CS 50 Walkthrough 7
Problem Set 7: C$50 Finance

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(slides courtesy of Keito)

Problem Set 7: C$50 Finance

- Topics:
  - Web programming
  - PHP
  - MySQL
- You implement:
  - A stock buying/selling/portfolio viewing/history viewing website

Permissions on the web

- **Static content** (.html, .png, .jpg, .css, .js, etc.): readable by "others", read-write by "owner"
  - chmod 644 name
- **Directories** (including your home directory, public_html, and any directories within): executable by "others", read-write-execute by "owner"
  - chmod 711 name
- **PHP scripts** (.php): read-write by "owner"
  - chmod 600 name

Permissions

```
Read:    r = 100 (4)
Write:   w = 010 (2)
Execute: x = 001 (1)
```
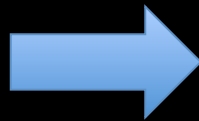
```
rwx (4 + 2 + 1 = 7)
rw_ (4 + 2 + 0 = 6)
r_x (4 + 0 + 1 = 5)
r__ (4 + 0 + 0 = 4)
_wx (0 + 2 + 1 = 3)
_w_ (0 + 2 + 0 = 2)
__x (0 + 0 + 1 = 1)
```



```
Owner/Group/Others
rwx rwx rwx = 777
r_x r_x x__ = 551
rw_ ___ rw_ = 606
```

Distribution code

- index.php – homepage
- common.php – included in index.php
- stock.php – class for stock, similar to C struct
- login.php – form for logging in via POST
- login2.php –starts session
- helpers.php – lookup(), dump(), apologize()

Features you need to implement

- User registration
- Get quotes
- Maintaining a Portfolio
- Buying
- Selling
- History

MySQL

- Login to database
- Three "steps" to manipulating tables
  - $query = create query with INSERT, SELECT, UPDATE or DELETE
  - $result = mysql_query($query)
  - $row = mysql_fetch_array($result)
    - $row["uid"]

register.php

- copy login.php and login2.php using cp
  - change head's title
  - change login2.php to register2.php
  - add password2 field
  - change submit button to say register
  - change link to login

register2.php

- If any field is blank or password and password2 don't match, apologize.

- Otherwise
  - $sql = INSERT INTO users (username, password, cash) VALUES('$username', '$password', 10000.00);
  - $result = mysql_query($sql);
    - if NULL, apologize!
  - $_SESSION["uid"] = mysql_insert_id();

Get Quotes!

- quote.php
  - `<form action="quote2.php" method="post">`
  - similar to login.php
- quote2.php
  - $symbol = mysql_real_escape_string($_POST["symbol"]);
  - $quote = lookup($symbol)
  - A share of `<? print($quote->name); ?>` currently costs $`<? print($quote->price); ?>`.

Additional Databases

- Portfolio:
  - What columns do we want?
    - uid (user ID of owner)
    - symbol
    - shares (number of shares)
- History
  - uid
  - bought or sold
  - shares and price
  - date and time

Buy!

- buy.php
  - <form action="buy2.php" method="post">
    - need stock symbol, and number of shares
- buy2.php
  - $uid = $_SESSION["uid"]; stores current user
  - add stock to portfolio
    - INSERT like in register2.php but into portfolio table
  - charge user
    - UPDATE user table
  - log transaction in history
    - INSERT into history table

Buy Continued

- $s = lookup($symboltobuy); is stock "struct"
- $cost = ($numshares* $s->price);
- $userrow = mysql_fetch_assoc($user);
  - if($userrow["cash"] < $cost)
    - apologize!
  - else
    - UPDATE users SET cash=cash-$money WHERE uid =%d", $uid);

Sell!

- Extremely similar to buy
- If user owns the stock
  - $remove = sprintf("DELETE FROM Portfolio WHERE uid =%d AND symbol='%s'", $uid, $symboltosell);
  - refund their money
    - look up price in portfolio * number of shares
  - log in history table

History

- $history = sprintf("SELECT * FROM transactions WHERE uid=%d", $uid);

- while ($row=mysql_fetch_array($result))
    print($row["symbol"]);

    …

When you think you're done…

- Does your site work across browsers?
- Is your input validation sufficient (very important!)
  - Empty values
  - Negative shares
  - Fractional shares
  - etc.
- Do you check for failure (NULL) of, say, mysql_query()?

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