COMP2212 Programming Language Concepts Coursework Submission 2

Deadline: Thursday April 28 4pm

Additional Problems

Problem 6 - Copying + Prefix

Take a sequence $a_1\ a_2\ a_3\ a_4\ a_5\ \ldots$ as an input and output two copies of it, the second prefixed with 0.

Example input:	Expected output:
-5	$-5\ \ 0$
0	$0\ \ -5$
3	$3\ \ 0$

Problem 7 - Copying + Stream Arithmetic

Take two sequences $a_1\ a_2\ a_3\ a_4\ \ldots$ and $b_1\ b_2\ b_3\ b_4\ \ldots$, and produce two sequences

$$a_1 - b_1\ a_2 - b_2\ a_3 - b_3\ a_4 - b_4\ \ldots$$

$$a_1\ a_2\ a_3\ a_4\ \ldots$$

.

Example input:	Expected output:
$1\ \ 3$	$-2\ \ 1$
$2\ \ 2$	$0\ \ 2$
$3\ \ 1$	$2\ \ 3$

Problem 8 - Copying + Prefix + Stream Arithmetic

Take a sequence $a_1\ a_2\ a_3\ a_4\ a_5\ \ldots$ as an input and output

$$a_1 + 0\ a_2 + a_1\ a_3 + a_2\ a_4 + a_3\ a_5 + a_4\ \ldots$$

Example input:	Expected output:
1	1
2	3
3	5
4	7

Problem 9 - Natural Numbers

Take a sequence $a_1\ a_2\ a_3\ a_4\ a_5\ \ldots$ as an input and output

$$a_1\ 2a_1 + a_2\ 3a_1 + 2a_2 + a_3\ 4a_1 + 3a_2 + 2a_3 + a_4\ 5a_1 + 4a_2 + 3a_3 + 2a_4 + a_5\ \ldots$$

Example input:	Expected output:
1	1
0	2
0	3
0	4

Problem 10 - Delayed Feedback

Take a sequence $a_1\ a_2\ a_3\ a_4\ a_5\ a_6 \ldots$ as an input and output

$$a_1\ a_2\ a_3 + a_1\ a_4 + a_2\ a_5 + a_3 + a_1\ a_6 + a_4 + a_2 \ldots$$

that is, the first two outputs are the same as the first two inputs. Then, to produce the output at time $n > 2$, the current input a_n is added to the value which was *previously output* at time $n - 2$.

Example input:	Expected output:
1	1
2	2
3	4
4	6
5	9

Submission instructions

You are required to submit two separate files.

First, you need to submit a zip file containing programs (`pr6.spl`, `pr7.spl`, `pr8.spl`, `pr9.spl`, `pr10.spl`) written in your language that solve the problems described above. We will run our tests on your solutions and award marks for solving these additional problems correctly. This will form 50% of the total coursework mark (10% each for the five problems). You have the option of resubmitting the code for your interpreter together with a makefile (see instructions for submission 1) for a 50% penalty on this component. Thus, if you decide to resubmit your interpreter in the this second submission the maximum possible total coursework mark is capped at 75%.

Second, you are required to submit a 3 page user manual for your language in pdf format that explains the syntax, and describes any additional features (programmer convenience, type checking, informative error messages, etc.) If there are any technical features that you would like to highlight in more detail, you can do so in clearly marked appendices. There are no limits on the number of appendices and page numbers.

This report, together with the five programs will be evaluated qualitatively and your marks will be awarded for the elegance and flexibility of your solution and the clarity of the user manual. These qualitative aspects will be worth 30% of the total coursework mark.

As part of the second submission we require a declaration of how marks are to be distributed amongst the members of your group (e.g. 50-50, 40-60, etc). You will receive all feedback and your marks by Thursday May 19.