

Week 07 Weekly Test Sample Answers

Test Conditions

These questions must be completed under self-administered exam-like conditions. You must time the test yourself and ensure you comply with the conditions below.

- You may complete this test in CSE labs or elsewhere using your own machine.
- You may complete this test at any time before **Thursday 23 July 21:00**.
- Weekly tests are designed to act like a past paper - to give you an idea of how well you are progressing in the course, and what you need to work on. Many of the questions in weekly tests are from past final exams.
- Once the first hour has finished, you must submit all questions you've worked on.
- You should then take note of how far you got, which parts you didn't understand.
- You may choose then to keep working and submit test question anytime up to Thursday 23 July 21:00
- However the maximum mark for any question you submit after the first hour will be 50%

You may access this **language documentation** while attempting this test:

- [Shell/Regex/Perl quick reference](#)
- [full Perl documentation](#)

You may also access manual entries (the `man` command).

Any violation of the test conditions will result in a mark of zero for the entire weekly test component.

Set up for the test by creating a new directory called `test07`, changing to this directory, and fetching the provided code by running these commands:

```
$ mkdir test07
$ cd test07
$ 2041 fetch test07
```

Or, if you're not working on CSE, you can download the provided code as a [zip file](#) or a [tar file](#).

WEEKLY TEST QUESTION:

Echo If Consecutive Three Vowels

Write a Perl program **three_vowel_echo.pl** that prints its command-line argument to standard output, similar to **echo** command in Shell, except arguments should be printed only if they contain 3 consecutive vowels.

Your program can assume vowels are there are 5 vowel {'a', 'e', 'i', 'o', 'u'} and their upper-case equivalents {'A', 'E', 'I', 'O', 'U'}

Your answer must be Perl only. You can not use other languages such as Shell, Python or C.

You may not run external programs, e.g. via `system` or backquotes.

```
$ ./three_vowel_echo.pl Pompeii Rome Aeolian Florence
Pompeii Aeolian
$ ./three_vowel_echo.pl

$ ./three_vowel_echo.pl an anxious bedouin beauty booed an ancient zoologist
anxious bedouin beauty booed
$ ./three_vowel_echo.pl abstemiously adenocarcinomatous Hawaiian Eoanthropus
abstemiously Hawaiian Eoanthropus
```

When you think your program is working you can autotest to run some simple automated tests:

```
$ 2041 autotest three_vowel_echo
```

When you are finished working on this exercise you must submit your work by running **give**:

```
$ give cs2041 test07_three_vowel_echo three_vowel_echo.pl
```

Sample solution for `three_vowel_echo.pl`

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

# print command line arguments which contain 3 consecutive vowels
# written by andrewt@unsw.edu.au as COMP[29]041 sample solution

my $n_printed = 0;
foreach $argument (@ARGV) {
    if ($argument =~ /[aeiou][aeiou][aeiou]/i) {
        print " " if $n_printed++;
        print $argument;
    }
}
print "\n";
```

Alternative solution for three_vowel_echo.pl

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

# print command line arguments which contain 3 consecutive vowels
# written by andrewt@unsw.edu.au as COMP[29]041 sample solution
# more concise less readable version

print join(" ", grep(/[aeiou][aeiou][aeiou]/i, @ARGV)), "\n"
```

WEEKLY TEST QUESTION:

Print the Middle Lines of A File

Write a Perl program `middle_lines.pl` which prints the middle line(s) in a file.

If the file contains an odd number of lines it should print one line.

If the file contains an even number of lines it should print two lines.

If the file contains no lines it should print nothing.

You can assume one and only one file is given as argument and that it exists and it is readable.

For example:

```
$ cat odd.txt
line 0
line 1
line 2
line 3
line 4
$ ./middle_lines.pl odd.txt
line 2
$ cat even.txt
line 0
line 1
line 2
line 3
line 4
line 5
$ ./middle_lines.pl even.txt
line 2
line 3
$ ./middle_lines.pl /dev/null
```

Your answer must be Perl only. You can not use other languages such as Shell, Python or C.

You may not run external programs, e.g. via `system` or backquotes.

