GOBACK-N ARQ

Assume that you are going to implement a part of GO BACK N ARQ FLOW control algorithm. Here are the terms used in algorithm.

- S_f: First frame sent out in the pipeline for whick acknowledgement is not yet received
- S_n : Next frame to be sent
- m: length of the sequence number
- S_w : Window size (2^m)-1

Sf and Sn changes on any one of the following 3 possible events in Go back N ARQ

- Timeout (E1)
- Frames from Upper layer(E2)
- ACK from bottom layer (E3)

Given m Sf Sn E1 E2 E3 as input, you need to find out the value of Sf and Sn for every test case.

Input Format

n m Sf Sn E1 E2 E3 (one line for each test case) n represents number of test cases

Constraints

M, Sf and Sn >0

E1 can be either 0 (if no timeout) or 1 if there is a timeout

E2 is the number of packets arrived from upper layer

E3 is either 0 or acknowledgement number

At a time any one of these 3 events can happen

Output Format

Sf Sn

Sample Input

4

3 1 4 0 3 0

4 1 9 0 0 6

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2 1 3 1 0 0

5 1 11 0 50 0
```

Sample Output

```
1 7

6 9

1 3

1 32
```

SELECTIVE REPEAT ARQ

Assume that you need to implement SELECTIVE REPEAT ARQ FLOW control algorithm. Here are the terms used in algorithm.

- S_f: First frame sent out in the pipeline for which acknowledgement is not yet received
- S_n: Next frame to be sent
- m: length of the sequence number
- S_w: Window size (2^m-1)

Sf and Sn changes on any one of the following 3 possible events in SELECTIVE REPEAT ARQ

1. Timeout (E1)

2. Frames from from Upper layer(E2)

3. ACK OR NAK from bottom layer (E3)

Given m Sf Sn E1 E2 E3 as input, you need to find out the value of Sf and Sn for every test case.

Input Format

n m Sf Sn E1 E2 E3 (one line for each test case) n represents number of test cases

Constraints

m, Sf and Sn >0.

E1 can be either 0 (if no timeout) or 1 if there is a timeout

E2 is the number of packets arrived from upper layer

E3 is either 0 or acknowledgement number or negative acknowledgement number

At a time any one of these 3 events can happen

Output Format

Sf Sn

Sample Input

4

4 1 4 0 3 0

5 1 9 0 0 6

3 2 3 2 0 0

5 1 11 0 0 -5

Sample Output

1 7

6 9

2 3

5 11