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)

\[
\begin{align*}
\text{rwx} & \ (4 + 2 + 1 = 7) \\
\text{rw} & \ (4 + 2 + 0 = 6) \\
\text{r}_x & \ (4 + 0 + 1 = 5) \\
\text{r} & \ (4 + 0 + 0 = 4) \\
\_wx & \ (0 + 2 + 1 = 3) \\
\_w & \ (0 + 2 + 0 = 2) \\
\_x & \ (0 + 0 + 1 = 1) \\
\end{align*}
\]

Owner/Group/Others

\[
\begin{align*}
\text{rwx} & \ \text{rwx} \ \text{rwx} = 777 \\
\text{r}_x & \ \text{r}_x \ \text{x__} = 551 \\
\text{rw} & \ \text{____} \ \text{rw} = 606
\end{align*}
\]
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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