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Welcome to SSL Day 5!

Sessions, Hashing, and Salting

Day 5

Sessions

A session is a method for managing user authentication.

A session ID is stored as a cookie in the browser.

All other session data is stored on the server.

Sessions

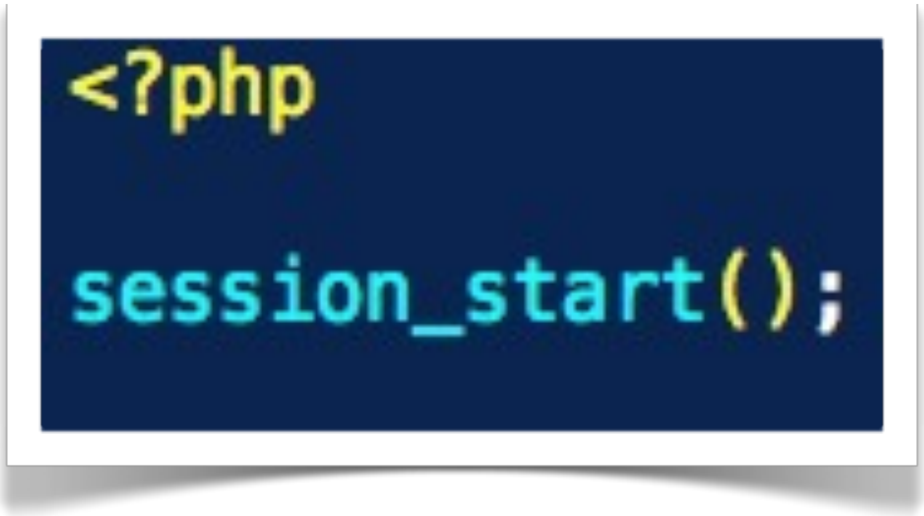
In PHP, we will use the built-in sessions package:

http://www.php.net/manual/en/book.session.php

In Python, we will wait for ASL to
use the Django framework

PHP Sessions

The session_start() method should be at the top of the index file, which all urls are mapped to.



