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①

$$F_1(s)=\begin{cases}0 & s<160\\ \frac{1}{20}s-8 & 160\le s<180\\ 1 & s\ge 180\end{cases}$$ بلند قد بودن ،

$$F_2(BMI)=\begin{cases}0 & BMI<25\\ \frac{1}{5}BMI-5 & 25\le BMI<30\\ 1 & BMI\ge 30\end{cases}$$

الف)

$$w_1=\frac{|E_1\cap E_2|}{|E_1|}=\frac{|\sum \min(F_1(v_1(i)),F_2(v_2(i)))|}{|\sum F_1(v_1(i))|}$$

$$w_1=\frac{\min(1,0.4)+\min(0.5,0.2)+\min(0,1)+\min(1,0.6)+\min(0,0.4)+\min(1,0)}{1+0.5+0+1+0+1}$$

$$\Rightarrow w_1=\frac{1.2}{3.5}=0.34$$

$$Q_1(w)=\begin{cases}0 & w<0.25\ ,\ w>0.75\\ 4w-1 & 0.25\le w<0.5\\ -4w+3 & 0.5\le w\le 0.75\end{cases}$$

$$Q_1(w=0.34)=4(0.34)-1=\boxed{0.36}=T(P_1)$$

ب)

$$w_2=\frac{|E_2\cap E_1|}{|E_2|}=\frac{\sum \min(F_2(v_2(i)),F_1(v_1(i)))}{\sum F_2(v_2(i))}=\frac{1.2}{0.4+0.2+1+0.6+0.4+0}$$

$$\Rightarrow w_2=\frac{1.2}{2.6}=0.46$$

$$Q_2(w)=\begin{cases}0 & w<0.4\\ 3w-1.2 & 0.4\le w\le 0.733\\ 1 & w>0.733\end{cases}$$

$$Q_2(w=0.46)=3(0.46)-1.2=\boxed{0.18}=T(P_2)$$

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(2)

$$J(a,b) = \min(1, 1-a+b)$$

$$R = \begin{matrix} \\ A \\ B \end{matrix}\begin{bmatrix} 1 & 1 \\ 0.6 & 1 \\ 0.7 & 1 \end{bmatrix}$$

الف)

$$B' = A' \circ R = [0.5 \;\; 0.9 \;\; 1]\begin{bmatrix} 1 & 1 \\ 0.6 & 1 \\ 0.7 & 1 \end{bmatrix} = [0.7 \;\; 1]$$

ب)

$$S(B') = [(0.7)^2 \;\; (1)^2] = [0.49 \;\; 1]$$