NLP Written Assignment

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→ Question 1:

$P(RRGG|\lambda)$
$= \alpha_4(u_1) + \alpha_4(u_2) + \alpha_4(u_3)$

$\alpha_1(u_1) = 0.33 \times P(R|u_1)$
$= 0.33 \times 0.3 = 0.1$

$\alpha_1(u_2) = 0.33 \times 0.1$
$= 0.033$

$\alpha_1(u_3) = 0.33 \times 0.6$
$= 0.2$

$\alpha_2(u_1) = 0.1 \times 0.1 \times 0.3 + 0.033 \times 0.6 \times 0.3 + 0.2 \times 0.3 \times 0.3$
$= 0.02694$

$\alpha_2(u_2) = 0.1 \times 0.4 \times 0.1 + 0.033 \times 0.2 \times 0.1 + 0.2 \times 0.4 \times 0.1 = 0.01266$

$\alpha_2(u_3) = 0.1 \times 0.5 \times 0.6 + 0.033 \times 0.2 \times 0.6 + 0.2 \times 0.3 \times 0.6 = 0.06996$

$\alpha_3(u_1) = 0.02694 \times 0.1 \times 0.5 + 0.01266 \times 0.6 \times 0.5 + 0.06996 \times 0.3 \times 0.5 = 0.015639$

$\alpha_3(u_2) = 0.0165168$, $\alpha_3(u_3) = 0.003699$

$\alpha_4(u_1) = 6.29184 \times 10^{-3}$, $\alpha_4(u_2) = 4.415424 \times 10^{-3}$

$\alpha_4(u_3) = 1.223256 \times 10^{-3}$

$\therefore P(RRGG|\lambda) = 0.011930052$