHP?
- What are curly braces `{` and `}`used for in PHP?
- What symbol do all variables begin with in PHP?
- In *Python* we used `+` to indicate string concatenation. What is used to concatenate strings in PHP?
- How, if at all, does the syntax for a function call in PHP differ from the syntax for a function call in *Python*?
- What does the keyword `echo` do in PHP? If you do not know, use the Internet to help you find an answer.
- In *Python* the assignment operator is `=`, while the condition equality operator is `==`. How are assignment and conditional equality expressed in PHP?
- In *Python* elements of a list can be accessed with `*variable*[*index*]`. The language PHP uses arrays instead of lists. In an array all elements must be of the same data type. Languages index lists and arrays similarly. How, if at all, does the syntax for indexing an array differ in PHP from the way that lists are indexed in *Python*?
- How, if at all, does the syntax for defining a function in PHP differ from the syntax in *Python*?

17. Explain the purpose of the function `display_table` in `222indexA.php`.
18. What do you think is the purpose of the function `popen`, called on line 149 of `222artist_portalA.php`, in the uploading of images?

19. Examine the official documentation for the PHP function `mkdir` found at **http://www.php.net/mkdir**. What do the different parameters of `mkdir` represent?

    - `pathname`
    - `mode`
    - `recursive`

20. Use Firebug to examine the cookies this website uses when you access the different PHP files.

    Which pages produce cookies and what values do those cookies store?

Part III: Modifying PHP and JavaScript

In this part of the activity, you'll look at some JavaScript™ code that interacts with PHP to dynamically create a popout containing information about the artist and the image that a user mouses over. An alternative design decision would be to skip the use of JavaScript and popouts and instead provide the same information using only PHP. This can be done if the index page code is dynamically changed. Instead of thumbnails, the image will be available in its full form, along with details about the art and artist.

21. Discuss with your partner the merits of each approach and then describe which design you like the best and why.

22. Locate the following files in the 222 folder in your Cloud9 workspace.
    - `222popouts.js`
    - `222artist_portalB.php`
    - `222indexB.php`
    - `222logoutB.php`
    - `222account_creationB.php`
    - `thumbs.py`
23. Open `222indexB.php`. Explain in your own words what each of the following sections of code does.
    - Line 20:
    - Lines 21–33:

    Lines 111–112 of `222indexB.php` call the JavaScript function that creates popout functionality. The code for this function is not yet correct. The code can be found in `222popouts.js`.
24. Use these lines of code as well as the JavaScript file to help you determine the purpose of each of the arguments in the call to `showDetailedView`.
    - `$div_id:`
    - `$firstName:`
    - `$dbname:`
25. View `222indexB.php` in a browser. Do a search for first name "aprill" and mouse over the images that are rendered. What problems do you notice with this implementation of popouts, and how would you want it to behave differently?
26. Two problems you could have noted in step 25 are that except for the first image, the popout images do not match the thumbnails and that the artist's last name is not shown in the popout.

    Modify the existing code to fix these two problems, using the code that shows the artist's first name in the JavaScript popout as a guide to help. As you work to produce this code, you'll need to follow a different workflow than you have for developing static web pages or other programs. Because all the information in the database is contained on the server, you must upload your modified files to the server and then open them in a web browser that accesses the server to determine whether your program is working correctly.

Conclusion Questions

1. In Activity 2.2.1 you used a version of this site that was constructed entirely from HTML, JavaScript, and CSS. What do you think are the most important improvements made by using PHP and MySQL?
2. What language would you use if you wanted to access information on a server?
3. What language would you use to create a zoom feature for images on your website without putting any additional strain on the server?
4. What language would you use to put a pretty frame around a table on your website?
5. What purpose did the comments in `222indexB.php` serve for you as you worked through this

activity?