5. Exercise Six

△ Correlation Matrix: $R_{2\times2} = \begin{pmatrix} r_{11} & r_{12} \\ r_{21} & r_{22} \end{pmatrix} = \begin{pmatrix} 1 & 0.35 \\ 0.35 & 1 \end{pmatrix}$

△ first calculate the proportion w_1, w_2

$$\begin{cases} w_1 = (100\$ \times 200) / (100\$ \times 200 + 125\$ \times 100) = 61.54\% \\ w_2 = (125\$ \times 100) / (100\$ \times 200 + 125\$ \times 100) = 38.46\% \end{cases}$$

Thus: $E(R_p) = w_1 \cdot \mu_1 + w_2 \cdot \mu_2$

$= 61.54\% \times 0.1\% + 38.46\% \times 0.15\%$

$= 0.119\%$

$\sigma_{Rp}^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2\rho_{12}\sigma_1\sigma_2$

$= (61.54\%)^2 \times (3\%)^2 + (38.46\%)^2 \times (14\%)^2 + 2 \times (61.54\%) \times (38.46\%) \times 0.35 \times (3\%) \times (14\%)$

$= 0.00007633314$

$\therefore \sigma_{Rp} = \sqrt{\sigma_{Rp}^2} = 2.78272\%$