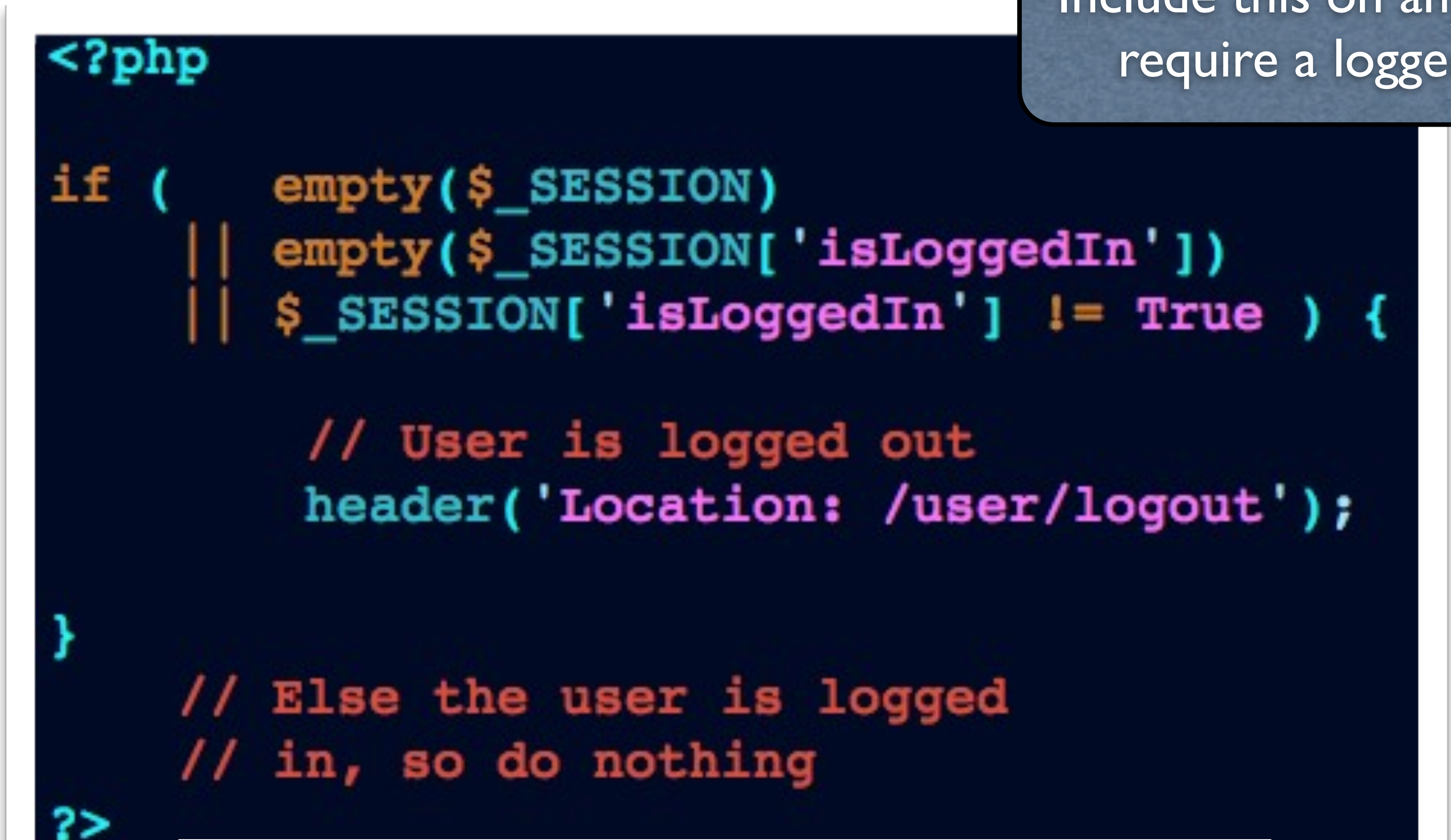
```
<?php

session_start();
```

Then use $_SESSION to get and store information.

Protector

Include this on any pages that require a logged-in user.

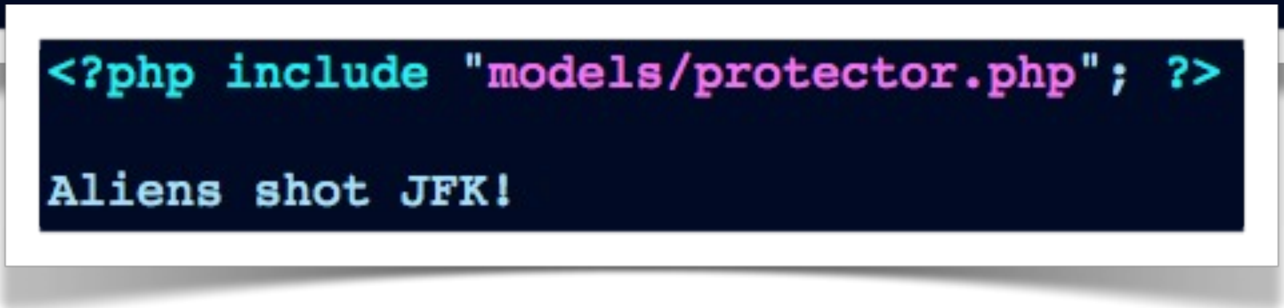


```
<?php

if (    empty($_SESSION)
     || empty($_SESSION['isLoggedIn'])
     || $_SESSION['isLoggedIn'] != True ) {

        // User is logged out
        header('Location: /user/logout');

}
     // Else the user is logged
     // in, so do nothing
?>
```



```
<?php include "models/protector.php"; ?>

Aliens shot JFK!
```

Hashes

A hash is the result of a one-way mathematical algorithm applied to plain-text.

The plain-text is variable length and the hash is of fixed length (32 characters).

Server-Side Languages

Some hash algorithms are:
MD5, SHA-1, SHA-2

These are some MD5 hashes:

“dog”

06d80eb0c50b49a509b49f2424e8c805

"SSL is the most awesome class ever PHP is cool and **P**ython is cool too"

