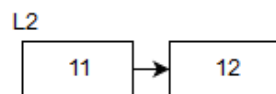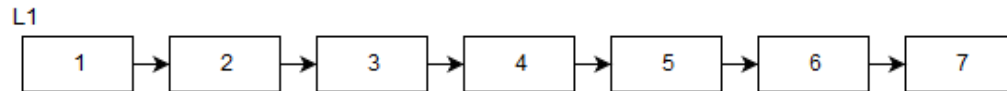# COP3530

Programming Assignment #2

Problem 1: Linked List Interleave Operation

In this assignment you have to implement a linked list data structure and perform a number of interleave operations on the lists.

Interleave Operation: Consider L1 and L2 to be two lists. Interleaving L2 into L1 with step equal to n means putting the elements of L2 in between the elements of L1, in a way that there are n elements from L1 between each two elements of L2 in the resulting list. In the following example, you can L2 being interleaved into L1 with different step values:

L1

| 1 | → | 2 | → | 3 | → | 4 | → | 5 | → | 6 | → | 7 |

L2

| 11 | → | 12 |

L2 interleaved into L1 with step = 1

| 1 | → | 11 | → | 2 | → | 12 | → | 3 | → | 4 | → | 5 | → | 6 | → | 7 |

L2 interleaved into L1 with step = 2

| 1 | → | 2 | → | 11 | → | 3 | → | 4 | → | 12 | → | 5 | → | 6 | → | 7 |

L2 interleaved into L1 with step = 3

| 1 | → | 2 | → | 3 | → | 11 | → | 4 | → | 5 | → | 6 | → | 12 | → | 7 |

For this problem, first you have to read the initial list, then, a number of lists will follow which you should interleave in the initial list with the given steps.

INPUT:

On the first line, you can read the number of elements in the initial list, N.
On the second line, you can read N numbers separated by spaces, which are the elements of the initial list.
On the third line, you can read the number of lists that you have to read and interleave into the initial list.
On the following $3*M$ lines, you can read the information about each of the M lists as follows: on each first line, a number, S, which shows the step value for the operation; on each second line, a number, K, which shows the number of elements in the list; and on each third line, K numbers separated by spaces which are the elements in the list.

OUTPUT:

Your program should output the final list, after all of the interleave operations, printed in one line with numbers separated by spaces.

Sample 1:

Input:

5	*N*, number of elements in the initial list
1 2 3 4 5	the elements in the initial list
1	number of additional lists
1	step \
2	number of elements => Additional list #1
11 12	the elements /

Output:
```
1 11 2 12 3 4 5
```

Sample 2:

Input:

5	
1 2 3 4 5	
2	number of additional lists
1	step \
2	number of elements => Additional list #1
11 12	the elements /
3	step \
2	number of elements => Additional list #2
21 22	the elements /

Output:
```
1 11 2 21 12 3 4 22 5
```

Sample 3:

Input:
```
3
1 2 3
5
1
2
1 2
2
2
1 2
3
2
1 2
4
2
1 2
5
2
1 2
```

Output:
```
1 1 1 1 1 1 2 2 2 2 2 2 3
```

Notes

- Make sure your code follows the input and output format, as described above. Don't print any prompts, e.g. "Please enter a number:".
- Step is always bigger than 0.
- The length of the lists will always be in a way that the second list would fit in the first list when doing the interleave operation, i.e. there won't be any leftover elements in L2.
- As you can see from the examples, when there are multiple interleave operations, each operation is done on the list resulting from the previous operation.
- **If you have any questions, use the discussion section.**