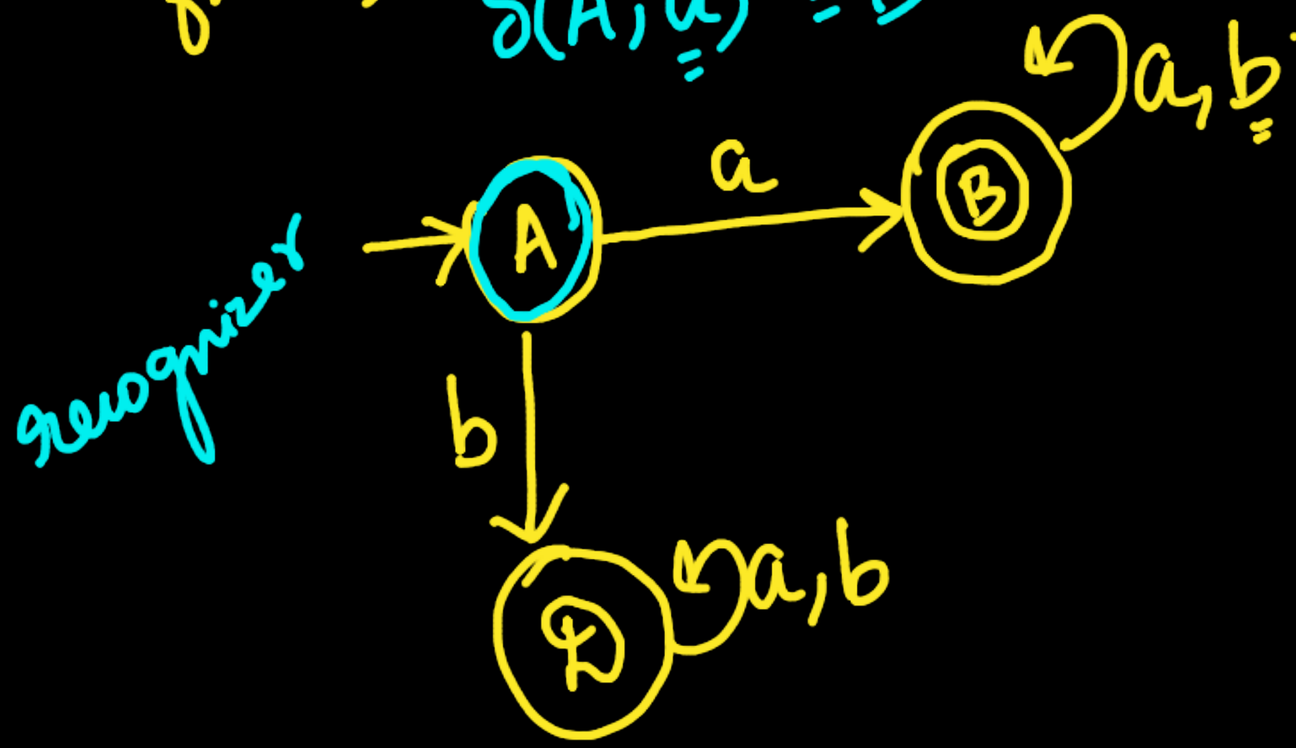
DFA Construction

$L = \{ w : aw, w \in \{a,b\}^* \}$

$L = \{ a, ab, aa, abbba, aaaba \ldots \}$ (infinite)

