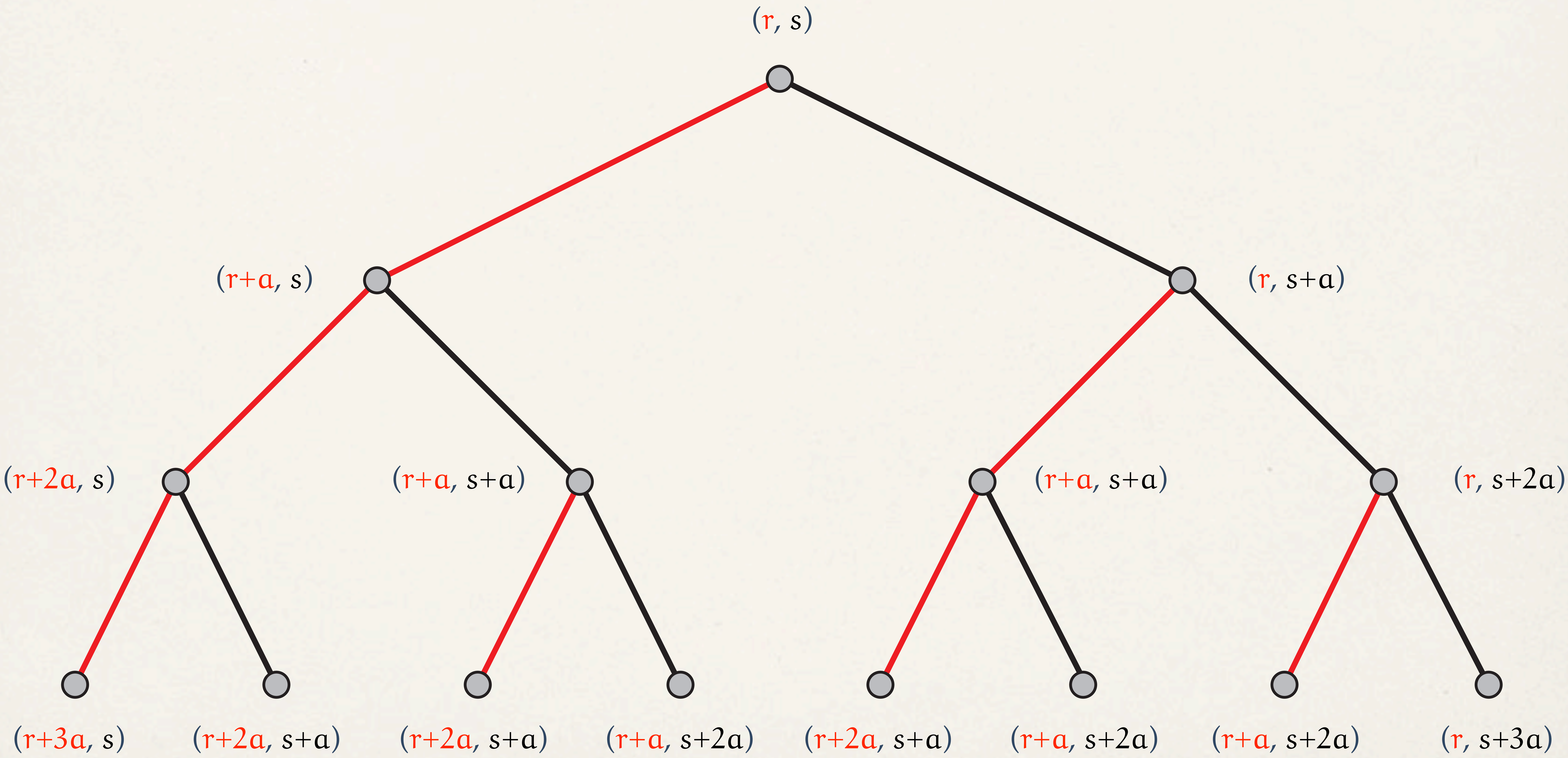
A population growth tree



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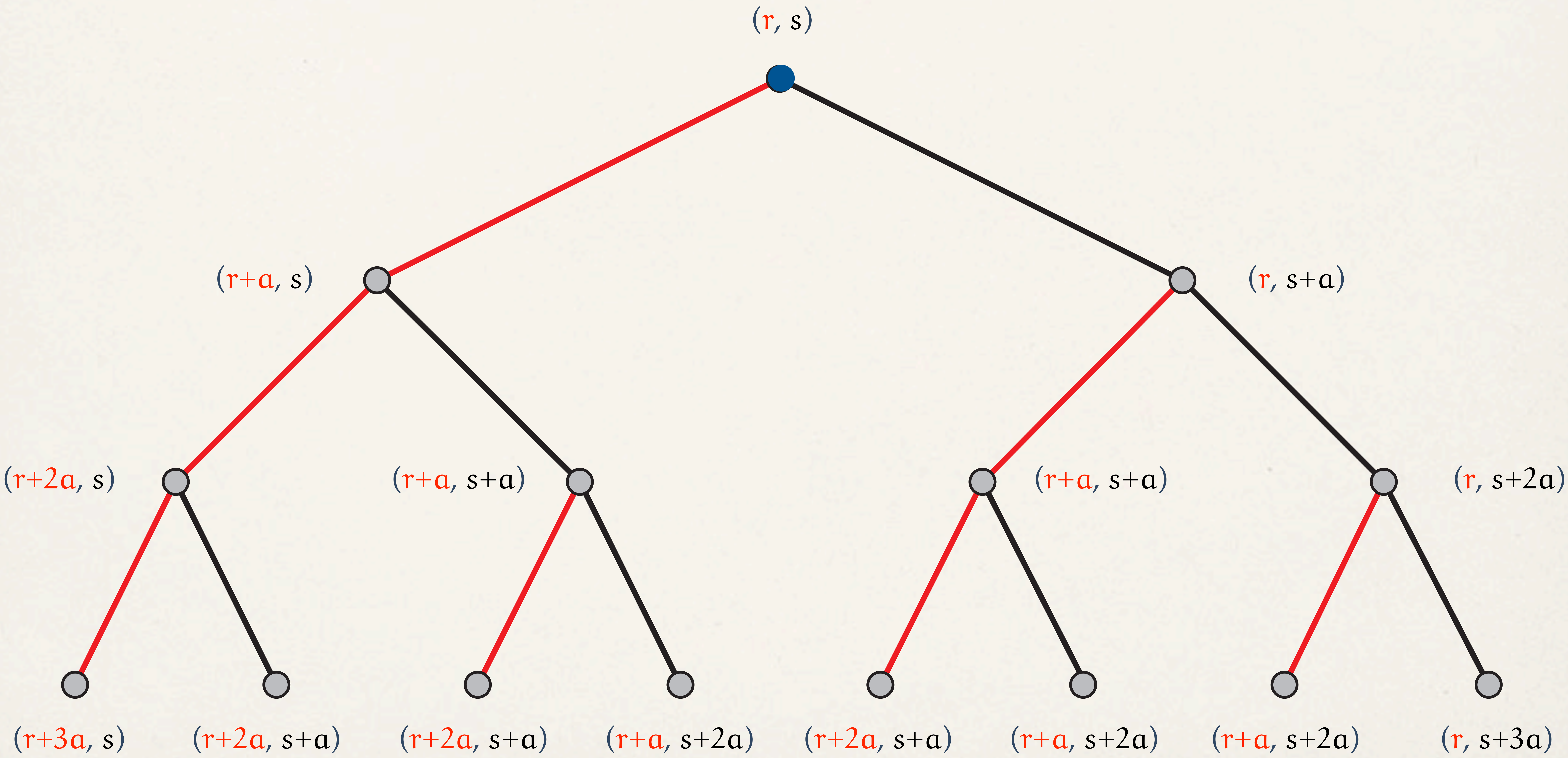

