

Assignment 4

This assignment is worth 4 marks. Each question is worth 1 mark. Deadline
03 May EOD.

General guidelines

You may assume that the input provided is a valid input. For example, if the procedure expects two positive integers as input, you can assume that the input is always given in the correct form. Upload a single .pl file containing all the solutions.

These questions do not require more than 5-10 lines per question.

1. Write a rule `[is_valid_sum(S)]` in prolog such that given a sum S , it should be able to true/false depending on whether S is a sum of first i integers. For example, `is_valid_sum(10)` should return only one answer as true and `is_valid_sum(9)` should return only one answer as false.
2. Write a program `shuffle_list(X,Y)`, If we have a list X of size $3n(n \geq 0)$, Y is a simple shuffle of X .

`shuffle_list([1,2,3,4,5,6,7,8,9],Y)` would return

$Y = [2, 3, 1, 5, 6, 4, 8, 9, 7]$.

Here

1,2,3 shuffled as 2,3,1

4,5,6 shuffled as 5,6,4

7,8,9, shuffled as 8,9,7

3. Write a prolog rule to compute the n th term of Lucas sequence (similar to Fibonacci sequence) and its inverse.
`lucas(5,X)` should return 5th Lucas number which is 7. `lucas(X,18)` should return 7, as 18 is the 7th Lucas number.
4. Write a procedure (named `solution`) to figure out which of the following claim(s) is(are) true.

- (a) All of the below.
- (b) None of the below.
- (c) At least one of the above.
- (d) At least one of the below.
- (e) None of the first three options.
- (f) None of the above.