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## CSCI 4000 Assignment 4

**Total estimated time** for this assignment: **12 hours** (if you are a good programmer)

The main programming language for this assignment should be **PHP** (mixed with HTML and CSS). If you do not use **PHP**, you will get **0 points**. For this assignment, you must use **PDO** (PHP Data Object) to interface with the MySQL database. If you do not use PDO, you will receive 0 points for almost all questions.

When you see “Richard Ricardo” or “richardricardo” in the examples and screen captures, change it to **<your name>**.

When you see “Richard” or “richard” in the example screen captures, change it to **<your first name>**.

If you do not put **<your name>** / **<your first name>** in the above mentioned fields, you will get **0 points** for the question(s).

**No two students** should submit webpages with exactly the same code, content, layout, or color combination. If found, **both** students will get **0 points**.

Please change the provided example’s layout and color combination (color scheme). **If you use (copy) ANY of the provide example’s color combination, 10 points will be deducted (-10 points).**

Create a folder on your hard disk, name the folder **lastname\_firstname\_assignment4**. Save all the files from this assignment in this folder.

Use XAMPP web server solution stack package to help debugging PHP code. It will make your debugging process easier. All php files must not produce any error, or any warning (**-2 points for each error, each warning**). Your program must run. A program that does not run will get at most **50% of the possible points**. All files must begin with a **comment** that identifies the author, the course code, and the program date (**- 2 points each question** if found missing). All html, css and php files must be clearly **documented (commented)**. Points will be taken off (**-2 points each question**) for insufficient comments (`<!-- -->`, `/* */`, `//`).

- When you view page source in a web browser, `<!DOCTYPE html>` must be at the top of every page. In other words, all pages must be written in HTML5. (**-20 points** if not)
  - You **can** put php code before `<!DOCTYPE html>`.
  - You **cannot** put html code before `<!DOCTYPE html>`.
- Before adding PHP code, all html files must pass html validation at <http://validator.w3.org/> without any **error** (and with only 1 warning).
- After adding PHP code, the generated html code (Firefox web browser > right-click > view page source) must also pass html validation at <http://validator.w3.org/> without any **error** (and with only 1 warning).
- All css files must pass css validation at <http://jigsaw.w3.org/css-validator/> without any **error**. (**-2 points for each error/warning**, only 1 warning is allowed for html validator)

**Question 1 – Database:** PHP Chapter 4, eg009 and knowledge of SQL (20 points) **Estimated time: 3 hours**

- Save question 1 files in folder “**lastname\_firstname\_assignment4**”: (2 points)
  - **create\_db.sql**
- Create a text file **create\_db.sql**, write sql statements in the file to
  - Create a MySQL database **richard\_ricardo\_student\_db**. (2 points)
  - In the database, create 2 tables. (2 points)
    - major
    - student

- Create the following fields (columns) for the tables (refer to examples below for details).
  - major table: majorID, majorName (2 points)
  - student table: studentID, majorID, firstName, lastName, gender (2 points)
- Do foreign key referencing, to maintain referential integrity (3 points)
  - One student can only have one major.
  - One major can be used (enrolled) by many students.
  - majorID is the primary key of the major table.
  - studentID is the primary key of the student table.
  - majorID is a foreign key of the student table, for any values of majorID appearing in the student table, these values must also appear in the major table.
- Insert test records to major table and student table. (3 points)
- Create a MySQL database username **richardricardo1** with password **richardisgreat**, with data privileges (select, insert, update, delete) for the **richard\_ricardo\_student\_db** database. (4 points)
- All above must be done by SQL statements in the text file **create\_db.sql**. (0 points if not)
- Load **create\_db.sql** in XAMPP > phpMyAdmin to create the above mentioned database.
- Note: In the real world, do NOT put sql files in a website folder. Keep it offline and safe.