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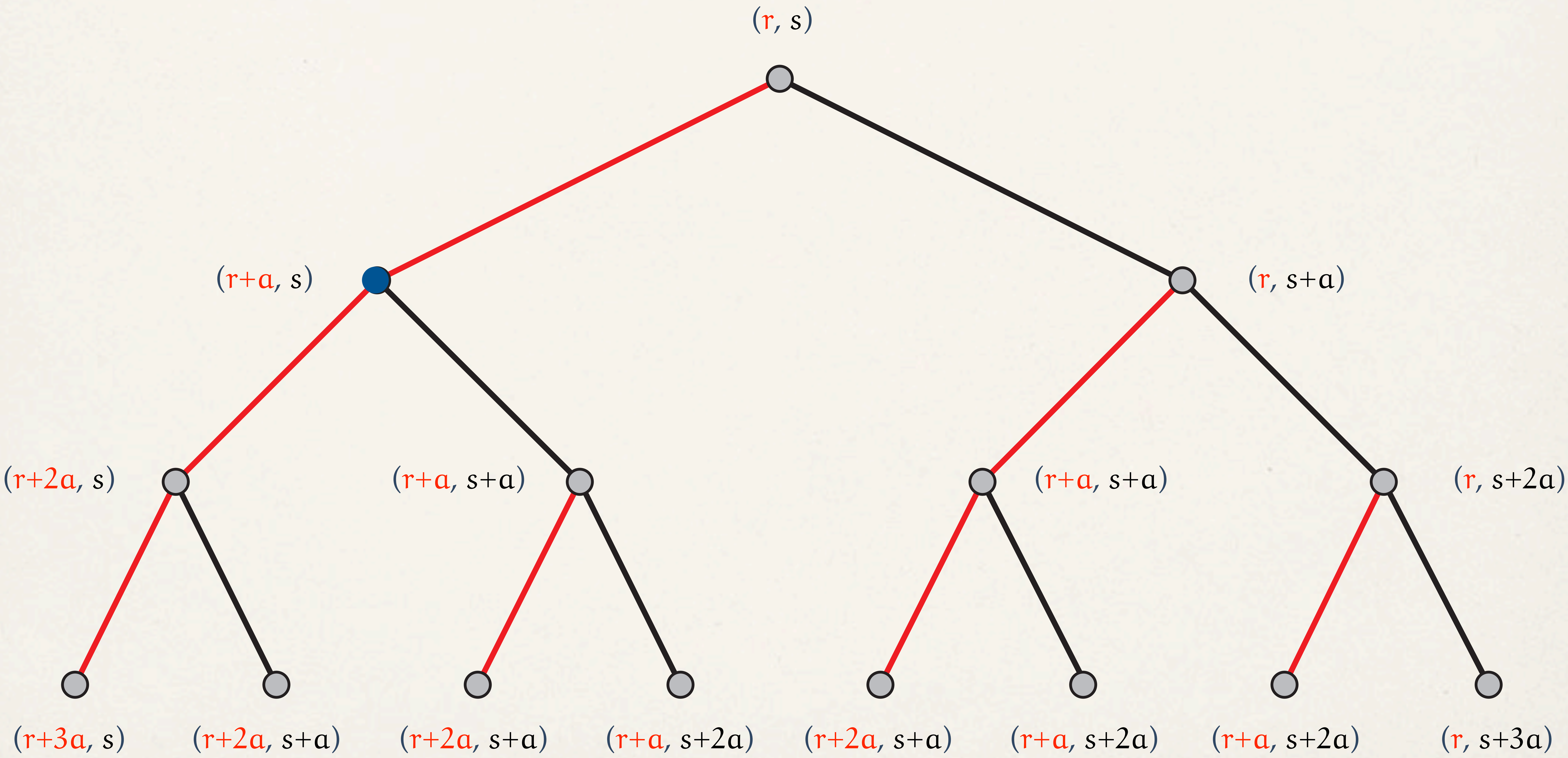

