

CS306 – Introduction to Perl
Spring 2006
Homework Assignment #4
Due: Monday, March 13th, 2006 (12:20pm)

Please see the guidelines on homework #1 on how to submit your homework.

Homework #4

Question 1. (4 pts) What is the advantage of passing parameters to a function in the form of a hash? Give a complete function as an example of using this technique and demonstrating its advantages.

Question 2. (4 pts) What is the output of the following program? Explain how each line of output was calculated.

```
#!/usr/bin/perl

$num = 5;
doadd();
print "$num\n";

sub add {
    $_[0] ? $_[0]++ : $num++;
}

sub doadd {
    my $num = 3;
    add();
    print "$num\n";
    add($num);
    print "$num\n";
}
```

Question 3. (4 pts) What is \$_? Give 3 examples of operators or functions in Perl that will use \$_ and how they use it. Give a code sample that shows one function or operator putting output into \$_ and another one then using the output that was placed into \$_ as input.

Question 4. (4 pts) Give 2 examples of code that will cause 'use strict;' to halt execution of the program and report an error. Explain why each will cause an error under use strict. Now give 2 examples for 'use warnings;' and explain why.

Question 5. (4 pts) Write the English translations and give a sample string that will match for the each of the following patterns (I have used a fixed-width font to make blank spaces clear. If you have any questions about whether something is a space or not, ask me.):

- 5a. `/\w+ \w+, \d{3}/`
- 5b. `/Cruise Ships?/i`
- 5c. `/\w+ \$?\d+\.\d{2}/`
- 5d. `/[w.] + @ ([w+ \.]) + \. \w {2,4} /`

Question 6. (4 pts) Write patterns for the following sentences:

6a. One to three digits followed by a period followed by one to three digits followed by a period followed by one to three digits followed by a period followed by one to three digits.

6b. An optional opening parentheses followed by 3 digits followed by an optional closing parentheses followed by a space, hyphen or period, followed by 3 digits, followed by a space, hyphen or period, followed by 4 digits.

6c. One or more numbers followed by one or more words separated by spaces followed by the letters 'Street', 'Drive' or 'Avenue'.

6d. The letters 'http' followed by a colon and two forward slashes, the letters 'www' followed by a period followed by one or more word characters followed by a period followed by the letters 'com', 'net' or 'org' optionally followed by a forward slash. [Careful, there's a trick here!]

Question 7. (4 pts) Given the pattern `/\w+(.*)\d+/'` for each string below, indicate the contents of `$1` after the string is matched against this pattern.

7a. 'An army of 1'

7b. 'Fran is the instructor for CS306'

7c. 'All or nothing at all'

7d. 'I took 201 before 250.'

Question 8. (4 pts)

8a. Write a `split()` function call that splits a string on any whitespace or `l`.

8b. Write a `s///` call to strip all whitespace at the beginning of a line.

8c. Write a `s///` call to replace all instances of the word 'red' with the word 'blue' in some `$text`.

8d. What's one way to convert all uppercase characters in `$text` to lowercase without `lc()` or `\L?`

Program 1. (8 pts) Your task is to write a program that will parse a standard mail message that looks like:

```
From fran@localhost.localdomain Mon Feb 27 10:20:27 2006
Return-Path: <fran@localhost.localdomain>
Received: from localhost.localdomain (franlt [127.0.0.1])
    by localhost.localdomain (8.13.4/8.13.4) with ESMTTP id k1RGKQIH004747
    for <fran@localhost.localdomain>; Mon, 27 Feb 2006 10:20:27 -0600
Received: (from fran@localhost)
    by localhost.localdomain (8.13.4/8.13.4/Submit) id k1RGKQTE004746
    for fran; Mon, 27 Feb 2006 10:20:26 -0600
Date: Mon, 27 Feb 2006 10:20:26 -0600
From: Fran Fabrizio <fran@localhost.localdomain>
Message-Id: <200602271620.k1RGKQTE004746@localhost.localdomain>
To: fran@localhost.localdomain
Subject: Test message
```

Sample email for homework 4.

You should construct and output a hash with the following structure:

```
$VAR1 = {
    'from_email' => 'fran@localhost.localdomain',
```

```
'subject' => 'Test message',  
'from' => 'Fran Fabrizio ',  
'date_sent' => 'Mon, 27 Feb 2006',  
'time_sent' => '10:20:26 -0600',  
'hops' => 2  
};
```

Hops should be incremented once for each “Received:” line that you encounter.