### Example: “richard ricardo student db” database and the tables

The screenshot shows the phpMyAdmin interface for the database 'richard\_ricardo\_student\_db'. The left sidebar shows the database tree with 'richard\_ricardo\_student\_db' selected, containing tables 'major' and 'student'. The main panel displays the table structure for the selected database:

Table	Action	Rows	Type	Collation	Size	Overhead
major	Browse Structure Search Insert Empty Drop	3	InnoDB	latin1_swedish_ci	16 KiB	-
student	Browse Structure Search Insert Empty Drop	9	InnoDB	latin1_swedish_ci	32 KiB	-
<b>2 tables</b>	<b>Sum</b>	<b>12</b>	<b>InnoDB</b>	<b>latin1_swedish_ci</b>	<b>48 KiB</b>	<b>0 B</b>

Below the table structure, there is a 'Create table' form with a 'Name' field and a 'Number of columns' dropdown set to 4. A 'Go' button is at the bottom right.

### Example: “major” table structure

The screenshot shows the phpMyAdmin interface for the 'major' table. The left sidebar shows the database tree with 'richard\_ricardo\_student\_db' selected, containing tables 'major' and 'student'. The main panel displays the table structure for the 'major' table:

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
1	majorID	int(11)		No	None	AUTO_INCREMENT		Change Drop Primary More
2	majorName	varchar(255)	latin1_swedish_ci	No	None			Change Drop Primary More

Below the table structure, there is an 'Add' button and a 'Go' button. The 'Information' tab is active, showing the following details:

Space usage		Row statistics	
Data	16 KiB	Format	Compact
Index	0 B	Collation	latin1_swedish_ci
Total	16 KiB	Next autoindex	4
		Creation	Sep 16, 2014 at 10:41 PM

## Example: “student” table structure

The screenshot shows the phpMyAdmin interface for the 'student' table. The table structure is as follows:

#	Name	Type	Collation	Attributes	Null	Default	Extra	Action
1	studentID	int(11)			No	None	AUTO_INCREMENT	Change Drop Primary More
2	majorID	int(11)			No	None		Change Drop Primary More
3	firstName	varchar(255)	latin1_swedish_ci		No	None		Change Drop Primary More
4	lastName	varchar(255)	latin1_swedish_ci		No	None		Change Drop Primary More
5	gender	char(1)	latin1_swedish_ci		No	None		Change Drop Primary More

Below the table structure, there is an 'Information' tab with the following data:

Space usage		Row statistics	
Data	16 KiB	Format	Compact
Index	16 KiB	Collation	latin1_swedish_ci
Total	32 KiB	Next autoindex	12
		Creation	Sep 16, 2014 at 10:41 PM

## Example: records in “major” table

The screenshot shows the phpMyAdmin interface for the 'major' table. The table structure is as follows:

majorID	majorName
1	Computer Science
2	Electrical Engineering
3	Business

The interface also shows a message: "Showing rows 0 - 2 (3 total. Query took 0.0005 seconds.)" and a SQL query: "SELECT \* FROM 'major'".

## Example: “records” in student table

The screenshot shows the phpMyAdmin interface for the 'student' table in the 'richard\_ricardo\_student\_db' database. The table contains 11 records with columns: studentID, majorID, firstName, lastName, and gender. The records are as follows:

studentID	majorID	firstName	lastName	gender
1	1	PO	BLACK	M
2	1	SHIFU	HOFFMAN	M
3	1	TIGRESS	JOLIE	F
4	1	JENNIFER	YUH	F
6	2	MONKEY	CHAN	M
8	2	MANTIS	ROGEN	M
9	3	CRANE	CROSS	M
10	3	OOGWAY	KIM	M
11	3	PING	HONG	M

## Example: data privileges for user richardricardo1

The screenshot shows the 'Edit Privileges' page for the user 'richardricardo1' at 'localhost'. The 'Database-specific privileges' section shows the following table:

Database	Privileges	Grant	Table-specific privileges	Action
richard_ricardo_student_db	SELECT, INSERT, UPDATE, DELETE	No	No	Edit Privileges, Revoke

Below the table, there is a form to 'Add privileges on the following database:' with a dropdown menu set to 'Use text field:' and an empty input field.