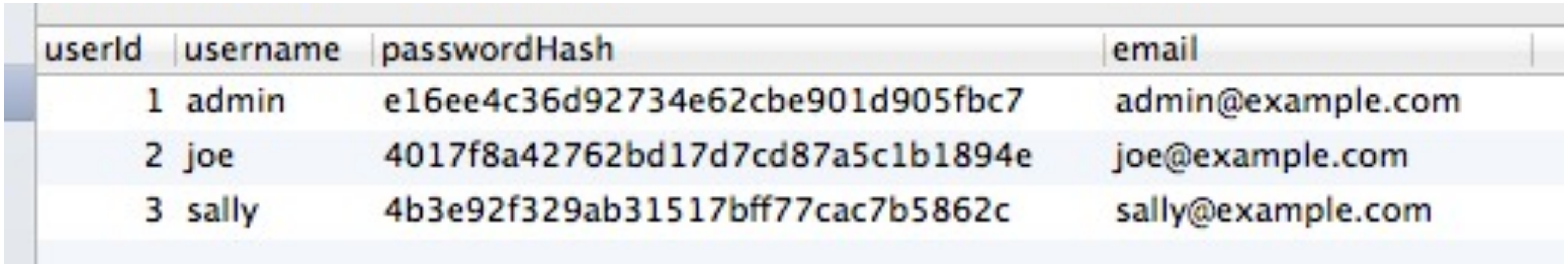
7894ff5c182503c159e0abe05696f56f

"SSL is the most awesome class ever PHP is cool and **p**ython is cool too"

a85ac7187c8292f1ea76f6cb84c30ed8

Server-Side Languages

Hashes are kept in the database



userId	username	passwordHash	email
1	admin	e16ee4c36d92734e62cbe901d905fbc7	admin@example.com
2	joe	4017f8a42762bd17d7cd87a5c1b1894e	joe@example.com
3	sally	4b3e92f329ab31517bff77cac7b5862c	sally@example.com

When a user logs in, the typed password is hashed and compared to the hash in the database.

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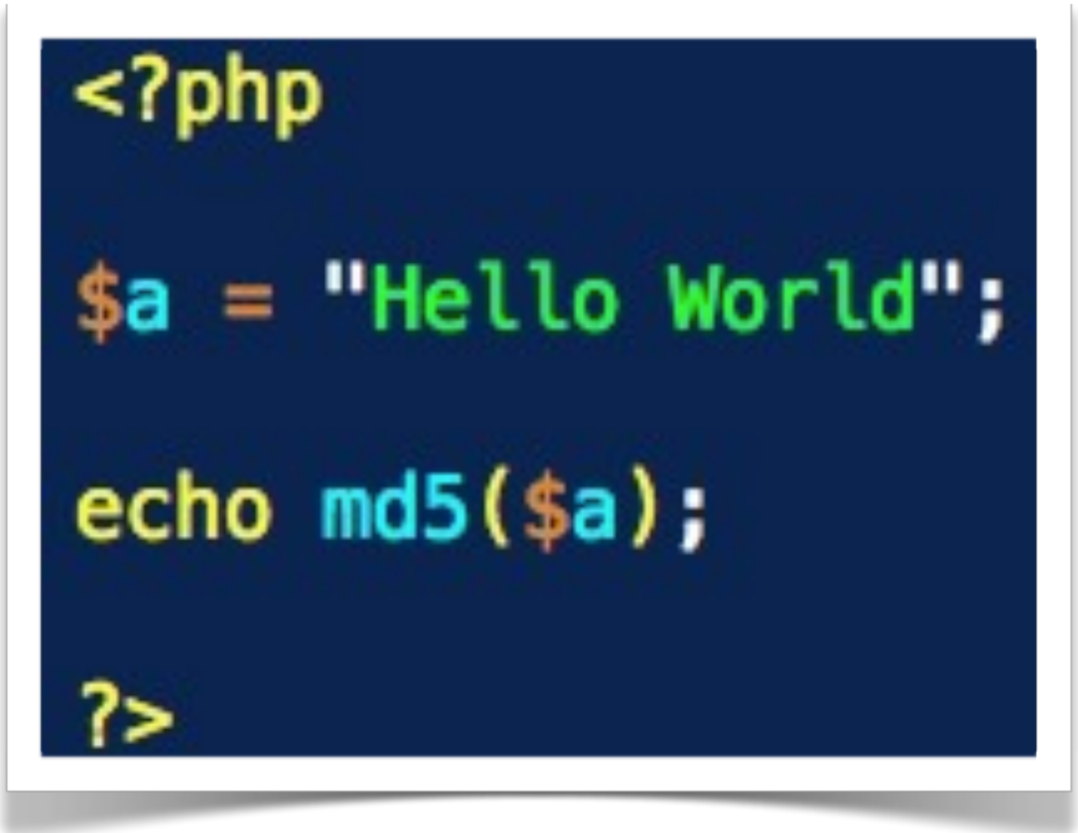
Server-Side Languages