$\delta(A, a) = B$

$\delta : Q \times \Sigma \to Q$



abb

b	a	b	X

$\delta^*(A, abb) = \delta^*(B, bb)$

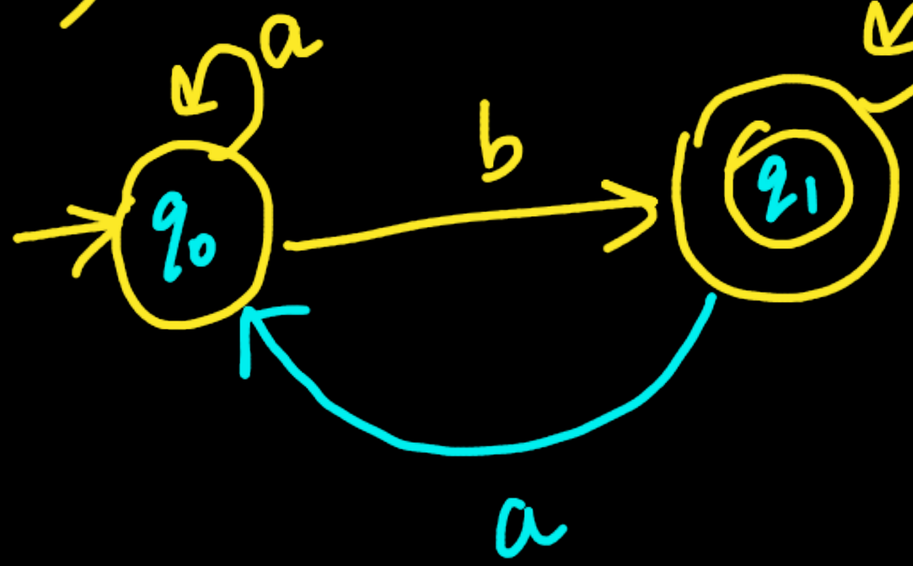
$= \delta(B, b)$

$= B$ ✓

$L = \{ w : wb,\ w \in \{a,b\}^* \}$

$L = \{ b,\ ab,\ bb,\ (\text{any no. of a's \& b's})\ b \ldots \}$

(infinite)