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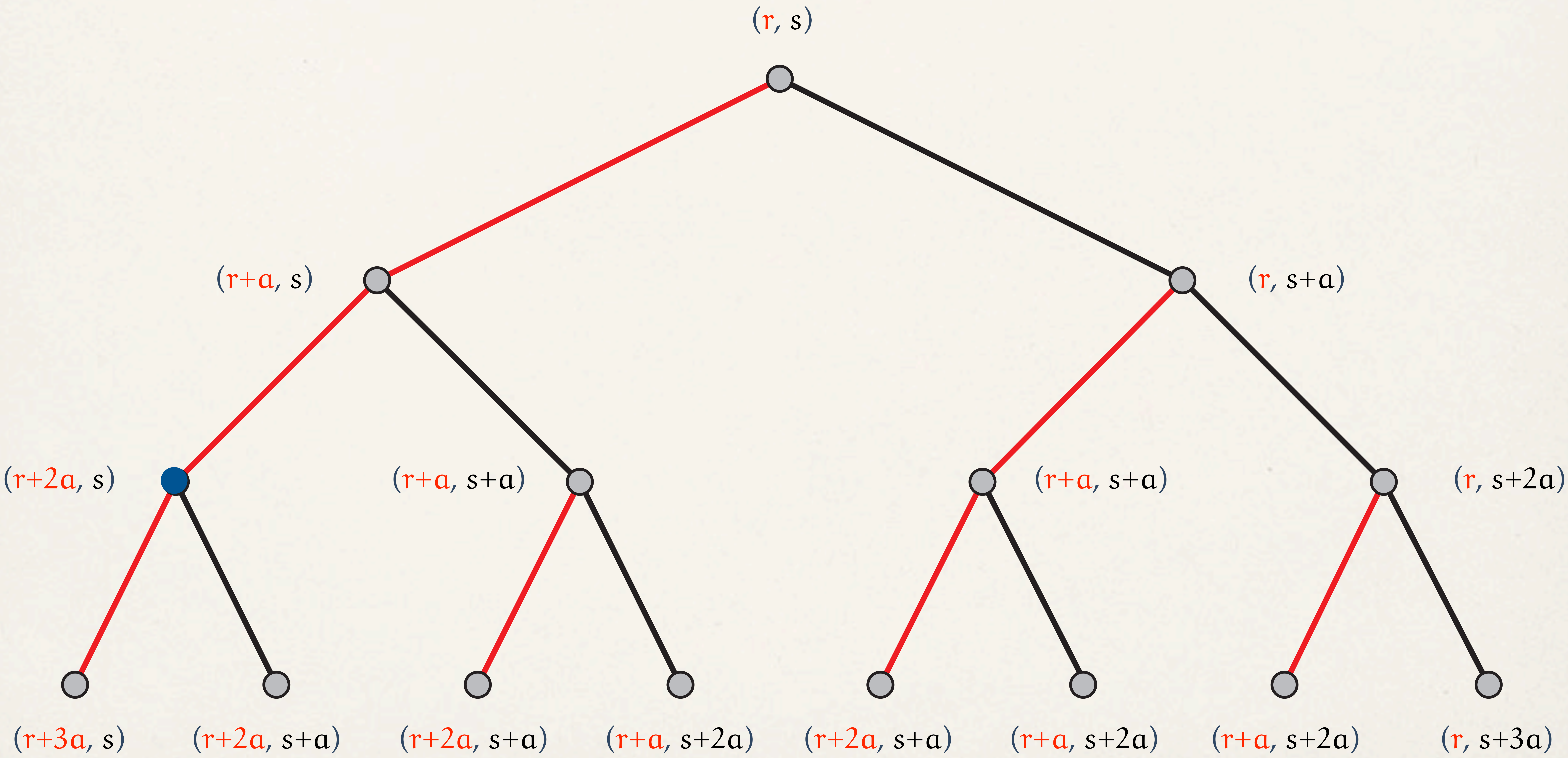

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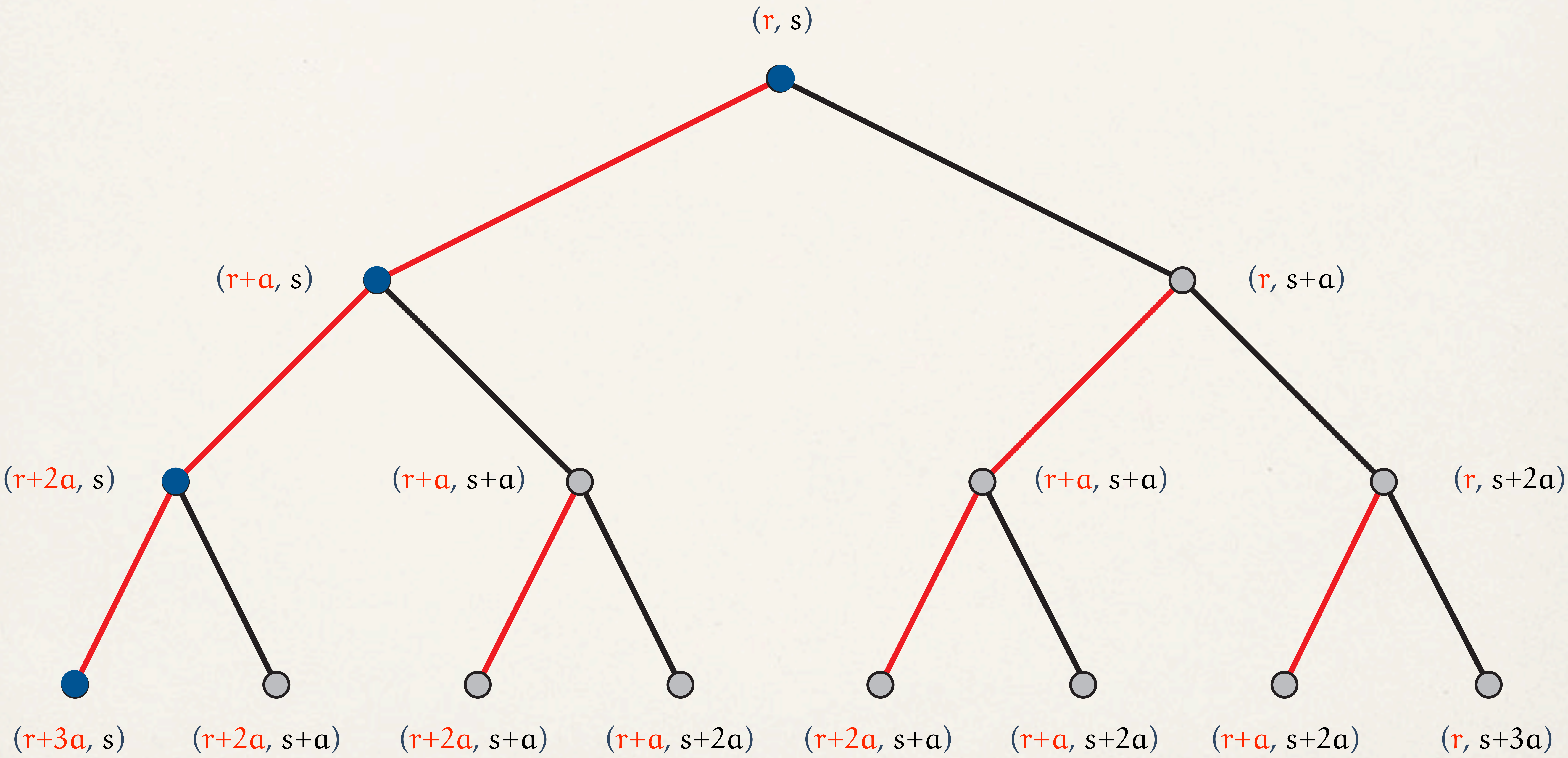