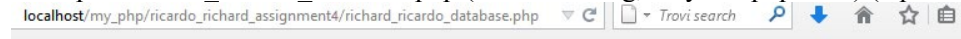
## Question 2 – Display: PHP Chapter 4, eg009 and knowledge of SQL (35 points)

Estimated time: 4 hours

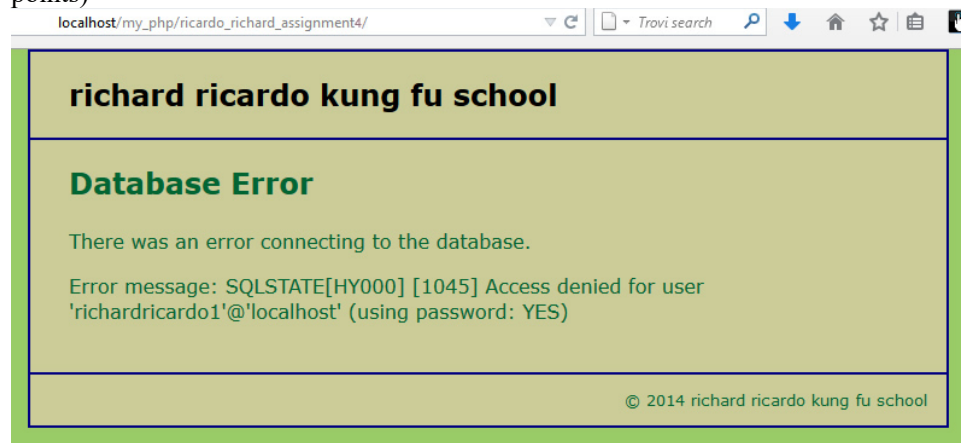
- Save question 2 files in “lastname\_firstname\_assignment4”: (4 points)
  - index.php
  - main.css
  - richard\_ricardo\_database.php
  - richard\_ricardo\_database\_error.php
- Create web page(s) that displays the default information (example shown).
- The initial page and related outputs should look like the examples shown below.
- Create your page(s) using “richard ricardo’s kung fu school” as the page title(s) (<title> tag). (2 points)
- Save the first page as index.php. (1 point)

- Create file `richard_ricardo_database.php` (php code only, no html code) to connect to database
  - Use PDO (PHP Data Object) to interface with your MySQL database.
  - Connect to the **richard\_ricardo\_student\_db** MySQL database (created in Q1), using username **richardricardo1** with password **richardisgreat**.
  - Use `try {} catch () {}` exception handling to detect if the connection is successful.
  - If the connection is not successful, show an error page **richard\_ricardo\_database\_error.php**.
- Create a css file named **main.css** to format all pages by creating your own layout (no two students should have the same layout). You should use **the same css file** to format all questions. (6 points)
- `index.php`
  - Uses **richard\_ricardo\_database.php** to connect to the database.
  - The sidebar on the left displays a list of majors from the “major” table (created in Q1).
  - The main portion of the page lists the students from the “student” table (created in Q1), for that major.
  - If a user wants to view the students in another major, the user can click on the link for that major.
  - The display on the main portion of the page changes accordingly as shown in examples.

Example: `richard_ricardo_database.php` (shows nothing, only has php code) (3 points)



Example: `richard_ricardo_database_error.php` (shows this if something is wrong with database connection) (4 points)



Example: index.php (first major is selected/clicked) (15 points)

localhost/my\_php/ricardo\_richard\_assignment4/ Trove search

## Richard Ricardo Kung Fu School - Students

### Student List

**Majors**

- [Computer Science](#)
- [Electrical Engineering](#)
- [Business](#)

**Computer Science**

Student ID	First Name	Last Name	Gender	
1	PO	BLACK	M	<a href="#">Delete</a>
2	SHIFU	HOFFMAN	M	<a href="#">Delete</a>
3	TIGRESS	JOLIE	F	<a href="#">Delete</a>
4	JENNIFER	YUH	F	<a href="#">Delete</a>