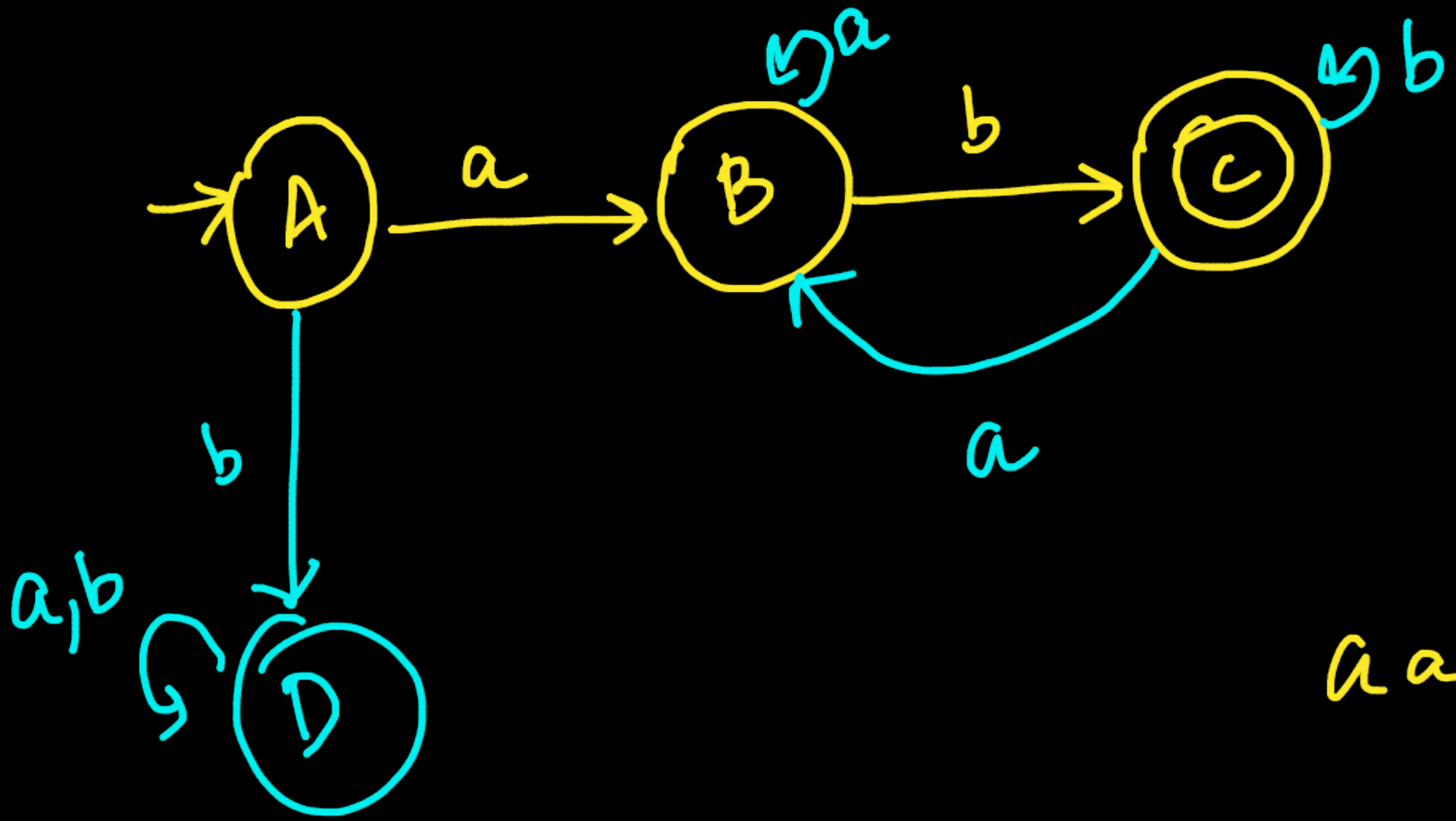


abba rejected

$L = \{ w : awb, w \in \{a,b\}^* \}$

$=$

$L = \{ ab,\ a\underline{\underline{a}}b \text{ or } a\underline{\underline{b}}b,\ a\ldots \overset{a\text{'s}}{\underset{b\text{'s}}{\text{or}}}\ b \}$