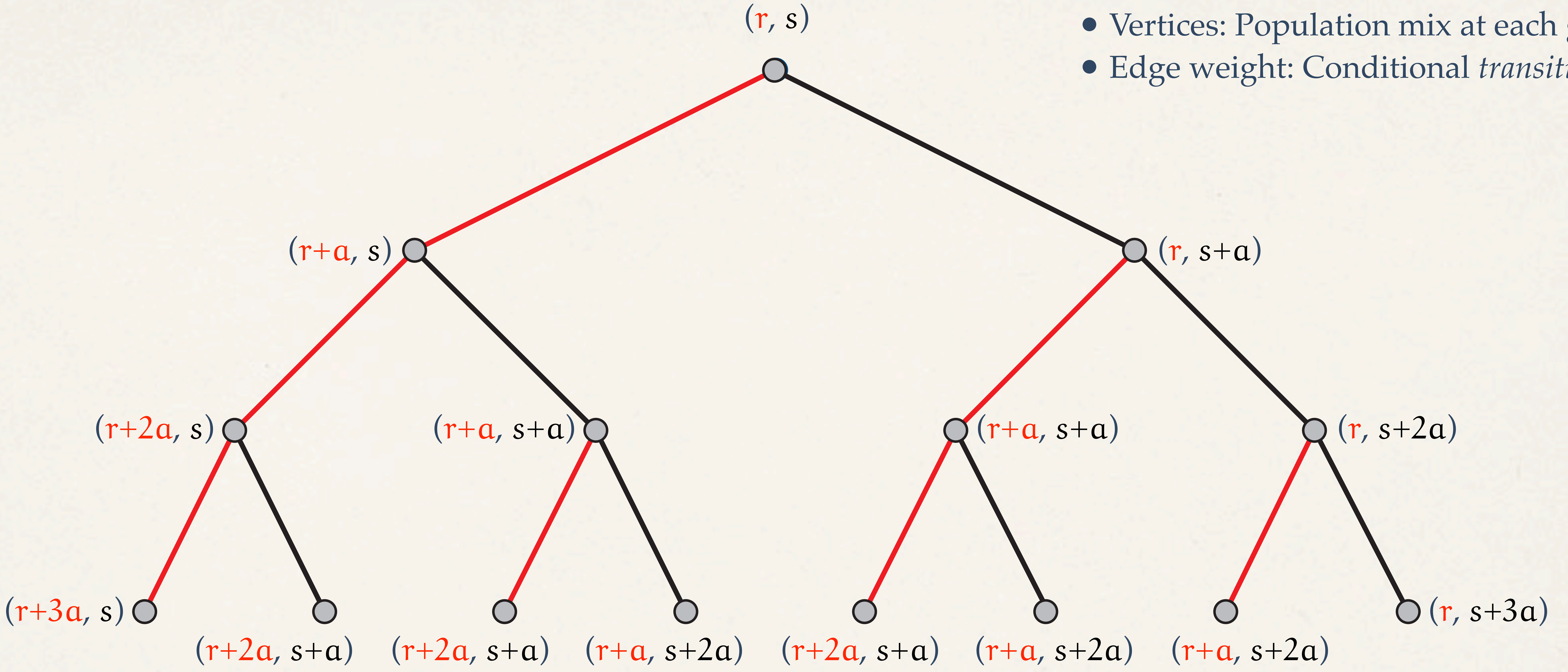

- Vertices: Population mix at each generation.
- Edge weight: Conditional *transition* probability.

- *Sample space* Ω: each sequence of ball colours drawn leads to a distinct outcome $\omega = (x_1, x_2, x_3, \dots)$ where $x_1, x_2, x_3, \dots \in$ {red, black}.
- The *events of interest*: $R_k :=$ kth draw shows red $= \{ (x_1, x_2, \dots, x_k, \dots) : x_k = \text{red} \}$; $B_k := (R_k)^c = \{ (x_1, x_2, \dots, x_k, \dots) : x_k = \text{black} \}$.
- The implicit *probability measure* **P**, from initial selection through conditional evolution:

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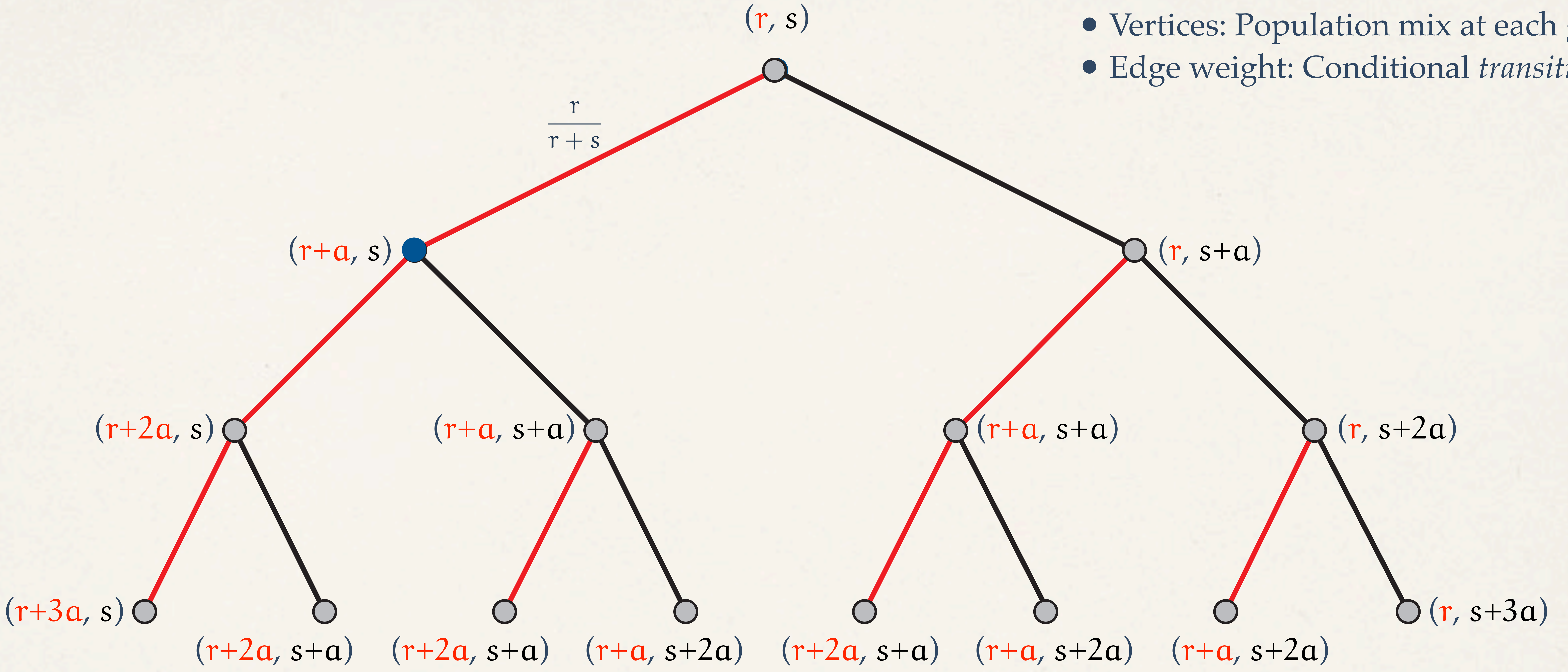