[Add Student](#)  
[List / Add Major](#)

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Example: index.php (second major is selected/clicked)

localhost/my\_php/ricardo\_richard\_assignment4/?major\_id=2 Trove search

## Richard Ricardo Kung Fu School - Students

### Student List

**Majors**

- [Computer Science](#)
- [Electrical Engineering](#)
- [Business](#)

**Electrical Engineering**

Student ID	First Name	Last Name	Gender	
6	MONKEY	CHAN	M	<a href="#">Delete</a>
8	MANTIS	ROGEN	M	<a href="#">Delete</a>

[Add Student](#)  
[List / Add Major](#)

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Example: index.php (third major is selected/clicked)

Richard Ricardo Kung Fu School - Students

Student List

Majors

- [Computer Science](#)
- [Electrical Engineering](#)
- [Business](#)

Business

Student ID	First Name	Last Name	Gender	
9	CRANE	CROSS	M	Delete
10	OOGWAY	KIM	M	Delete
11	PING	HONG	M	Delete

[Add Student](#)

[List / Add Major](#)

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**Question 3 – Delete Student:** PHP Chapter 4, eg009 and SQL (20 points)

**Estimated time: 3 hours**

- Save question 3 files in folder “**lastname\_firstname\_assignment4**”. (2 points)
  - **richard\_ricardo\_delete\_student.php**
- The initial page and related outputs should look like the examples shown below.
- Create your page(s) using “richard ricardo’s kung fu school” as the page title(s) (<title> tag). (2 points)
- When a user clicks on a “Delete” link on index.php, (16 points)
  - the user should be directed to **richard\_ricardo\_delete\_student.php**.
  - richard\_ricardo\_delete\_student.php uses **richard\_ricardo\_database.php** to connect to the database.
  - the selected student record will be deleted from the database table “student”.
  - index.php will be shown again with updated records.

Example: index.php, before deletion, click on the delete button on Student ID 4

localhost/my\_php/ricardo\_richard\_assignment4/ ▼ 🔍 Trovi search 📄 🏠 ☆ 📁 👤

## Richard Ricardo Kung Fu School - Students

### Student List

**Majors**

- [Computer Science](#)
- [Electrical Engineering](#)
- [Business](#)

**Computer Science**

Student ID	First Name	Last Name	Gender	
1	PO	BLACK	M	Delete
2	SHIFU	HOFFMAN	M	Delete
3	TIGRESS	JOLIE	F	Delete
4	JENNIFER	YUH	F	Delete

[Add Student](#)

[List / Add Major](#)

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Example: After deletion, student ID 4 was deleted

localhost/my\_php/ricardo\_richard\_assignment4/richard\_ricardo\_delete\_student\_1 ▼ 🔍 Trovi search 📄 🏠 ☆ 📁 👤

## Richard Ricardo Kung Fu School - Students

### Student List

**Majors**

- [Computer Science](#)
- [Electrical Engineering](#)
- [Business](#)

**Computer Science**

Student ID	First Name	Last Name	Gender	
1	PO	BLACK	M	Delete
2	SHIFU	HOFFMAN	M	Delete
3	TIGRESS	JOLIE	F	Delete

[Add Student](#)

[List / Add Major](#)

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**Question 4 – Add Student:** PHP Chapter 4, eg009 and SQL (25 points)**Estimated time: 4 hours**