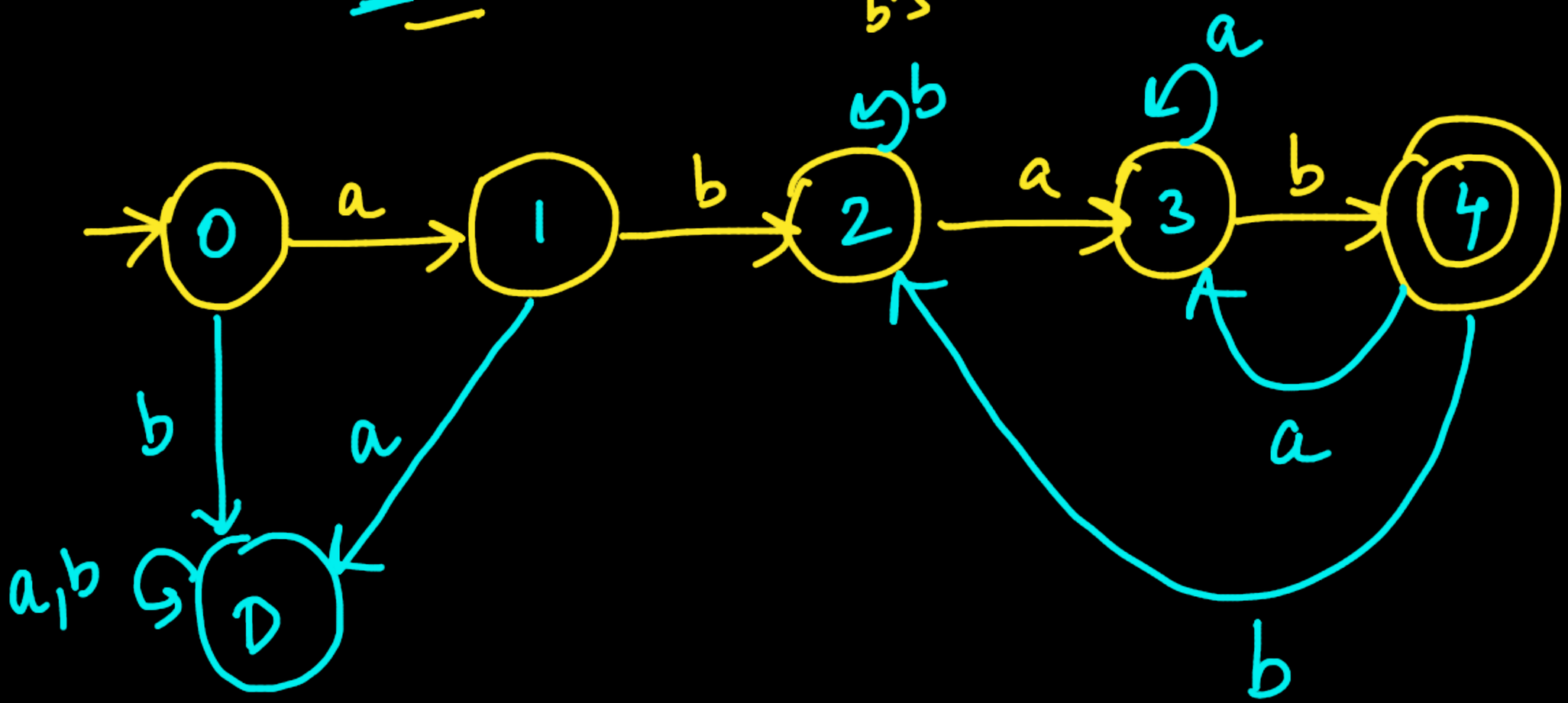
Skeleton DFA

$\underline{\underline{a}}aab\underline{\underline{a}}ab\underline{\underline{b}}bb$

aaba X

$L = \{ w : ab\,w\,ab,\ w \in \{a,b\}^* \}$

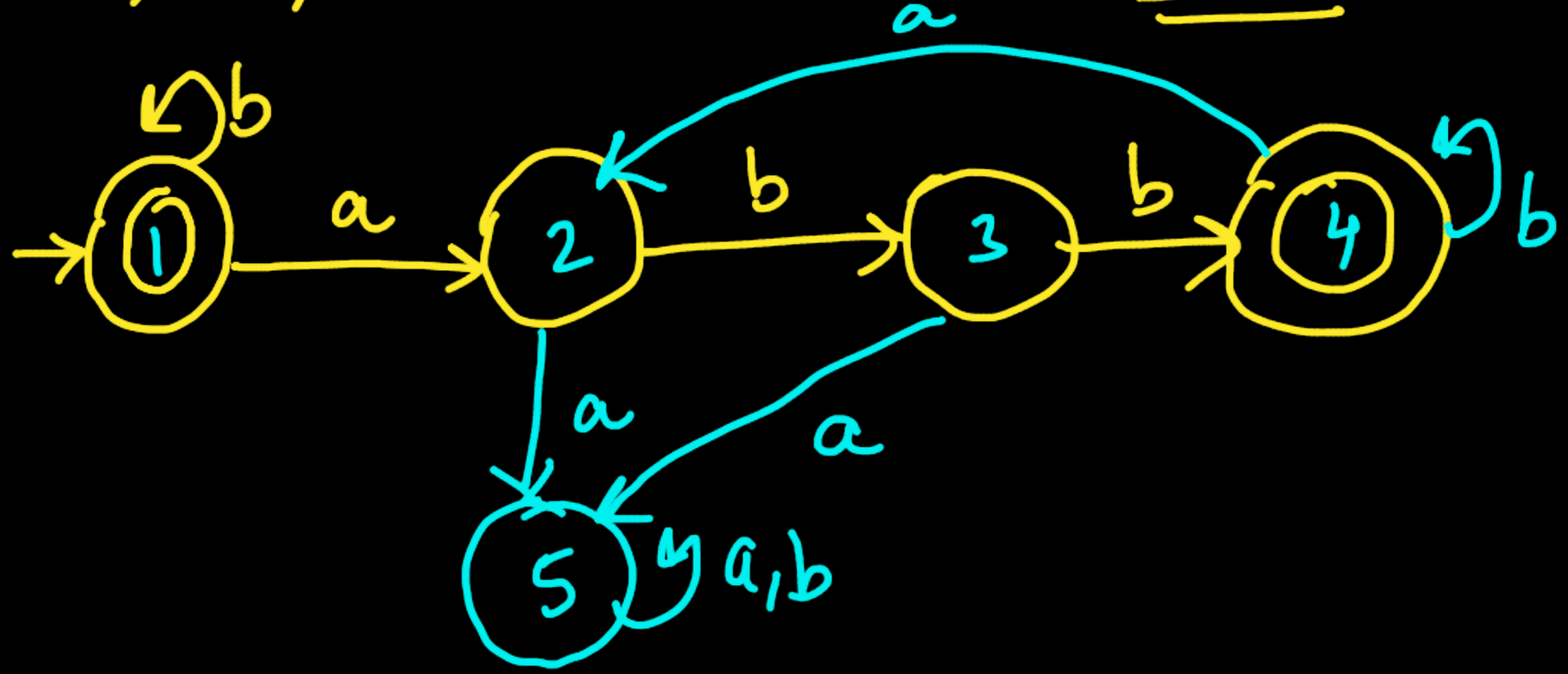
$L = \{ abab,\ ab\ (\text{any } a\text{'s or } b\text{'s})\ ab \ldots \}$ abbbaaabbab



