pset 7: C$50 Finance

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Toolbox

- ☐ permissions
- ☐ HTML
- ☐ PHP
- ☐ SQL

permissions

- use `chmod` in the Terminal to change permissions of files and folders
- `chmod a+x folder`
  - `folder` executable by everyone
- `chmod a+r css/* img/* js/*`
  - everything in `css`, `img`, `js` directory readable by everyone

permissions

rwx	111	7
rw	110	6
rx	101	5
r	100	4
wx	011	3
w	010	2
x	001	1

permissions

- folders: `chmod 711 folder`
- images, HTML, CSS, js: `chmod 644 file`
  - users shouldn't execute an image!
- php files: `chmod 600 file`
  - users shouldn't see your PHP code!

PHP

- files end in `.php`
- can mix HTML with php code
  - enclosed in `<?php  ?>`
- variables
  - start with `$`
  - weakly typed
- associative arrays!
  - `$arr =["a" => 1, "b" => 2, "c" => 3];`
  - `$arr["a"]` equals 1

C$50 Finance

0. A Section of Questions
1. CS50 Finance
    1. register
    2. quote
    3. portfolio
    4. buy
    5. sell
    6. history
    7. extra feature

Setup

- `cd ~/vhosts/localhost`
- `unzip pset7.zip`
- `chmod` the files and directories
- visit http://localhost/ inside the appliance

Distribution Code

- `html`
- `includes`
- `templates`

includes/functions.php

- apologize
- dump
- logout
- lookup($symbol)
  - returns a stock symbol
- query
  - executes SQL statement
- redirect
- render
  - outputs a template

register

- Display form
- Check passwords: not blank, match
- Add user to database
- Log them in

display form

- copy `login.php` and `login_form.php`
- `<form action="register.php" method="post">`
  - send data to `register.php` instead
- Need to make a password `confirmation` field

register

- ☑ Display form
- ☐ Check passwords: not blank, match
- ☐ Add user to database
- ☐ Log them in

valid passwords?

- make sure `$_POST["password"]` and `$_POST["confirmation"]` aren't blank
  - else, apologize

- make sure `$_POST["password"]` and `$_POST["confirmation"]` are the same
  - else, apologize
  - `"omg" == "omg"` in PHP!!
  - goobye, `strcmp`!

apologies

- apologize("Passwords do not match!");

register

- ☑ Display form
- ☑ Check passwords: not blank, match
- ☐ Add user to database
- ☐ Log them in

usernames

- make sure `$_POST["username"]` isn't blank, else apologize

- usernames are a `UNIQUE` field in the database

- `query` returns `false` on failure
  - `$result = query(…)`
  - `if ($result === false)`
    - then an error occurred (e.g., duplicate username)

SQL Queries: INSERT

```
INSERT INTO users (username, hash, cash)
  VALUES ("zamyla",
  '$1$50$Suq.MOtQj51maavfKvFsW1',
  10000.00)
```

- ❑ inserts a new row into users

query

- ? is a placeholder

- ```
  query("INSERT INTO users (username,
  hash, cash) VALUES(?, ?, 10000.00)",
  $_POST["username"],
  crypt($_POST["password"]));
  ```

query

- ? is a placeholder
- query("SELECT * FROM users WHERE username = ?", $_POST["username"]);

register

- ☑ Display form
- ☑ Check passwords: not blank, match
- ☑ Add user to database
- ☐ Log them in

logging in

- once they register successfully, should be logged in automatically
- Find out their id

```
$rows = query("SELECT LAST_INSERT_ID() AS id");
$id = $rows[0]["id"];
```

- Store their id in session
  - `$_SESSION`

register

- ☑ Display form
- ☑ Check passwords: not blank, match
- ☑ Add user to database
- ☑ Log them in

quote

- form for search
- retrieve stock quote
- display stock quote

form

- form in `quote.php`
  - input: `symbol` the user wants to look up
- send data to `quote_form.php`

quote

- ☑ form for search
- ❑ retrieve stock
- ❑ display stock information

lookup

```
$s = lookup("AAPL")
```

- returns an associative array
  - symbol
  - name
  - price

quote

- ☑ form for search
- ☑ retrieve stock
- ☐ display stock quote

displaying stock information

- at minimum, display quote
- ensure the stock is valid
  - else: `apologize`, as usual

```
print("Price: " . $s["price"]);
```

But, need to format to 2 to 4 decimal places, as with `number_format`.

quote

- ☑ form for search
- ☑ retrieve stock
- ☑ display stock quote

portfolio

- portfolio table
- displaying the portfolio

portfolio table

users
id
username
hash
cash

portfolios
id
symbol
shares

portfolio

- ☑ portfolio table
- ❑ displaying the portfolio

displaying the portfolio

- report, at minimum:
  - each of the stocks in a user's portfolio
    - number of shares
    - current value (price times number)
  - user's current cash balance

displaying the portfolio

- `index.php` is the *controller*
  - `render("portfolio.php", ...);`
- `portfolio.php` is the *template*
  - what variables does it need?

