# Assignment 5 - Andw Caide

$\rho = \frac{\pi}{b}$, $\pi(+1 \mid \{s^A, s^B\}) = +1$, $\pi(0 \mid s^C) = +1$, $\gamma = 0.9$

**e1**

$s_0 = s^A$, $A_0 = +1$, $R_1 = 40$

$s_1 = s^B$, $A_1 = +1$, $R_2 = 30$

$s_2 = s^C$, $A_2 = 0$, $R_3 = 70$

**e2**

$s_0 = s^C$, $A_0 = -1$, $R_1 = 10$

$s_1 = s^B$, $A_1 = +1$, $R_2 = 50$

$s_2 = s^C$, $A_3 = 0$, $R_3 = 10$

**e1**

$\rho_0^1 = \frac{\pi(+1 \mid s^A)}{b(+1 \mid s^A)} = \frac{1}{.5} = 2$

$\rho_1^1 = \frac{\pi(+1 \mid s^B)}{b(+1 \mid s^B)} = \frac{1}{1/3} = 3$

$\rho_2^1 = 2$

**e2**

$\rho_0^2 = \frac{\pi(-1 \mid s^C)}{b(-1 \mid s^C)} = \frac{0}{.5} = 0$

$\rho_1^2 = \frac{\pi(+1 \mid s^B)}{b(+1 \mid s^B)} = \frac{1}{.3} = 3$

$\rho_2^2 = \frac{\pi(0 \mid s^C)}{b(0 \mid s^C)} = \frac{1}{.5} = 2$

a) $V_\pi^*(s^A) = \frac{1}{\sum \rho}[\sum \rho G]$ $\quad \rho^1 = 2 \cdot 3 \cdot 2 = 12$, $\rho^2 = 0$

$= \frac{1}{12}[12[40 + \gamma \cdot 30 + \gamma^2(70)]$

$\boxed{V_\pi(s^A) = 123.7}$

b) $V_\pi(s^B) = \frac{1}{6+6}[6[30 + \gamma 70] + 6[50 + \gamma 10]]$ $\quad \rho^1 = 3 \cdot 2 = 6$, $\rho^2 = 3 \cdot 2 = 6$

$= \frac{1}{12} + [6(93 + 59)]$

$= \frac{1}{2}(152) = \boxed{76 = V_\pi(s^B)}$

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c) $V_\pi(s^c) = \frac{1}{2+2}\left[2[70] + 2[10]\right]$

$\rho^1 = 2$

$\rho^2 = 2$

$V_\pi(s^c) = \frac{1}{4}(2(80))$

$V_\pi(s^c) = 40$