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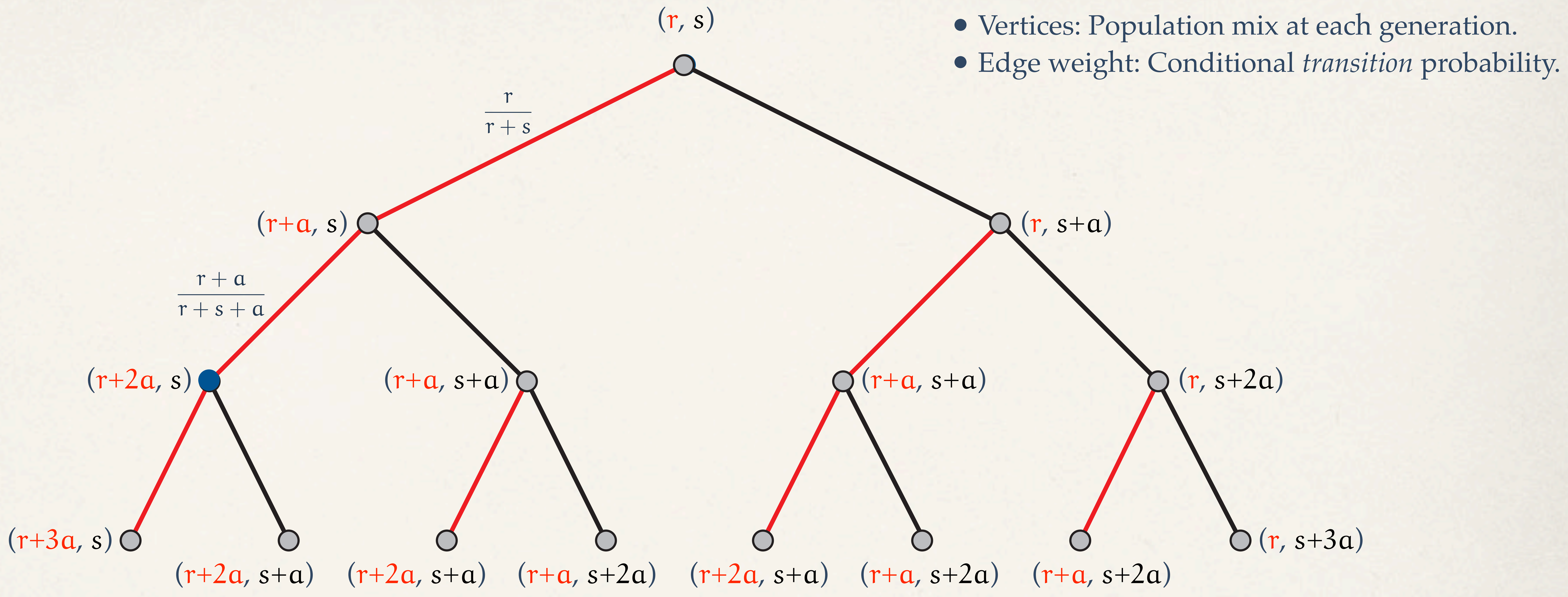

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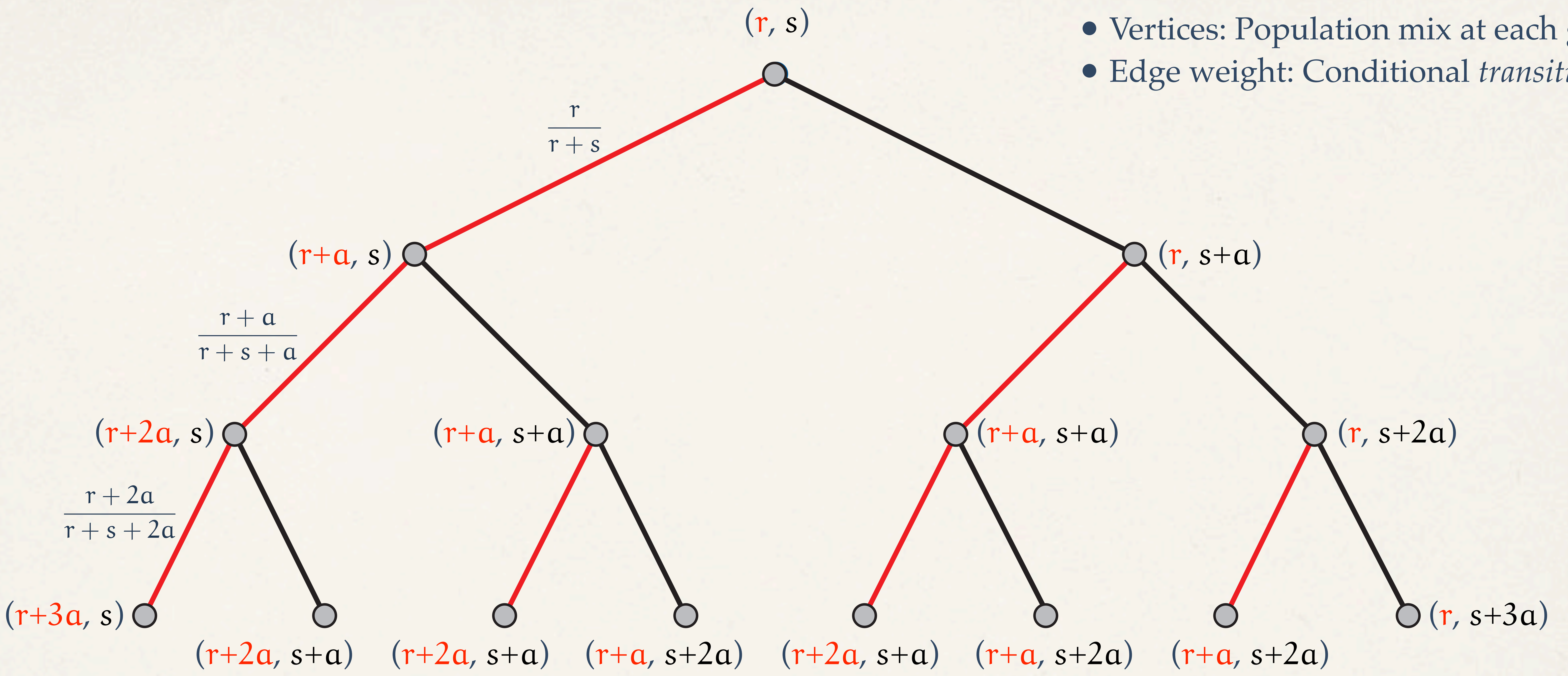