The MD5 function in PHP

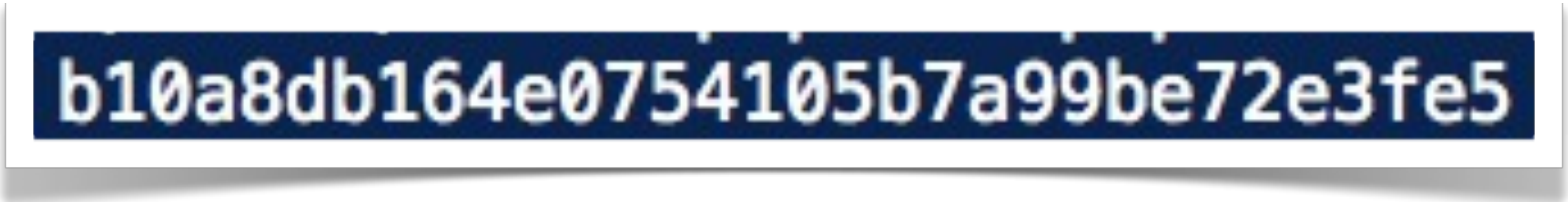


```php
<?php

$a = "Hello World";

echo md5($a);

?>
```



```
b10a8db164e0754105b7a99be72e3fe5
```

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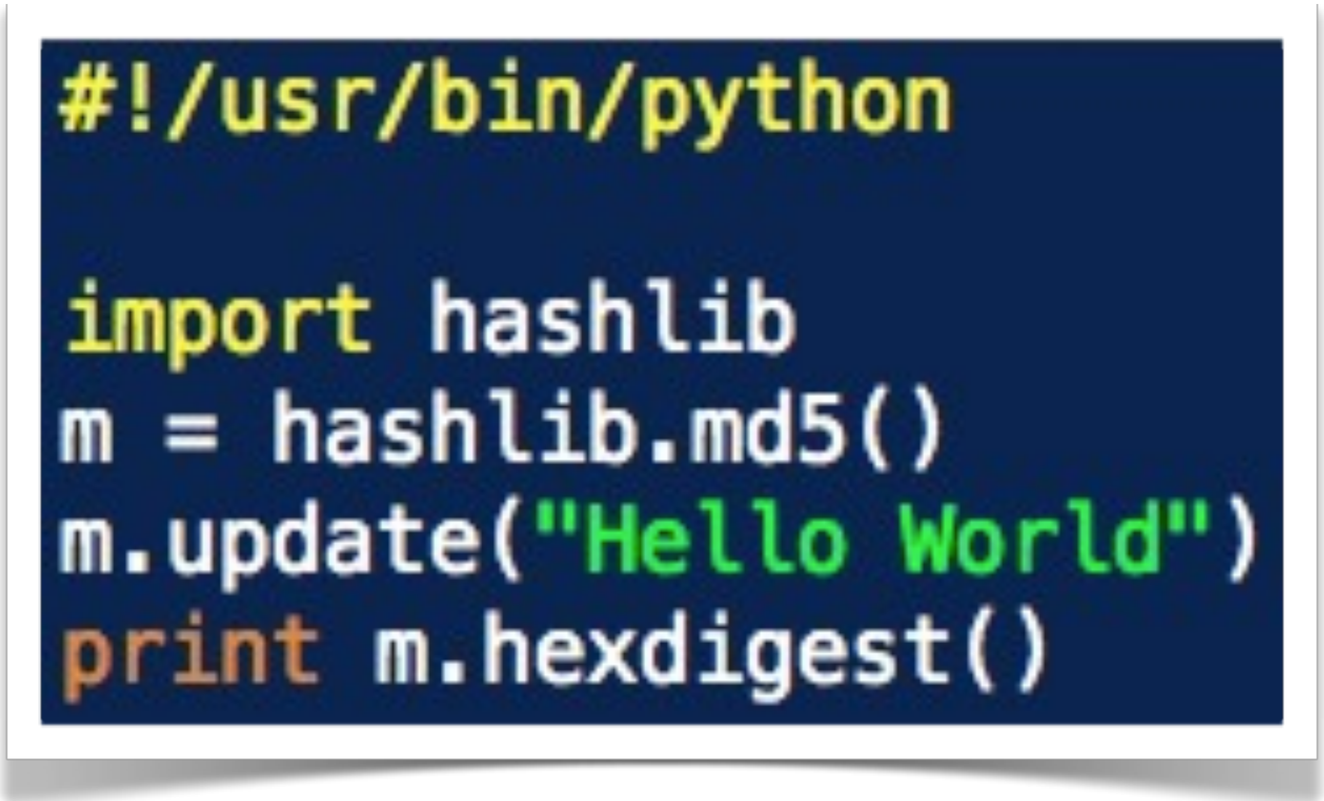
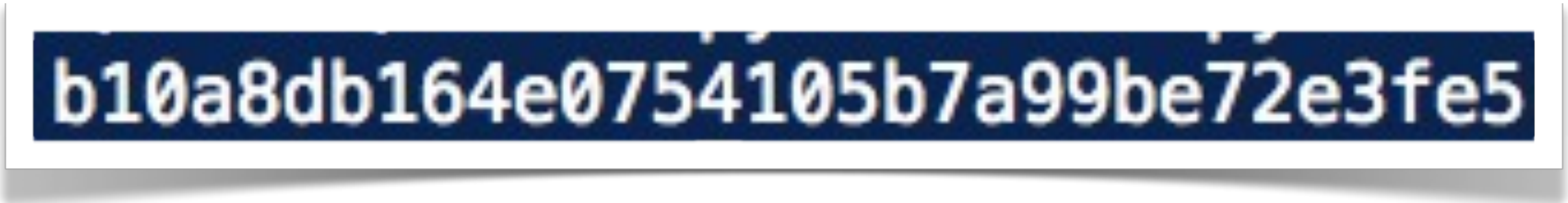
The MD5 function in Python



```
#!/usr/bin/python

import hashlib
m = hashlib.md5()
m.update("Hello World")
print m.hexdigest()
```



```
b10a8db164e0754105b7a99be72e3fe5
```

