

## BIOL358 - Computer Skills for Biotechnology

Programming Languages & Perl



Computer Skills for Biotechnology · <http://www.bioinformaticsourses.com/BIOL358/> · Helge Weissig, 2005 (1)

---

---

---

---

---

---

---

---

## General Concepts

- Categories
  - Interpreted & Compiled
  - Object Oriented & Procedural
- Variables
- Data types and structures
- Operators
- Flow control
- Subroutines



Computer Skills for Biotechnology · <http://www.bioinformaticsourses.com/BIOL358/> · Helge Weissig, 2005 (2)

---

---

---

---

---

---

---

---

## Hello World (Java)

- Create helloWorld.java

```
import java.io.*;
class helloWorld {
    public static void main(String
    args[]) {
        System.out.print ("Hello
        World\n");    }
    }
```
- Compile helloWorld.java

```
javac helloWorld.java
```
- Run helloWorld

```
java helloWorld
```



Computer Skills for Biotechnology · <http://www.bioinformaticsourses.com/BIOL358/> · Helge Weissig, 2005 (3)

---

---

---

---

---

---

---

---

## Hello World (C/C++)

- ❑ Create helloWorld.c

```
#include <stdio.h>
int main(int argc, char **argv) {
    printf("Hello World\n");
    return 0;
}
```
- ❑ Compile helloWorld.c

```
cc -o helloWorld helloWorld.c
```
- ❑ Run helloWorld

```
./helloWorld
```



Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (4)

---

---

---

---

---

---

---

---

## Hello World (Perl)

- ❑ Create helloWorld.pl

```
#!/usr/local/bin/perl
print "Hello World\n";
```
- ❑ Run helloWorld.pl

```
chmod +x helloWorld.pl
./helloWorld.pl
```



Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (5)

---

---

---

---

---

---

---

---

## Getting perl

- ❑ UNIX/Linux: [www.perl.com](http://www.perl.com)
- ❑ Windows:  
[www.activestate.com/ActivePerl/](http://www.activestate.com/ActivePerl/)
- ❑ Mac: [www.macperl.com](http://www.macperl.com)



Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (6)

---

---

---

---

---

---

---

---

## Learning Perl



Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (7)



---

---

---

---

---

---

---

---

## Perl Documentation

- perldoc perldoc
- perldoc -h
- Examples:
  - perldoc CGI
  - perldoc -f open

Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (8)



---

---

---

---

---

---

---

---

## Programming Strategies

- Avoid programming
  - [www.shareware.com](http://www.shareware.com)
  - [www.google.com](http://www.google.com)
  - Medline/Libraries
- Don't change other people's code... too much!
- Reuse, Reuse, Reuse!
- Comment copiously
- There is more than one way to do it!

Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (9)



---

---

---

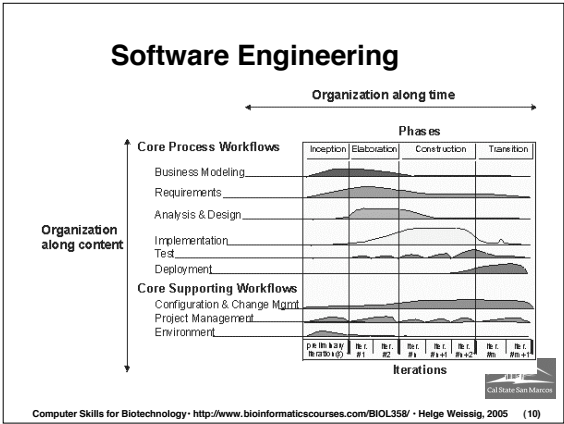
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

## Perl Poetry

```
#!/usr/local/bin/perl
# life.pl

open life; use Wisdom;
seek food, water, shelter;

for (<life>) { # means to
    eat() if /hungry/;
    drink() if /thirsty/;
    sleep ("just for a while") if /tired/;
    read books, $think, write $code, etc;
}

close life;
exit # quietly . . .
```

Cal State San Marcos

Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (11)

---

---

---

---

---

---

---

---

---

---

## Obfuscated Perl

```
#!/usr/local/bin/perl

undef $/; $<DATA>; y/ODA\n / /ds; @yoda = map { length } split; print chr
oct join("", splice(@yoda, 0, 3)) - 111 while @yoda;

__DATA__
0000000000000000 0000 DD00000000
0D00000000000000 000000 000000000000
0000 000 000 000 000 00D
0000 000 00D 000 D000000000
0000 0000 D0000000000000 00D D000000D0000
00000D000000 000 0000 00D0 00D 0000000D00
00000D000000 000 0000 00D0 00D 0000000D00

00000 00D 00000 0000 DD00000000 0000000000
00000 000D00 000D00 0000000000 0000000000
0000000D00000D00 000 0D0 DDD D00 0000D
000000000000000 000 D00 D00D000000 00D00
D0000 00000 000000000000 000 0000 00D00
000 000 00000D00000000 000 0D00000000000000
0 0 000D 0000 000 00000000000000
```

Cal State San Marcos

Computer Skills for Biotechnology · <http://www.bioinformaticscourses.com/BIOL358/> · Helge Weissig, 2005 (12)

---

---

---

---

---

---

---

---

---

---

### Exercises (BegPerl - Chapter 4)

1. Write a program that stores an integer in a variable and prints it out.
2. Write a program that prints out a string in lower case and upper case using `tr///`
3. Do the above using `\U` and `\L`
4. Write a program to reverse transcribe RNA to DNA
5. Read two files of data and print the contents of the first followed by the contents of the second.



Computer Skills for Biotechnology · <http://www.bioinformaticsourses.com/BIOL358/> · Helge Weissig, 2005 (13)

---

---

---

---

---

---

---

---