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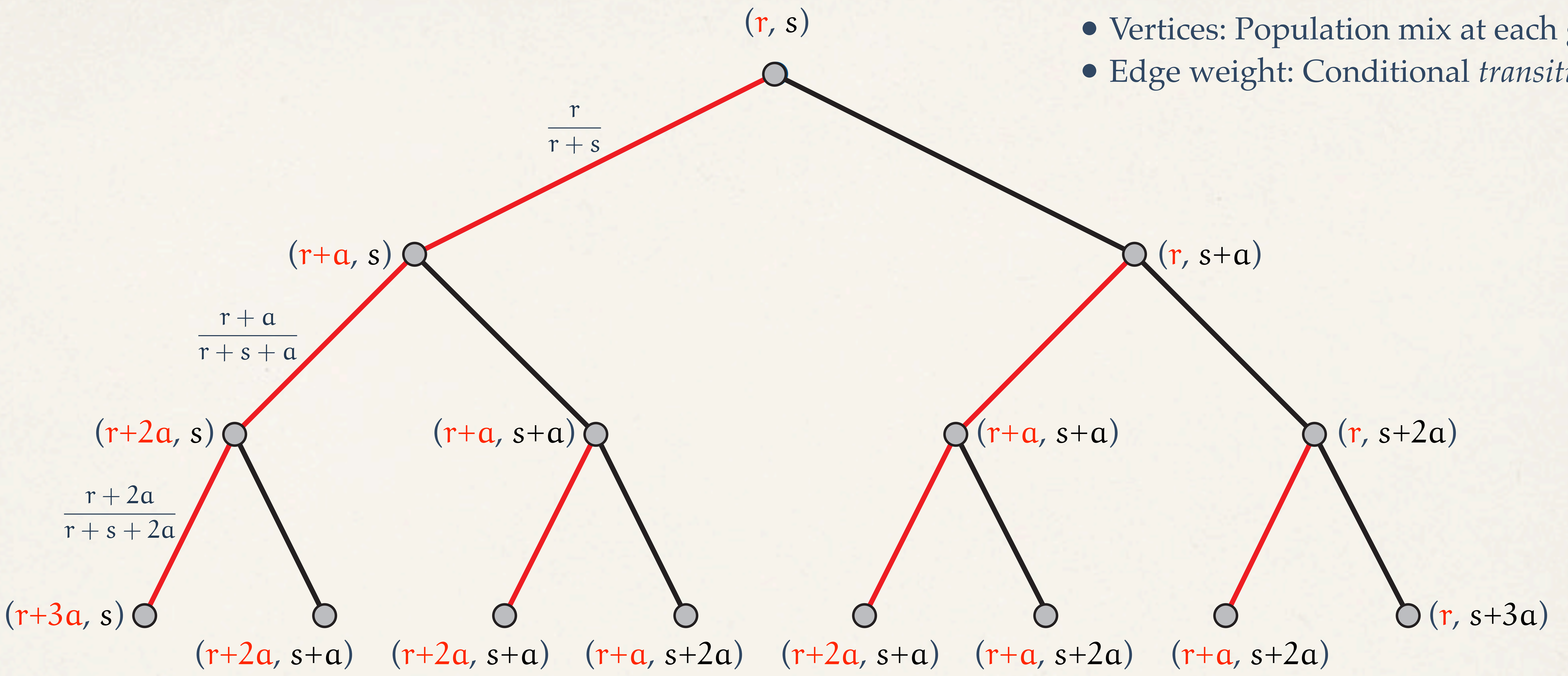