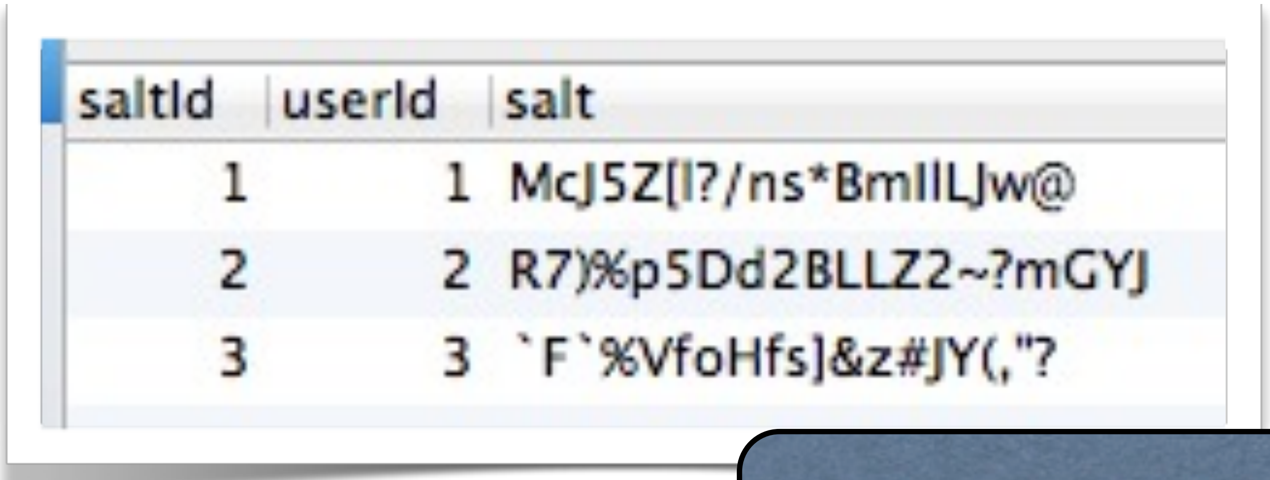
Salt

Salt is an extra random string that is added to the user's password before it is hashed.

It helps to prevent brute-force attacks on the hash.

