

pset7: C\$50  
Finance

Tommy  
MacWilliam

Permissions

PHP

Registration

Stock Quotes

Buying Stocks

Selling Stocks

History

# pset7: C\$50 Finance

Tommy MacWilliam

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October 30, 2011

# Today's Music

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History

- ▶ Basshunter
  - ▶ Angel in the Night
  - ▶ Plane to Spain
  - ▶ Boten Anna
  - ▶ Ievas Polka

# Today

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History

- ▶ permissions
- ▶ PHP
- ▶ registration
- ▶ stock quotes
- ▶ buying stock
- ▶ selling stock
- ▶ maintaining history

# public\_html

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History

- ▶ `mkdir ~/public_html`
- ▶ `cd ~/public_html`
- ▶ `git clone`  
`http://cdn.cs50.net/2011/fall/psets/7/pset7.git`

# Permissions

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History

- ▶ `chmod`: change permissions of file or folder
- ▶ `chmod a+x ~`
  - ▶ make `~` executable for all users

# Permissions

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History

- ▶ `chmod a+x ~ ~/public_html ~/public_html/pset7`
  - ▶ make home directory executable by everyone
- ▶ `chmod a+r css/* images/*`
  - ▶ make all CSS and image files readable by everyone
  - ▶ can't execute an image as a program!

# Permissions

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History

▶ `chmod 644 file`

<code>rwX</code>	<code>111</code>	<code>7</code>
<code>rw</code>	<code>110</code>	<code>6</code>
<code>rx</code>	<code>101</code>	<code>5</code>
▶ <code>r</code>	<code>100</code>	<code>4</code>
<code>wX</code>	<code>011</code>	<code>3</code>
<code>w</code>	<code>010</code>	<code>2</code>
<code>x</code>	<code>001</code>	<code>1</code>

# Permissions Cheat Sheet

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History

- ▶ **folders:** `chmod 711 folder`
- ▶ **image, HTML, CSS, and Javascript files:** `chmod 644 logo.png`
- ▶ **PHP files:** `chmod 600 file.php`

# Home Page

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History

- ▶ create new `index.html`
  - ▶ don't forget to `chmod 644 index.html`
- ▶ make it pretty!
- ▶ visit `http://localhost/~jharvard`
- ▶ validate HTML with `http://validator.w3c.org`

# PHP in 10 Seconds

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History

- ▶ files end in `.php`
- ▶ code enclosed between `<?php ?>`
- ▶ variables start with `$`
- ▶ variables are weakly typed

# PHP in 10 Seconds

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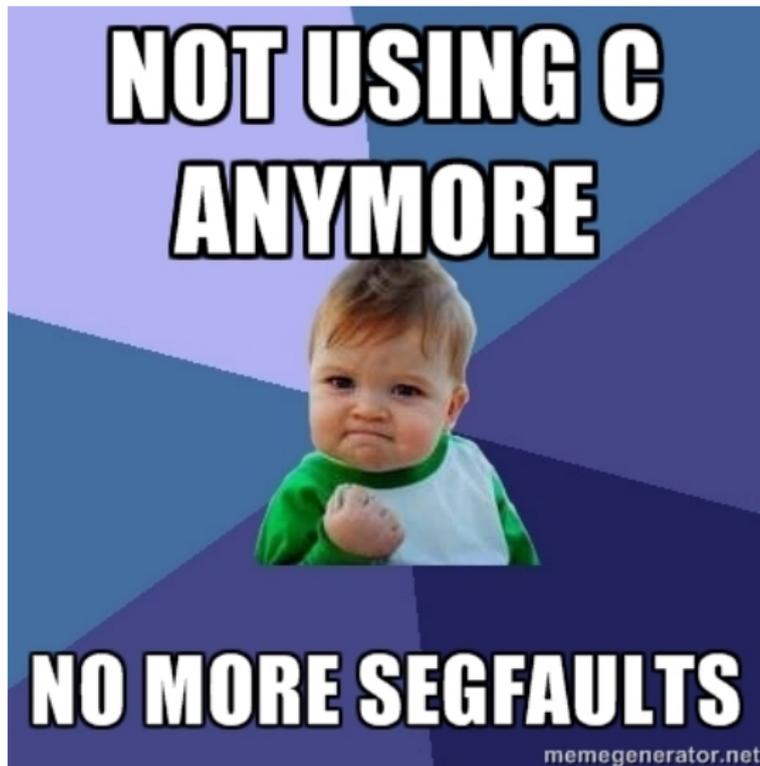
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History



# Distro Code

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History

- ▶ `index.php`: homepage
- ▶ `common.php`: code run before each page loads
- ▶ `constants.php`: database information
- ▶ `helpers.php`: helpful functions like `lookup()`
- ▶ `stock.php`: definition of `Stock` struct
- ▶ `login.php`: display login form
- ▶ `login2.php`: process login