Construct DFA to accept the lang that accepts set of strings where every a is followed by "bb".

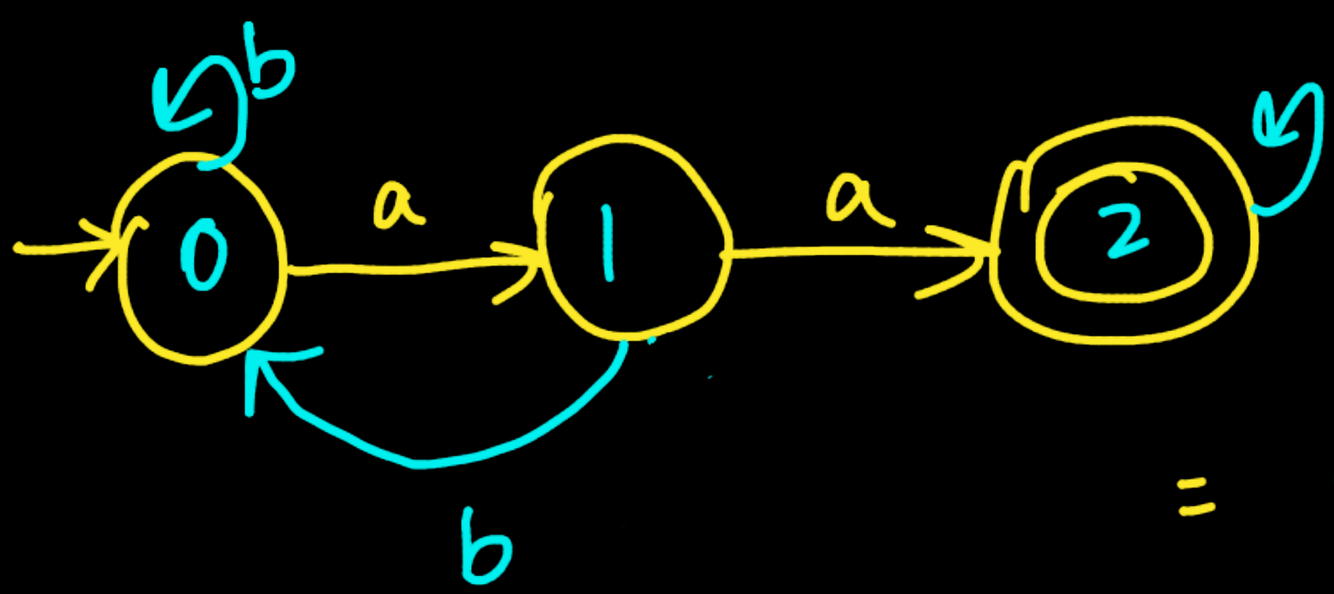
$L = \{ \lambda, b, bb's \ldots, abb, bbabbbbabbbbb \ldots \}$

baab ✗



Construct a DFA to accept lang of strings over $\Sigma = \{a, b\}$ where every string must contain "aa" as substring.

