

# Assessment Two

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## 1

### 1.1

	A	B	C	D	E	F	G	H	I	J
c1	3	-2	0	0	0	0	0	0	0	0
c2	4	0	-1	0	0	0	0	0	0	0
c3	0	4	0	-3	0	0	0	0	0	0
c4	0	0	1	-2	0	0	0	0	0	0
c5	-2	0	0	1	0	0	0	0	0	0
c6	0	0	1	0	-1	0	0	0	0	0
c7	2	0	0	0	0	-4	0	0	0	0
c8	0	0	0	0	1	0	-2	0	0	0
c9	0	0	0	0	0	8	-2	0	0	0
c10	0	0	0	6	0	0	0	-2	0	0
c11	0	0	0	0	0	0	0	1	-3	0
c12	0	0	0	0	0	0	1	0	0	-1
c13	0	0	0	0	0	0	0	0	1	-1
c14	0	0	0	0	2	0	0	0	-X	0

In order to find the consumption rate  $X$  of actor  $I$  over channel  $c14$  we need to determine the PASS (Periodic Admissible Sequential Schedule).

$$\begin{matrix} & A & B & \dots & J \\ \begin{matrix} c1 \\ c2 \\ \vdots \\ c14 \end{matrix} & \begin{pmatrix} 3 & -2 & \dots & 0 \\ 4 & 0 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & 0 \end{pmatrix} & \begin{pmatrix} a \\ b \\ \vdots \\ j \end{pmatrix} & = 0 \end{matrix}$$

Which gives

$$3a = 2b, 4a = c, 4b = 3d, c = 2d, d = 2a, c = e, 2a = 4f, e = 2g, 8f = 2g,$$

$$6d = 2g, h = 3i, g = j, i = j, 2e = Xi$$

And therefore

$$12a = 8b = 3c = 6d = 3e = 24f = 6g = 2h = 6i = 6j$$

And  $X = 4$  We can get values for  $a..j$  by finding the least common integer denominator.

$$a = 2, b = 3, c = 8, d = 4, e = 8, f = 1, g = 4, h = 12, i = 4, j = 4$$

## 1.2

The sequence can be found by summing the number of tokens displaced for each edge.

	A	C	A	B	C	F	E	D	B	C	C	E	H	H	D	H	G	H	E	E	G	I	H
c1	0	3	3	6	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
c2	0	4	3	7	7	6	6	6	6	5	4	4	4	4	4	4	4	4	4	4	4	4	4
c3	0	0	0	0	4	4	4	4	1	5	5	5	5	5	2	2	2	2	2	2	2	2	2
c4	0	0	1	1	1	2	2	2	0	0	1	2	2	2	2	0	0	0	0	0	0	0	0
c5	4	2	2	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
c6	0	0	1	1	1	2	2	1	1	1	2	3	2	2	2	2	2	2	2	1	0	0	0
c7	0	2	2	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c8	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	2	2	0	0	1	2	0	0
c9	0	0	0	0	0	0	8	8	8	8	8	8	8	8	8	8	6	6	6	6	6	4	4
c10	0	0	0	0	0	0	0	0	6	6	6	6	6	4	2	8	6	6	4	2	2	2	2
c11	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	3	4	5	5	5	2
c12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2
c13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
c14	0	0	0	0	0	0	0	2	2	2	2	2	4	4	4	4	4	4	4	6	8	8	4

	B	C	E	I	C	D	J	J	H	H	H	E	C	I	C	E	D	E	G	H	H	H	I	J	G	J
c1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c2	4	3	3	3	2	2	2	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
c3	6	6	6	6	6	3	3	3	3	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0	
c4	0	1	1	1	2	0	0	0	0	0	0	0	1	1	2	2	0	0	0	0	0	0	0	0	0	
c5	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	
c6	0	1	0	0	1	1	1	1	1	1	1	0	1	1	2	1	1	0	0	0	0	0	0	0	0	
c7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
c8	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	4	2	2	2	2	2	2	0	
c9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2	0	
c10	0	0	0	0	0	6	6	6	4	2	0	0	0	0	0	0	6	6	6	4	2	0	0	0	0	
c11	3	3	3	0	0	0	0	0	1	2	3	3	3	0	0	0	0	0	0	1	2	3	0	0	0	
c12	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	
c13	1	1	1	2	2	2	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	1	0	
c14	4	4	6	2	2	2	2	2	2	2	2	2	4	4	0	0	2	2	4	4	4	4	0	0	0	