displaying the portfolio

- query returns an array of rows

```
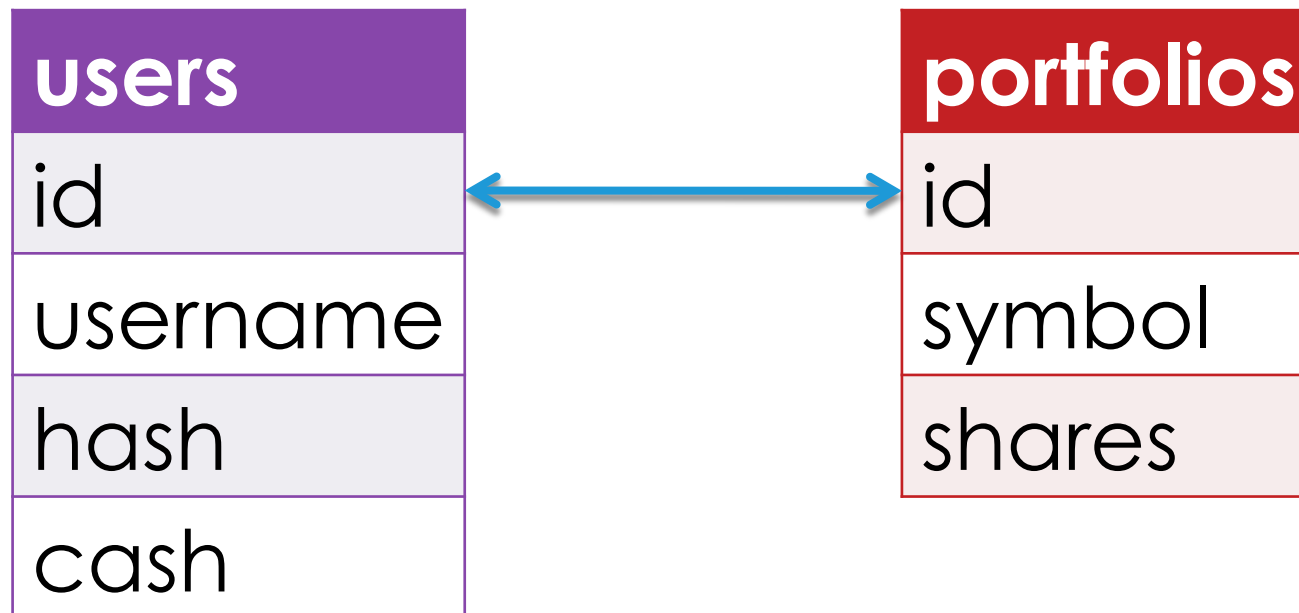$rows = query("SELECT symbol, shares FROM tbl
   WHERE id = ?", $_SESSION["id"]);
foreach ($rows as $row)
{
  print("<tr>");
  print("<td>{$row["symbol"]}</td>");
  print("<td>{$row["shares"]}</td>");
  print("</tr>");
}
```

buying stocks

- get stock, number of shares
- add stock to portfolio
- update cash

form

- HTML form
- ask for `symbol` and number of `shares`

buying stocks

- ☑ get stock, number of shares
- ☐ add stock to portfolio
- ☐ update cash

SQL Queries: SELECT

`SELECT * FROM users WHERE username = "skroob"`

- gets the data from every column
- in the table called `users`
- only if the username column has the value `skroob`

adding shares to portfolio

- error-checking!
- can the user afford the stock?

```
SELECT cash FROM users WHERE id = 7
```

- buying the same stock

```
INSERT INTO portfolio (id, symbol, shares)
   VALUES(7, 'DVN.V', 10) ON DUPLICATE KEY
   UPDATE shares = shares + VALUES(shares)
```

buying stocks

- ☑ get stock, number of shares
- ☑ add stock to portfolio
- ☐ update cash

update cash

□ a user's cash is stored in the `users` table

`UPDATE users SET cash = cash – 9999 WHERE id = 7`

□ price of the stock * number of shares

buying stocks

- ☑ get stock, number of shares
- ☑ add stock to portfolio
- ☑ update cash

selling stocks

- get stock to sell
- remove stock from portfolio
- update cash

selling stocks

- display the user's stocks

```
SELECT * FROM portfolio WHERE id = 7
```

- delete stock from user's portfolio

```
DELETE FROM portfolio WHERE id = 7 AND symbol =
    "AAPL"
```

- update cash
  - stock is sold at its **current** price

selling stocks

- ☑ get stock to sell
- ☑ remove stock from portfolio
- ☑ update cash

history

- keep track of all transactions

history

- `history` table
- every purchase and sale
  - add a row to `history`
  - store the timestamp of the transaction
    - `NOW()`
    - `CURRENT_TIMESTAMP`

`index.php`

- must link to, at minimum:
  - `buy.php`
  - `history.php`
  - `logout.php`
  - `quote.php`
  - `sell.php`

1 Extra Feature!

1 Extra Feature

- Password change
- Password reset
  - registration takes an email address
  - email a link to reset password
- Email users "receipts" anytime they buy or sell stocks.
- Add cash

have fun!

this was walkthrough 7

these were psets

these were
walkthroughs