$L = \{$ aa, b's or a's aa a's or b's ... $\}$



rejected!

$\delta^*(0, abb)$

$= \delta^*(1, bb)$

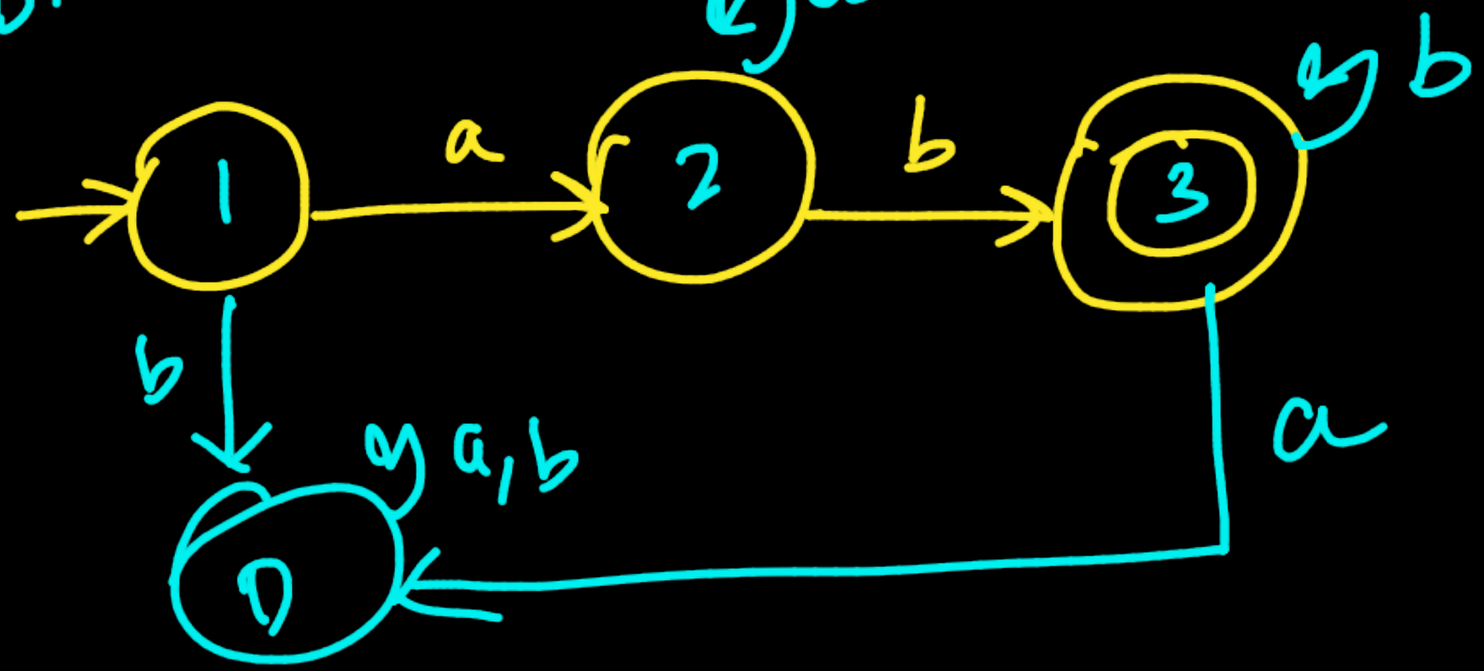
$= \delta(0, b) = 0$ ✗ Non-final state

Construct DFA to accept the following

$L = \{ a^n b^m \mid n, m \geq 1 \}$ $n \geq 1$, $m \geq 1$

$L = \{ ab, aab, abb, abbb, aa\ldots bb\ldots \}$

$a^+ b^+$



Construct a DFA to accept the lang

$L = \{ a^n b^m \mid n, m \geq 0 \}$ $n \geq 0, m \geq 0$ Homework

$L = \{ \lambda, aa\ldots, bbb\ldots, aa\ldots bb\ldots$