Perl DBI

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Recall, SQL

- SELECT: Find all the records that have a certain property
- INSERT: Add new records
- DELETE: Remove old records
- UPDATE: Modify records that are already there
SQL Examples

• SELECT firstname FROM people WHERE lastname = 'Smith'

• DELETE FROM people WHERE id = 3

• UPDATE people SET age = age+1 WHERE id = 247

• INSERT INTO people VALUES ('Euler', 'Leonhard', 248, NULL, 58, 'M')
What is a Database?

• A database is a structure for storing information

• Requires *libraries* to add and retrieve that information in programs like C or Perl

• Some libraries are lightweight (like Oracle), others will optimize the query and return something that looks more like an object.

• Some want you to flap your arms and bark like a chicken, others want you to stand on your head and drink out of your sneaker
DBI to the Rescue

- DBI stands for 'Database Interface'

- Doesn't actually talk to any database, but loads modules (DBD, or Database Driver) that have the vendor libraries

```
Your program  DBI  DBD::Oracle
             Library
                 Oracle

DBD::CSV

Text Files
```
Using DBI

Example Code
Multiple Prepares

• Use
  $dbh->prepare_cached(…)
  instead of
  $dbh->prepare(…)
  if you're going to be issuing many queries

• Don't ever use $dbh->prepare("...$value"), as prepare is very slow—call execute($value)
Prepare and '?'

• Don't call `prepare("…$value…")` because the user could put something malicious in the string.
Hi, this is your son's school. We're having some computer trouble.

Oh, dear - did he break something? In a way.

DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?

Oh, yes. Little Bobby Tables, we call him.

Well, we've lost this year's student records. I hope you're happy.

And I hope you've learned to sanitize your database inputs.
> show databases;
> use sequences_yourname;
> create table seqs (title varchar(20),
>     accession varchar(20), sequence varchar(20));
> select * from seqs;
> insert into seqs values('Human','u235','cgatcagt');
> delete from seqs;
> load data local infile
>     '/u/nclement/public_html/sample.txt' into table seqs;
> delete from seqs where accession='u235';
use DBI;
my $dbh = DBI->connect( "dbi:mysql:database=sequences;host=paintball;", "phylo",""
                            or die("Couldn't connect");
my $SQL= "select * from seqs";
my $select = $dbh->prepare($SQL);
$select->execute();
while(my $row=$select->fetchrow_hashref)
{
    print "$row->{title}, $row->{sequence} \n"
}
$dbh->disconnect();