# login2.php

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History

- ▶ get username and password from `$_POST`
- ▶ look up user from database based on username
- ▶ compare hash of inputted password to hash of password in database
  - ▶ if matching, remember the ID of the user in `$_SESSION`
  - ▶ `$_SESSION` data persists across pages

# SELECT

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History

- ▶ `SELECT * FROM users WHERE username = "malan"`
  - ▶ get the data from every column
  - ▶ in a table called `users`
  - ▶ only if the `username` column has the value `malan`

# Conditions

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History

- ▶ `SELECT * FROM users WHERE username = "malan" OR cash < 9000`
- ▶ `SELECT username, hash FROM users WHERE username != "malan"`
- ▶ `SELECT COUNT(*) FROM users WHERE cash > 9000`

# Using SQL

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History

- ▶ `mysql_connect(DB_SERVER, DB_USERNAME, DB_PASSWORD)`: connect to database
- ▶ `mysql_select_db(DB_NAME)`: specify database to operate within
- ▶ `$query = "SELECT * FROM users"`: create database query
- ▶ `$result = mysql_query($query)`: run database query
- ▶ `$row = mysql_fetch_array($result)`: convert result to PHP associative array, one row at a time

# TODO

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History

1. display form
2. check if passwords match
3. check if username already exists
4. add row to database

# Forms

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History

- ▶ `cp login.php register.php`
- ▶ `<form action="login2.php" method="post">`
  - ▶ needs to send data to `register2.php` instead!
- ▶ also need to create a new `password2` field

# TODO

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History

1. ~~display form~~
2. check if passwords match
3. check if username already exists
4. add row to database

# Matching Passwords

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History

- ▶ make sure `$_POST["password"]` and `$_POST["password2"]` aren't blank, else apologize
  - ▶ check out the function `empty()`
- ▶ make sure `$_POST["password"]` and `$_POST["password2"]` are the same
  - ▶ `"tommy" == "tommy"` in PHP
  - ▶ woohoo!

# TODO

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History

1. ~~display form~~
2. ~~check if passwords match~~
3. check if username already exists
4. add row to database

# Duplicate Usernames

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History

- ▶ make sure `$_POST["username"]` isn't blank, else apologize
- ▶ `mysql_query` returns `NULL` on failure
  - ▶ `username` is `UNIQUE` in the database

# TODO

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History

1. ~~display form~~
2. ~~check if passwords match~~
3. ~~check if username already exists~~
4. add row to database

# INSERT

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History

- ▶ `INSERT INTO users (username, hash, cash) VALUES ("tommy", "$1$supersecret", 10000.00)`
  - ▶ modify the users table
  - ▶ new row will have values for username, hash, and cash
  - ▶ values for row are "tommy", "\$1\$supersecret", and 10000.00

# Hashing

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History

- ▶ when logging in, we use the `crypt` of a password
- ▶ when `INSERTing` values, we need to use `crypt($_POST["password"])`

# Logging In

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History

- ▶ new user should be logged in automatically!
  - ▶ what happens when a user logged in?
  - ▶ `$_SESSION`

# TODO

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History

1. ~~display form~~
2. ~~check if passwords match~~
3. ~~check if username already exists~~
4. ~~add row to database~~

# TODO

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History

- ▶ retrieve stock information
- ▶ display quote

# Form

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History

- ▶ need a form in `quote.php` that sends data to `quote2.php`
- ▶ single row: `symbol` the user wants to look up

# lookup

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History

- ▶ `$s = lookup("AAPL")`
  - ▶ returns a Stock object (just like a C struct)
  - ▶ defined in `stock.php`

# Stock

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History

- ▶ `$s->symbol == "AAPL"`
- ▶ `$s->name == "Apple, Inc."`
- ▶ `$s->price == 404.95`

# TODO

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History

- ▶ retrieve stock information
- ▶ display quote

# Displaying Quote

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History

- ▶ `quote.php` prompts for symbol, `quote2.php` displays result
- ▶ make sure quote is valid, else apologize
- ▶ `print("Price: " . $s->price);`
- ▶ `printf("Price: %d", $s->price);`
- ▶ `printf("Price: {$s->price}");`

# TODO

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History

- ▶ retrieve stock information
- ▶ display quote

# TODO

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History

- ▶ create new table for portfolios
- ▶ prompt user for symbol and shares
- ▶ add stock to portfolio if possible
- ▶ subtract cash

# Portfolio Table

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History

- ▶ no room in our users table for stock information!
  - ▶ good thing a single database can have multiple tables
- ▶ need to keep track of user, stock, and how many shares
  - ▶ `id VARCHAR`
  - ▶ `symbol VARCHAR`
  - ▶ `shares INT`