When you think your program is working you can autotest to run some simple automated tests:

```
$ 2041 autotest middle_lines
```

When you are finished working on this exercise you must submit your work by running **give**:

```
$ give cs2041 test07_middle_lines middle_lines.pl
```

Sample solution for `middle_lines.pl`

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

# print middle lines of a file
# written by andrewt@unsw.edu.au as COMP[29]041 sample solution

open F, '<', $ARGV[0] or die;
my @lines = <F>;
close F;

if (!@lines) {
    # no lines
} elsif (@lines % 2 == 1) {
    # odd number of lines
    print $lines[$#lines/2];
} else {
    # even number of lines
    print $lines[$#lines/2];
    print $lines[$#lines/2 + 1];
}
```

Alternative solution for middle_lines.pl

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

# print middle lines of a file
# written by andrewt@unsw.edu.au as COMP[29]041 sample solution
# more concise less readable version

my @lines = <>;
print @lines[(@lines-1)/2..((@lines-1)/2 + 1 - (@lines%2))] if @lines;
```

WEEKLY TEST QUESTION:

Print the Line(s) from Stdin With the Largest Number

Write a Perl program **largest_numbered_line.pl** that read lines from standardinput until end-of-input. It should then print the line(s) which contained the largest number.

You can assume numbers do not contain white space, commas or other extra characters.

You can assume numbers are only in decimal format.

You can assume numbers are not in scientific/exponential format.

Lines may contain multiple numbers and they may contain any number of any character between the numbers.

If the largest number occurs on multiple lines you should print all of the lines in the order they occurred.

If no line contains a number, your program should print nothing.

```
$ ./largest_numbered_line.pl
I spent $ 15.50 for
3.3 kg apples yesterday.
2000 is a leap year.
Ctrl-D
2000 is a leap year.
```

```
$ ./largest_numbered_line.pl
two2 four4 eight8 sixteen16
1 sixteen-and-half 16.5 1
11 12 13
Ctrl-D
1 sixteen-and-half 16.5 1
```

```
$ ./largest_numbered_line.pl
the quick brown f42ox
4 9 42 2 4
1 2 3 4 42.0
no forty two
last 42
Ctrl-D
the quick brown f42ox
4 9 42 2 4
1 2 3 4 42.0
last 42
```

```
$ ./largest_numbered_line.pl
a 0.01
b .5
c -0.9
Ctrl-D
b .5
```

```
$ ./largest_numbered_line.pl
a -.5
b -5
c --90--
Ctrl-D
a -.5
```

```
$ ./largest_numbered_line.pl
I love programming in Perl
but I like Python better.
Ctrl-D
```

Your answer must be Perl only. You can not use other languages such as Shell, Python or C.

You may not run external programs, e.g. via system or backquotes.

When you think your program is working you can autotest to run some simple automated tests:

```
$ 2041 autotest largest_numbered_line
```

When you are finished working on this exercise you must submit your work by running **give**:

```
$ give cs2041 test07_largest_numbered_line largest_numbered_line.pl
```

Sample solution for largest_numbered_line.pl

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

# print line of a file containing largest number
# written by andrewt@unsw.edu.au as COMP[29]041 sample solution

while ($line = <STDIN>) {
    my @line_numbers = $line =~ /\-?(?:\d+\.\d*|\.\d+)/g;
    if (@line_numbers) {
        my $largest_line_number = (sort {$b <=> $a} @line_numbers)[0];
        push @numbers, $largest_line_number;
        push @lines, $line;
    }
}

if (@numbers) {
    my $largest_number = (sort {$b <=> $a} @numbers)[0];
    foreach $i (0..$#numbers) {
        if ($numbers[$i] == $largest_number) {
            print $lines[$i];
        }
    }
}
```

Alternative solution for largest_numbered_line.pl

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

# print line of a file containing largest number
# written by andrewt@unsw.edu.au as COMP[29]041 sample solution
# more concise less readable version

push @numbers, /\-?(?:\d+\.\d*|\.\d+)/g foreach @lines = <STDIN>;
exit if !@numbers;
$largest = (sort {$b <=> $a} @numbers)[0];
(sort {$b <=> $a} /\-?(?:\d+\.\d*|\.\d+)/g)[0] == $largest && print foreach @lines;
```

Submission

When you are finished each exercise make sure you submit your work by running **give**.

You can run **give** multiple times. Only your last submission will be marked.

Don't submit any exercises you haven't attempted.

If you are working at home, you may find it more convenient to upload your work via [give's web interface](#).

Remember you have until **Thursday 23 July 21:00** to complete this test.

Automarking will be run by the lecturer several days after the submission deadline for the test, using test cases that you haven't seen: different to the test cases `autotest` runs for you.

(Hint: do your own testing as well as running `autotest`)

Test Marks

After automarking is run by the lecturer you can [view it here](#) the resulting mark will also be available via [via give's web interface](#) or by running this command on a CSE machine:

```
$ 2041 classrun -sturec
```

The test exercises for each week are worth in total 1 marks.

The best 6 of your 8 test marks for weeks 3-10 will be summed to give you a mark out of 9.

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