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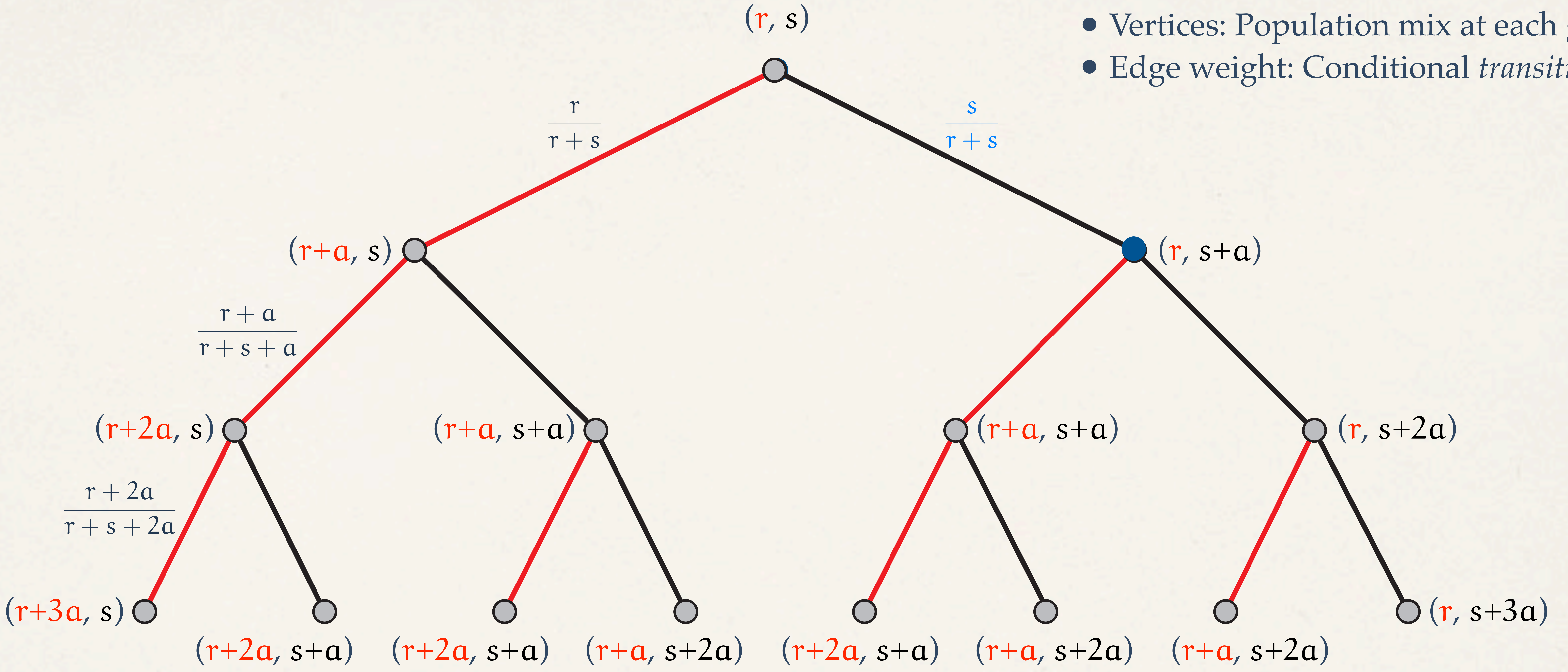
Evaluate $\mathbf{P}(B_1)$, $\mathbf{P}(R_2 \mid B_1)$, and $\mathbf{P}(R_3 \mid R_2 \cap B_1)$.



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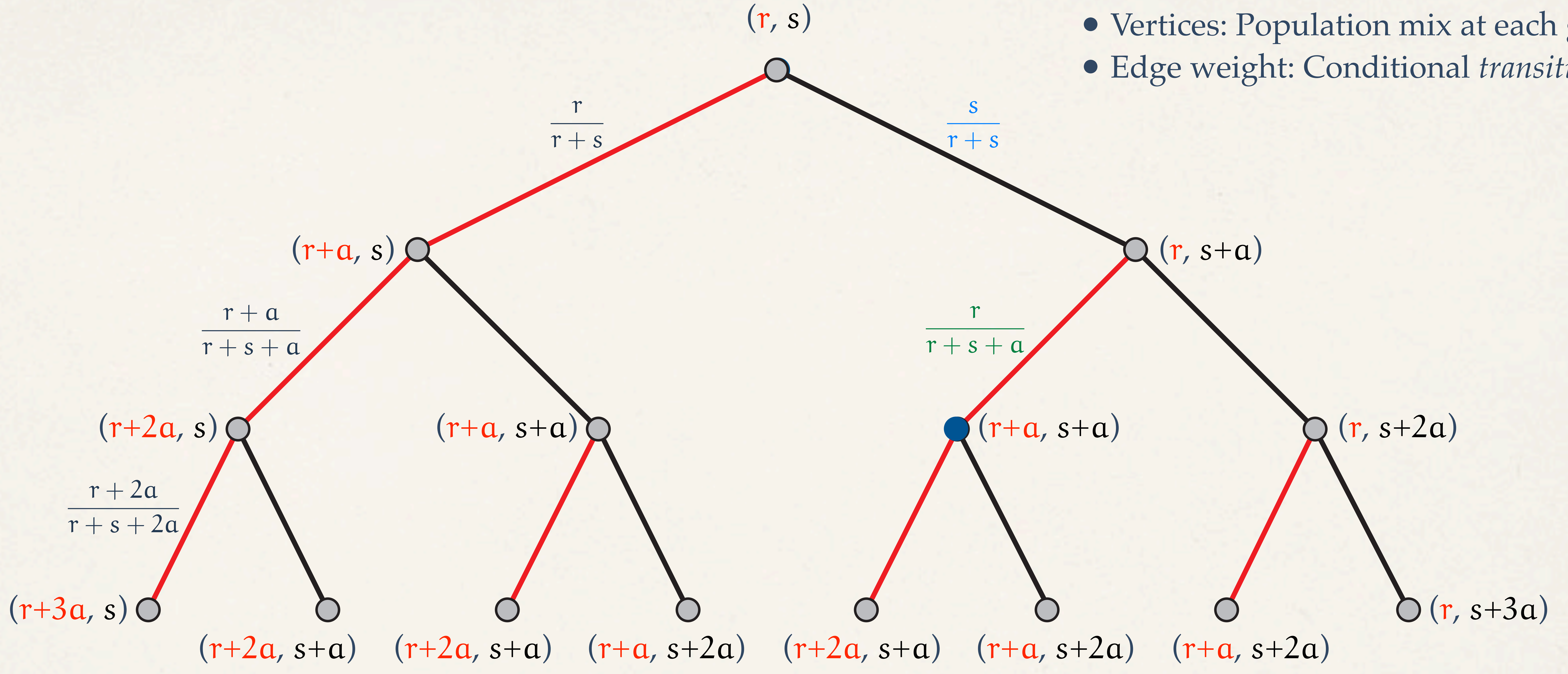