- Save question 4 files in folder “**lastname\_firstname\_assignment4**”. (2 points)
  - **richard\_ricardo\_add\_student\_form.php**
  - **richard\_ricardo\_add\_student.php**
  - **richard\_ricardo\_error.php**
- The initial page and related outputs should look like the examples shown below.
- Create your page(s) using “richard ricardo’s kung fu school” as the page title(s) (<title> tag). (2 points)
- When a user clicks on “Add Student” link on index.php, (21 points)
  - the user should be directed to richard\_ricardo\_add\_student\_form.php.
  - a link “View All Students” gives the user option to go back to index.php.
  - richard\_ricardo\_add\_student\_form.php uses **richard\_ricardo\_database.php** to connect to the database.
  - A dropdown list will show all majors by retrieve records from “major” database table (created in Q1).
  - After the user keyed in new student data, and press the submit (Add Students) button, richard\_ricardo\_add\_student.php will be used to add student record to the “student” database table, and index.php will be shown again with updated records.
    - richard\_ricardo\_add\_student.php uses **richard\_ricardo\_database.php** to connect to the database.
  - If the user left any textbox empty, richard\_ricardo\_error.php page will be shown.

Example: richard ricardo add student form.php

The screenshot shows a web browser window with the URL `localhost/my_php/ricardo_richard_assignment4/richard_ricardo_add_student_fo`. The page title is "Richard Richardo Kung Fu School - Add Student". The main content area has a green border and contains the following elements:

- Add Student** (Section Header)
- Major:  (dropdown menu)
- First Name:  (dropdown menu)
- Last Name:  (dropdown menu)
- Gender:  (dropdown menu)
- Gender:  (dropdown menu)
- 
- [View All Students](#)

At the bottom of the page, there is a copyright notice: © 2014 richard richardo kung fu school

Example: richard\_ricardo\_add\_student\_form.php, user input

**Richard Richardo Kung Fu School - Add Student**

**Add Student**

Major:

First Name:

Last Name:

Gender:

[View All Students](#)

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Example: after successfully adding student record

**Richard Ricardo Kung Fu School - Students**

**Student List**

**Majors**

[Computer Science](#)

[Electrical Engineering](#)

[Business](#)

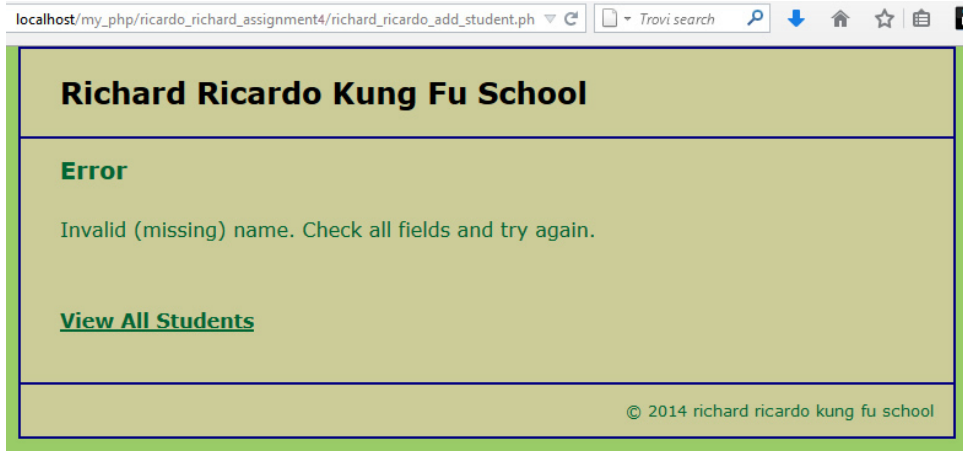
Student ID	First Name	Last Name	Gender	
1	PO	BLACK	M	<input type="button" value="Delete"/>
2	SHIFU	HOFFMAN	M	<input type="button" value="Delete"/>
3	TIGRESS	JOLIE	F	<input type="button" value="Delete"/>
12	JENNY	CHAN	F	<input type="button" value="Delete"/>

[Add Student](#)

[List / Add Major](#)

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Example: richard\_ricardo\_error.php page: If any textbox is left empty, richard\_ricardo\_error.php page will be shown.