# Portfolio Table

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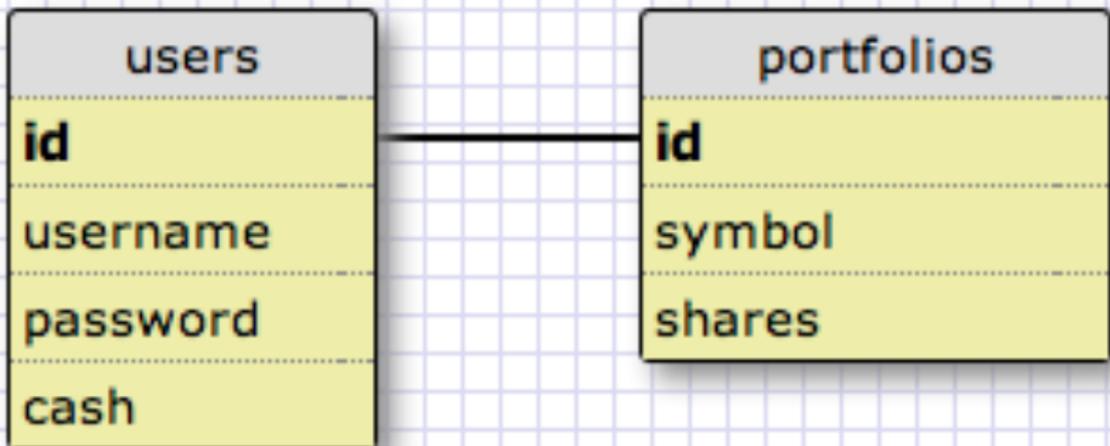
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History



# TODO

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History

- ▶ ~~create new table for portfolios~~
- ▶ prompt user for symbol and shares
- ▶ add stock to portfolio if possible
- ▶ subtract cash

# Form

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History

- ▶ HTML forms are the best
- ▶ need to ask user for `symbol` and number of shares
- ▶ `buy.php?symbol=AAPL`
  - ▶ form is pre-populated with AAPL, woah

# GET

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History

- ▶ `$_POST` contains all data submitted by a form with `method="post"`
- ▶ `$_GET` contains all data submitted by a form with `method="get"`
  - ▶ also puts data in the URL using key-value pairs separated by `&`
  - ▶ `key1=value1&key2=value2`
  - ▶ `$_GET["key1"] == "value1"`
  - ▶ `$_GET["key2"] == "value2"`

# TODO

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History

- ▶ ~~create new table for portfolios~~
- ▶ ~~prompt user for symbol and shares~~
- ▶ add stock to portfolio if possible
- ▶ subtract cash

# Adding Stock

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History

- ▶ don't forget to error-check inputs!
- ▶ make sure user can afford to buy stock
  - ▶ `SELECT cash FROM users WHERE id = 1`
- ▶ what if user buys same stock more than once?
  - ▶ `INSERT` multiple rows with same symbol
  - ▶ use `UPDATE` to only have one row per symbol

# UPDATE

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History

- ▶ `UPDATE users SET username = "n00b" WHERE username = "malan"`
  - ▶ on the table `users`
  - ▶ change the value of the `username` column to `"n00b"`
  - ▶ in every row where `username` is currently `"malan"`

# TODO

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History

- ▶ ~~create new table for portfolios~~
- ▶ ~~prompt user for symbol and shares~~
- ▶ ~~add stock to portfolio if possible~~
- ▶ ~~subtract cash~~

# Subtracting Cash

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History

- ▶ users table keeps track of how much money user has
  - ▶ not portfolio table!
- ▶ `UPDATE users SET cash = cash - 9001 WHERE username = "malan"`
- ▶ remember, price of stock comes from lookup

# TODO

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History

- ▶ ~~create new table for portfolios~~
- ▶ ~~prompt user for symbol and shares~~
- ▶ ~~add stock to portfolio if possible~~
- ▶ ~~subtract cash~~

# TODO

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History

- ▶ remove stocks from portfolio
- ▶ add cash

# Retrieving Stocks

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History

- ▶ need to display a list of stocks to remove to user
- ▶ `SELECT * FROM portfolio WHERE username = "malan"`

# Removing Stocks

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History

- ▶ `DELETE FROM portfolio WHERE username = "malan"  
AND symbol = "AAPL"`
  - ▶ delete rows from the portfolio table
  - ▶ only if the row has a username of "malan" and a symbol of "AAPL"

# TODO

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History

- ▶ ~~remove stocks from portfolio~~
- ▶ add cash

# Add Cash

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History

- ▶ `UPDATE users SET cash = cash + 9001 WHERE username = "malan"`
- ▶ price of stock comes from lookup
  - ▶ remember, stock is sold for **current** price, not for price when stock was purchased

# TODO

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History

- ▶ ~~remove stocks from portfolio~~
- ▶ ~~add cash~~

# History

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History

- ▶ need to keep track of transaction history
  - ▶ store timestamp of transaction with `NOW()` or `CURRENT_TIMESTAMP`
  - ▶ or, use PHP's date
- ▶ new history table that has a row for every transaction made
  - ▶ rows from `portfolio` are updated and deleted, but `history` has a new row for each
- ▶ create new column in `portfolio` that designates if transaction is still valid

# Extra Features

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History

- ▶ change password
- ▶ email receipts
- ▶ deposit additional money