6.

$$A=\begin{pmatrix}0&1&0\\1&0&1\\0&1&0\end{pmatrix}\quad A^{1001}=(a_{ij}^{(1001)})_{3\times3} \text{ 中的 } \underline{a_{22}^{(1001)}} = 0$$

稍微算几个．找规律．

$$A\cdot A=\begin{pmatrix}0&1&0\\1&0&1\\0&1&0\end{pmatrix}\begin{pmatrix}0&1&0\\1&0&1\\0&1&0\end{pmatrix}=\begin{pmatrix}1&0&1\\0&2&0\\1&0&1\end{pmatrix}\qquad A^4=\begin{pmatrix}2&0&2\\0&4&0\\2&0&2\end{pmatrix}$$

$$A^8=\begin{pmatrix}8&0&8\\0&16&0\\8&0&8\end{pmatrix}$$

$$A^{1000}\cdot A=\begin{pmatrix}2^{499}&0&2^{499}\\0&2^{500}&0\\2^{499}&0&2^{499}\end{pmatrix}\begin{pmatrix}0&1&0\\1&0&1\\0&1&0\end{pmatrix}=\begin{pmatrix}0&2^{500}&0\\2^{500}&0&2^{500}\\0&2^{500}&0\end{pmatrix}$$

8.

$$A(G)=\begin{array}{c}\\A\\B\\C\\D\end{array}\begin{array}{c}\begin{array}{cccc}A&B&C&D\end{array}\\\begin{pmatrix}0&1&0&0\\1&0&0&0\\0&0&0&1\\0&0&1&0\end{pmatrix}\end{array}$$

书P253． chap10.3

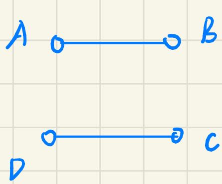
无向图．

$$A^2(G)=\begin{pmatrix}0&1&0&0\\1&0&0&0\\0&0&0&1\\0&0&1&0\end{pmatrix}\begin{pmatrix}0&1&0&0\\1&0&0&0\\0&0&0&1\\0&0&1&0\end{pmatrix}=\begin{pmatrix}1&0&0&0\\0&1&0&0\\0&0&1&0\\0&0&0&1\end{pmatrix}=A^4(G).$$

$$\underline{R(G)=A(G)+A^2(G)+A^3(G)+A^4(G)}=\begin{pmatrix}2&2&0&0\\2&2&0&0\\0&0&2&2\\0&0&2&2\end{pmatrix}$$

<u>R(G)中存在 0 元素．故不连通．</u> ☆

偷偷画图验证下．



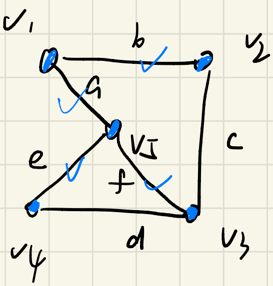
不连通 ✓

10. $$B_f(G) = \begin{array}{c|cccccc} & a & b & c & d & e & f \\ \hline v_1 & 1 & 1 & 0 & 0 & 0 & 0 \\ v_2 & 0 & 1 & 1 & 0 & 0 & 0 \\ v_3 & 0 & 0 & 1 & 1 & 0 & 1 \\ v_4 & 0 & 0 & 0 & 1 & 1 & 0 \\ v_5 & 1 & 0 & 0 & 0 & 1 & 1 \end{array}$$

求 $C_f(G)$ 与 $B_f(G)$

$\varepsilon = 6$, $v = 5$

$C_f = ([I]_{\varepsilon - v + 1} \,;\, C_{12})$



$$C_f(G) = \begin{array}{cc|cccc} c & d & a & b & e & f \\ \hline 1 & 0 & 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \end{array}$$

基本圈.

先排列余树边.

再排列树边.

$$S_f(G) = \begin{array}{cc|cccc} c & d & a & b & e & f \\ \hline 1 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{array}$$

$S_{11} = C_{12}^{T}$