William Hill Web Developer Assessment

There are four questions in this assignment. Using either PHP or JavaScript. Provide answers to as many of the questions as you can.

Provide the source code for each answer in a folder corresponding to the question (i.e. Q1, Q2, Q3 and Q4).

You may include a file named README.txt containing your notes on the programs (for example, the design decisions you made, potential improvements you would make if given more time).

Package all question folders (and the optional README.txt) into a zip file using your name as the file name (e.g. JoeSmith.zip). Submit this zip via your recruiter.

PHP

For PHP submissions, each question folder should contain a file called `answer.php`. This file should accept a single command-line argument, which is a path to a plain text file containing the program input. The program should output answers to standard output.

If you use any third party libraries in your PHP solution, they should be packaged along with the source code such that your code will run on a clean installation of PHP 5.3.

Your code will be run on the command line e.g. `php -f q1/answer.php input.txt`

JavaScript

For JavaScript submissions, each question folder should contain a file called `answer.js`. This file should accept a single command-line argument, which is a path to a plain text file containing the program input. The program should output answers to standard output.

If you use any third party libraries in your JavaScript solution, they should be packaged using a `package.json` such that executing `npm install` will install the libraries locally.

Your code will be executed through node.js v0.10.21, e.g. `node q1/answer.js input.txt`

Q1

Write a program that, when given a list of words separated by spaces, outputs the words in reverse order.

The input may contain multiple lines, consider each line of the input to be a separate set of words, and output each set of words on a new line.

Example input:

Welcome to William Hill

Enjoy the test

Example output:

Hill William to Welcome

test the Enjoy

Q2

In the UK there are coins with the following denominations:

1p, 2p, 5p, 10p, 20p, 50p, £1 (100p), £2 (200p)

We can make 3p using the following two distinct combinations:

1p + 1p + 1p

1p + 2p

Write a program that, when given an input Xp, outputs the number of distinct ways Xp can be produced using UK coins. You may expect the input to contain a single number for X on each line. Each type of coin may be used an arbitrary number of times.

Example input:

3

1

Example output:

2

1

Q3

Write a program that, when given two months, outputs the number of months in between that contain five Sundays.

This is inclusive, for example given an input of “September 2013 December 2013”, your program should consider September, October, November and December 2013.

The dates will be provided as two pairs of months and years separated by spaces, per line, and the input may contain multiple lines.

Example input:

September 2013 December 2013

Example output:

2

Q4

Given two integers x and y, we can calculate all combinations of x and y when given an upper and lower bound for their values. For example, using 2 and 4 as the lower and upper bounds for x and y gives us the following pairs of x and y: {2,2} {2,3} {2,4} {3,2} {3,3} {3,4} {4,2} {4,3} {4,4} .

For each of these pairs, we can calculate x^y.

$2^2 = 4, 2^3 = 8, 2^4 = 16, 3^2 = 9, 3^3 = 27,\ 3^4 = 81, 4^2 = 16, 4^3 = 64, 4^4 = 1024$

Removing duplicate values, we get:

4, 8, 9, 16, 27, 64, 81, 1024

This is 8 distinct terms.

Write a program that, when given two integer bounds as input, outputs the number of distinct values of x^y.

You may expect each pair of bounds on a single line, separated by a space. The input may contain multiple lines.

Example input:

2 4

Example output

8