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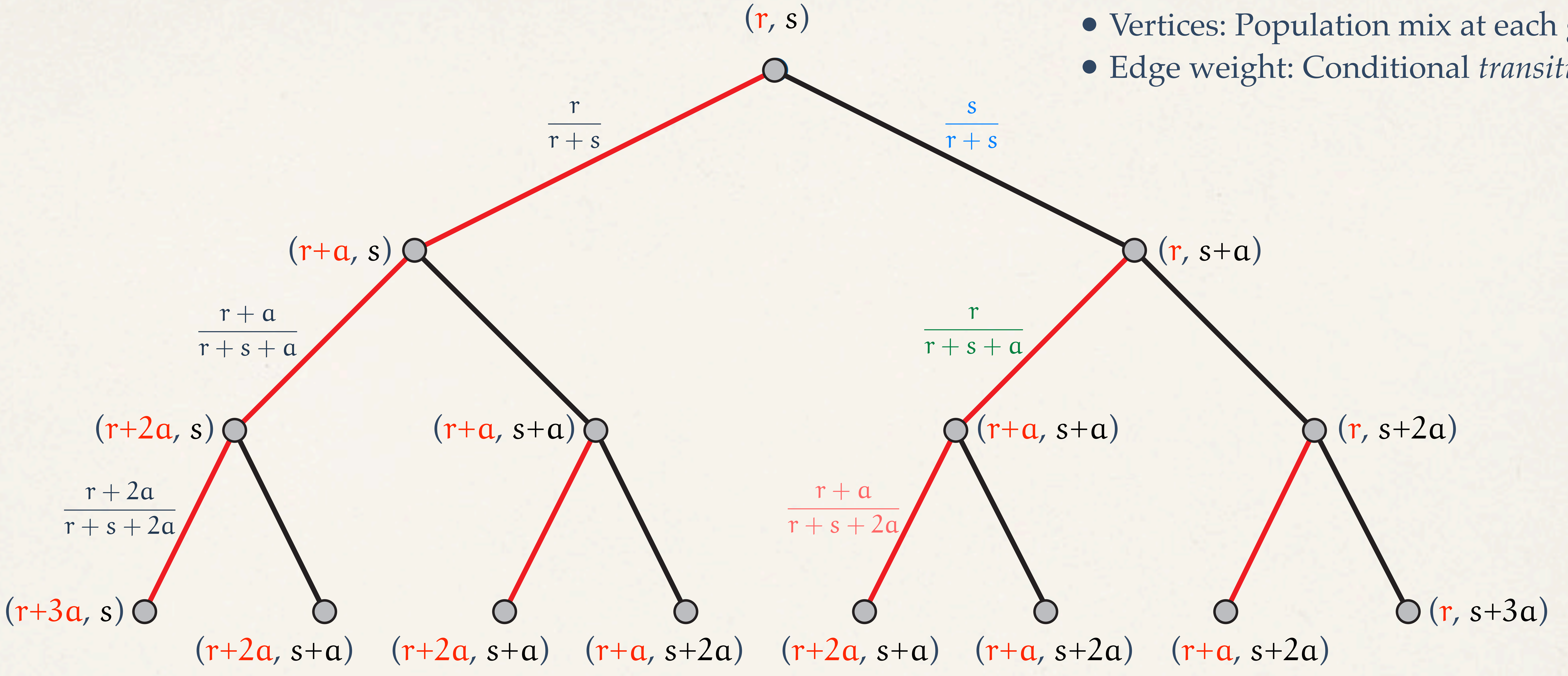

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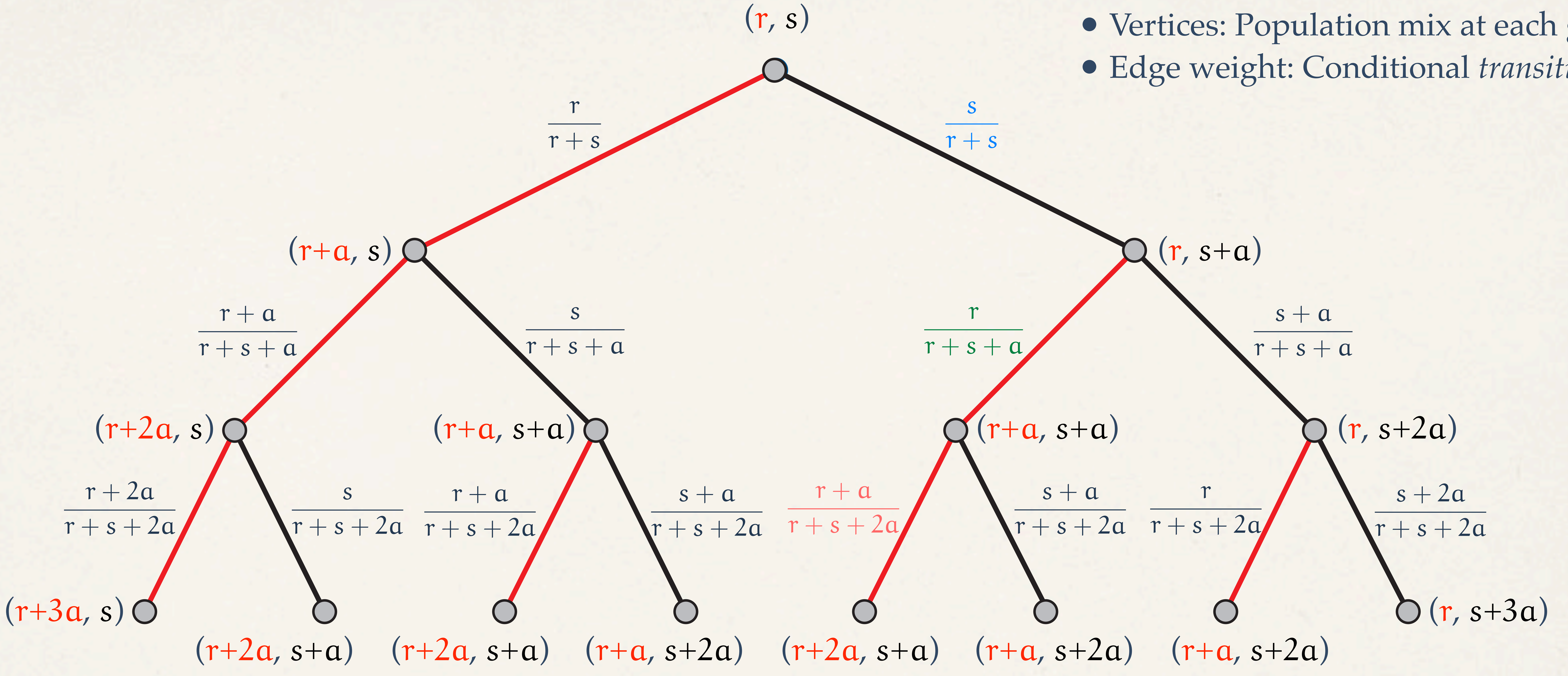

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