Homework #0: CMPT-825

Not for credit: do not hand in

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(1) Perl programming warm-up exercises: For this question, use the text file called hw0.txt as the input to each of the sub-parts to this question. This location of this file is given on the course web page (look under the *Assignments* section). Each program should be run from the command line as follows:

```
% perl your-program.pl hw0.txt \langle cr \rangle
```

Here is an example perl program to count the number of words in a file:

```
use strict;
my $line;
my $total = 0;
while ($line = <>) {
   chomp($line);
   my @words = split(' ', $line);
   next if ($#words < 0);
   $total += $#words +1;
}
print "$total\n";</pre>
```

Save this as a file wc.pl and run perl wc.pl hw0.txt. Compare your output with the standard Unix command wc which also reports the number of words.

- a. Modify the above program to report the number of lines in addition to the number of words. Run it on hw0.txt. You should get 20 lines.
- b. Write a Perl program to read in the text file and print each line to standard output with the line number of each line as a prefix. The line numbers should start from 1. e.g. it would take each line of text from the input:

```
some text here
some more text here
```

and print each line with it's line number:

```
1 some text here
2 some more text here
```

Also print out the number of lines to STDERR. e.g. if the file had 20 lines then print to STDERR: number of lines=20

- c. Extend the program for Q.1b to print only the odd-numbered lines.
- d. Write a Perl program that takes the text file and strips away any initial positive integer followed by a space if it exists, e.g. it would take a line of text:

```
1 some text here
2 some more text here
and print
```

```
some text here
some more text here
```

e. Write a Perl program to randomly shuffle the lines in the text file. Use the following function fisher_yates_shuffle which randomly shuffles an array in place:

```
sub fisher_yates_shuffle {
    my ($array) = @_;
    for (my $i = @$array; --$i; ) {
        my $j = int(rand($i+1));
        next if ($i == $j);
        @$array[$i,$j] = @$array[$j,$i];
        # note that: @$array[$j,$i] equals ($array[$j],$array[$i])
    }
}
```

To use the above function, you have to pass it a reference to an array which is then shuffled in place. e.g.

```
@x = (1,23,34,22,342,11,23);
fisher_yates_shuffle(\@x);
print "@x\n";
```

This produces the result:

```
11 1 34 23 342 22 23
```

- f. Use the function fisher_yates_shuffle, but this time use it in a Perl program to randomly shuffle the words in each input line. Each line of text should appear in the same order as the input but the words in each line should be randomly permuted.
- g. Write a Perl program to eliminate duplicate lines from the input file. Provide the number of lines that remain after all duplicate lines are eliminated from hw0.txt. You should get 10 unique lines.