**Question 5 Extra Credit – List / Add Major: (20 points) Estimated time: 4 hours**

- Save question 5 files in folder “lastname\_firstname\_assignment4”. (1 point)
  - richard\_ricardo\_major\_list.php
  - richard\_ricardo\_delete\_major.php
  - richard\_ricardo\_add\_major.php
- The initial page and related outputs should look like the examples shown below.
- Create your page(s) using “richard ricardo’s kung fu school” as the page title(s) (<title> tag). (1 point)
- When a user click on a “List / Add Major” link on index.php, (2 points)
  - the user should be directed to **richard\_ricardo\_major\_list.php**.
  - richard\_ricardo\_major\_list.php uses **richard\_ricardo\_database.php** to connect to the database.
  - records from the “major” table will be displayed.
- When the user click on “Add” button without keying in anything, richard\_ricardo\_error.php page (created in Q4) will be shown. (4 points)
- When the user key in some major, and click on “Add” button, (4 points)
  - the user should be directed to richard\_ricardo\_add\_major.php.
  - richard\_ricardo\_add\_major.php uses **richard\_ricardo\_database.php** to connect to the database.
  - user input will be added to “major” database table.
  - richard\_ricardo\_major\_list.php will be shown again with updated records.
- When the user click on a “Delete” link on richard\_ricardo\_major\_list.php, (8 points)
  - the user should be directed to **richard\_ricardo\_delete\_major.php**.
  - richard\_ricardo\_delete\_major.php uses **richard\_ricardo\_database.php** to connect to the database.
  - the selected major record will be deleted from the database table “major”.
  - richard\_ricardo\_major\_list.php will be shown again with updated records.
  - Due to foreign key referencing, user should not be able to delete any “major” record with “student” record linked to it (Q1).

Example: richard\_ricardo\_major\_list.php

localhost/my\_php/ricardo\_ricardo\_assignment4/richard\_ricardo\_major\_list.php

## Richard Ricardo Kung Fu School - Majors

### Major List

Name	
Computer Science	Delete
Electrical Engineering	Delete
Business	Delete

**Add Major**

Major Name:  Add

[List Students](#)

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Example: richard\_ricardo\_error.php (user click on “Add” without textbox input)

localhost/my\_php/ricardo\_ricardo\_assignment4/richard\_ricardo\_add\_major.php

## Richard Ricardo Kung Fu School

### Error

Invalid (empty) major data. Check all fields and try again.

[View All Students](#)

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Example: richard\_ricardo\_major\_list.php (user input "biology")

localhost/my\_php/ricardo\_ricardo\_assignment4/richard\_ricardo\_major\_list.php

## Richard Ricardo Kung Fu School - Majors

### Major List

Name	
Computer Science	Delete
Electrical Engineering	Delete
Business	Delete

**Add Major**

Major Name:

[List Students](#)

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Example: richard\_ricardo\_major\_list.php (after user input)

localhost/my\_php/ricardo\_ricardo\_assignment4/richard\_ricardo\_add\_major.php

## Richard Ricardo Kung Fu School - Majors

### Major List

Name	
Computer Science	Delete
Electrical Engineering	Delete
Business	Delete
Biology	Delete

**Add Major**

Major Name:

[List Students](#)

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Example: richard\_ricardo\_major\_list.php (user to click on “Delete” next to “biology”)

localhost/my\_php/ricardo\_richard\_assignment4/richard\_ricardo\_add\_major.php

## Richard Ricardo Kung Fu School - Majors

### Major List

Name	
Computer Science	Delete
Electrical Engineering	Delete
Business	Delete
Biology	Delete

**Add Major**

Major Name:

[List Students](#)

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Example: richard\_ricardo\_major\_list.php (show updated records)

localhost/my\_php/ricardo\_richard\_assignment4/richard\_ricardo\_delete\_major.pt

## Richard Ricardo Kung Fu School - Majors

### Major List

Name	
Computer Science	Delete
Electrical Engineering	Delete
Business	Delete

**Add Major**

Major Name:

[List Students](#)

