

$$1) X = \{(2, U), (3, U), (4, U), (1, P), (2, P), (3, P), (4, P)\}$$

U = "without the passenger" ; P = "with passenger aboard"

$$A = \{u, d, l, r\}$$

up down left right

2)

$$P_d = \begin{bmatrix} 0,2 & 0 & 0,8 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0,2 & 0 & 0,8 & 0 \\ 0 & 0 & 0 & 0 & 0,2 & 0 & 0,8 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

$2, U$
 $3, U$
 $4, U$
 $2, P$
 $3, P$
 $4, P$

$$3) J(2, U) = J(3, U) = J(4, U) = J(1, P) = J(3, P) = J(4, P)$$

$$= 1 + 1x + 1x^2 + \dots$$

$$= \sum_{n=0}^{\infty} 0,9^n = 10$$

$$J(2, P) = 0 + 1x + 1x^2 + \dots$$

$$= \sum_{n=1}^{\infty} 0,9^n = 9$$

$$J = \begin{bmatrix} 10 \\ 10 \\ 10 \\ 10 \\ 9 \\ 10 \\ 10 \end{bmatrix}$$

