

INSERT, UPDATE, DELETE

```
INSERT INTO table  
    (field1 , field2 )  
VALUES ("value1", "value2")
```

```
UPDATE table  
    SET field1 = "newvalue1",  
        field2 = "newvalue2"  
    WHERE pk_id = #
```

```
DELETE FROM table  
    WHERE pk_id = #
```

`use DBI;`

- DBI - **DataBase Interface**
- DBD - **DataBase Driver**
 - `DBD::mysql`, `DBD::Pg`
 - `DBD::Oracle`
 - `DBD::CSV`
 - `DBD::AnyData`
- Both simple and advanced “idioms” for database interaction

Get a **handle** on things:

```
#!/usr/bin/perl -w

use strict;
use DBI;

# get a database handle:
my $dbh = DBI->connect(
    "dbi:mysql:seqdb",
    "username", "password",
    { AutoCommit => 1,
      RaiseError => 1,
    }
) or die $DBI::errstr;
```

Anatomy of a DataSource Name (DSN)

```
"dbi:mysql:seqdb"
```

```
"dbi:Pg:seqdb"
```

```
"dbi:oracle:seqdb"
```

```
"dbi:mysql:database=seqdb"
```

```
"dbi:mysql:db=seqdb;host=bush1"
```

Do something!

```
$mw = 292;  
$dbh->do (<<EOSQL);
```

```
INSERT INTO protein  
        (pi , mw)  
VALUES (13.2, $mw)
```

EOSQL

```
$dbh->do (<<'EOSQL');
```

```
ALTER TABLE protein  
ADD COLUMN seq (text)
```

EOSQL

“All at once” **SELECT**

```
my @taxa =
    @{$dbh->selectall_arrayref(<<'EOSQL')};

    SELECT taxon_id, name
    FROM   taxon
    WHERE  name LIKE "Salmonella%"
    AND    rank = "species"

EOSQL

for my $taxa (@taxa) {
    my ($taxon_id, $name) = @$taxa;
    # ...
}
```

“One at a time” **SELECT**

```
my $sth = $dbh->prepare(<<'EOSQL');
```

```
    SELECT taxon_id, name  
    FROM   taxon  
    WHERE  name LIKE "Salmonella%"  
    AND    rank = "species"
```

EOSQL

```
$sth->execute();  
while (my $taxa =  
        $sth->fetchrow_arrayref) {  
    my ($taxon_id, $name) = @$taxa;  
    # ...  
}
```

Binding Variables to Columns

```
my $sth = $dbh->prepare(<<'EOSQL');

    SELECT taxon_id, name
    FROM   taxon
    WHERE  name LIKE "Salmonella%"
    AND   rank = "species"

EOSQL

$sth->execute();
my ($taxon_id, $name);
$sth->bind_columns(\ $taxon_id, \ $name);

while ($sth->fetch) {
    # ...
}
```


Placeholders “?”

```
my $sth = $dbh->prepare (<<'EOSQL' );
```

```
    SELECT taxon_id, name
    FROM   taxon
    WHERE  name LIKE ?
    AND   rank = "species"
```

```
EOSQL
```

```
$sth->execute ("Salmonella%");
while (my $taxa =
        $sth->fetchrow_arrayref) {
    my ($taxon_id, $name) = @$taxa;
    # ...
}
```

Placeholders “?”

```
my $sth = $dbh->prepare (<<'EOSQL' );
```

```
    SELECT taxon_id, name
    FROM    taxon
    WHERE   name LIKE ?
    AND    rank = ?
```

EOSQL

```
$sth->execute("Salmonella%", "species");
while (my $taxa =
        $sth->fetchrow_arrayref) {
    my ($taxon_id, $name) = @$taxa;
    # ...
}
```

Using Databases With Perl

Placeholders “?”

```
my $sth = $dbh->prepare (<<'EOSQL' );
```

```
UPDATE sp
SET descr      = ?,
    name       = ?,
    taxon_id   = ?
WHERE sp_acc  = ?
```

```
EOSQL
```

```
while (<>) {
    my ($descr, $name, $taxon_id, $sp_acc);
    # parse SwissProt (somehow)
    $sth->execute($descr, $name, $taxon_id,
                 $sp_acc);
}
```

Placeholders “?”

```
my $sth = $dbh->prepare (<<'EOSQL' );

    INSERT INTO sp
        (descr, name, taxon_id, sp_acc)
    VALUES (      ?,      ?,      ?,      ?)

EOSQL

while (<>) {
    my ($descr, $name, $taxon_id, $sp_acc);
    # parse SwissProt (somehow)
    $sth->execute($descr, $name, $taxon_id,
                 $sp_acc);
}
```

Getting “seqdb” for yourself:

<http://www.people.virginia.edu/~ajm6q/seqdb.sql.gz>

```
% mysql -e “create database seqdb”;
```

```
% zcat seqdb.sql.gz | mysql seqdb;
```