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**Important:**

1. If you do not put `<your name>` / `<your first name>` in the above mentioned fields (as shown in the examples), you will get **0 points** for the question(s).
2. **No two students** should submit webpages with exactly the same code, content, layout, or color combination. If found, both students will get **0 points**.
3. When you view page source in a web browser, `<!DOCTYPE html>` must be at the top of every page. In other words, all pages must be written in HTML5. (**-20 points** if not)
  - You **can** put php code before `<!DOCTYPE html>`.
  - You **cannot** put html code before `<!DOCTYPE html>`.
4. Before adding PHP code, all html files must pass html validation at <http://validator.w3.org/> without any **error** (and with only 1 warning).
5. After adding PHP code, the generated html code (Firefox web browser > right-click > view page source) must also pass html validation at <http://validator.w3.org/> without any **error** (and with only 1 warning).
6. All css files must pass css validation at <http://jigsaw.w3.org/css-validator/> without any **error/warning**.
7. If your files do not pass the html and css validations, **2 points will be deducted for each html or css error/warning** found (1 warning allowed for html validator).
8. Document (comment) your HTML files (`<!-- -->`), CSS files (`/* */`), and PHP files (`/* */` OR `//`). **Points will be taken off** for insufficient comments (`<!-- -->`, `/* */`, `//`).

**Submission instructions:**

- You need to test all document(s).
- Do screen capture(s) of the **input** and the related **output(s)**. Use any graphic editing software (e.g. Microsoft Paint, Adobe Photoshop, or GIMP etc) to cut out the browser output (from the screen capture), paste them into a word document.
- Provide **2 different test cases** for each question. In other words, for **each question**, you may need to have **2 input** screen captures and **2 related output** screen captures.
- Do NOT need to do screen capture(s) of html validation results and css validation results for this assignment.
- Save the word document as a pdf file.

You need to submit the following:

1. A pdf file containing the screen capture(s) of the web browser input and output pages, name the file **lastname\_firstname\_assignment4.pdf**.
2. All html file(s), php file(s), css file(s), and other related files (e.g. image files). Zip your file folder (**lastname\_firstname\_assignment4**) into a single zip file (or rar file) **lastname\_firstname\_assignment4.zip**. In the above example, the zip file should contain the following files and subfolders. If there is any image, there should be a `\images\` subfolder.

- lastname\_firstname\_assignment4\create\_db.sql
- lastname\_firstname\_assignment4\index.php
- lastname\_firstname\_assignment4\main.css
- lastname\_firstname\_assignment4\richard\_ricardo\_add\_major.php (extra credit)
- lastname\_firstname\_assignment4\richard\_ricardo\_add\_student.php
- lastname\_firstname\_assignment4\richard\_ricardo\_add\_student\_form.php
- lastname\_firstname\_assignment4\richard\_ricardo\_database.php
- lastname\_firstname\_assignment4\richard\_ricardo\_database\_error.php
- lastname\_firstname\_assignment4\richard\_ricardo\_delete\_major.php (extra credit)
- lastname\_firstname\_assignment4\richard\_ricardo\_delete\_student.php
- lastname\_firstname\_assignment4\richard\_ricardo\_error.php
- lastname\_firstname\_assignment4\richard\_ricardo\_major\_list.php (extra credit)

Please submit the above mentioned **two files** (.pdf and .zip) to D2L.

**Grading guidelines (programming questions):**

Your programs will be judged on several criteria, which are shown below.

- Correctness (50%): Does the program compile (run) correctly? Does the program do what it's supposed to do?
- Design (20%): Are operations broken down in a reasonable way (e.g. classes and methods)?
- Style (10%): Is the program **indented** properly? Do variables have **meaningful names**?
- Robustness (10%): Does the program handle erroneous or unexpected input gracefully?
- Documentation (10%): Do all program files begin with a **comment** that identifies the author, the course code, and the program date? Are all the classes, methods and data fields clearly **documented (commented)**? Are unclear parts of code **documented (commented)**? (Some items mentioned may not apply to some languages)

A program that does not compile (run) will get at most **50% of the possible points**.