Salt

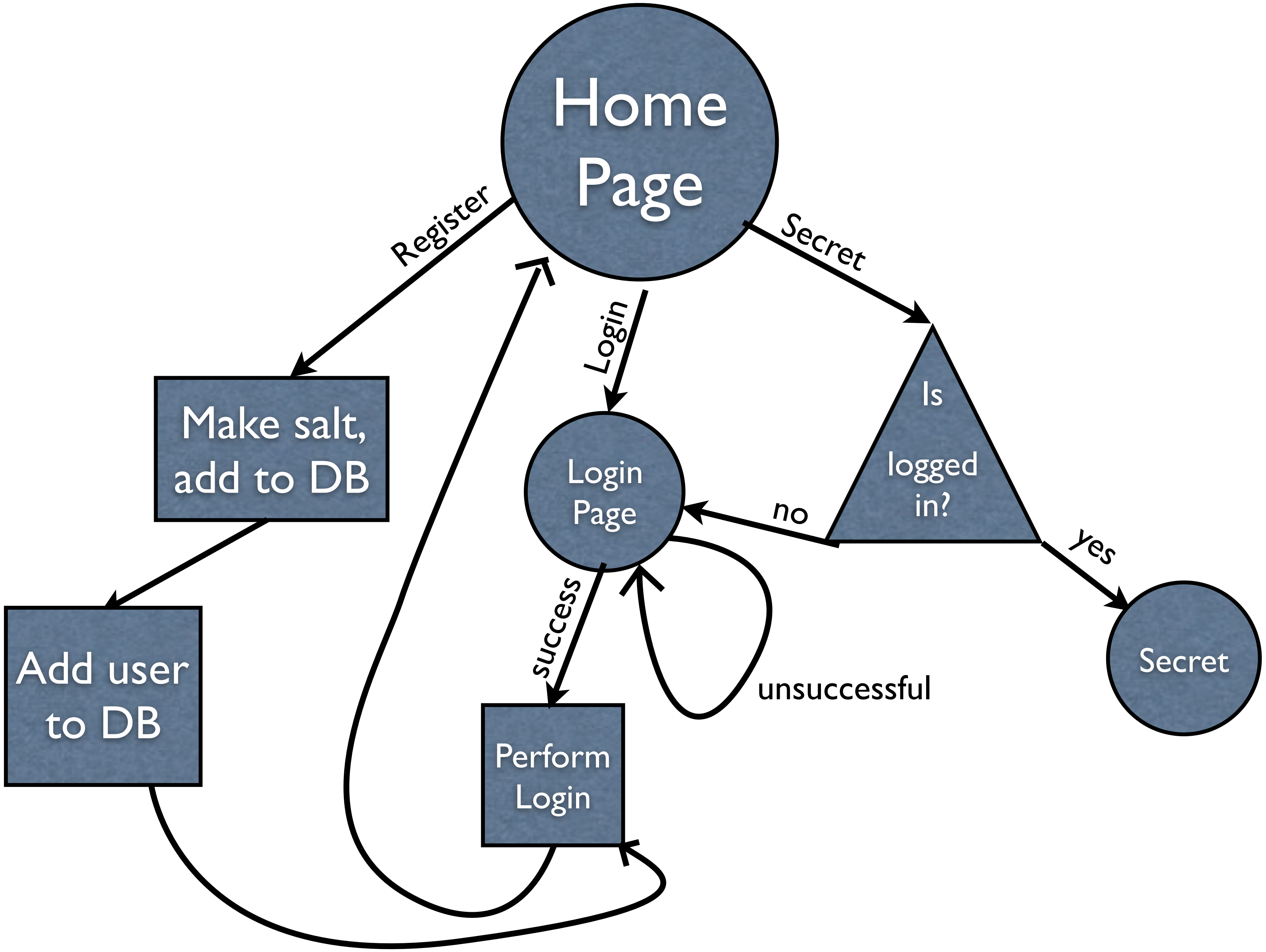
Each user has a secret salt generated during the creation of his user account.



saltId	userId	salt
1	1	McJ5Z[l?/ns*BmIlLJw@
2	2	R7)%p5Dd2BLLZ2~?mGYJ
3	3	`F`%VfoHfs]&z#JY(,"?

Random characters

Session Flow



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Lab 5

Incorporate registration, login, and sessions into your PHP website.

Make a screencast tour of your code.

Day 5