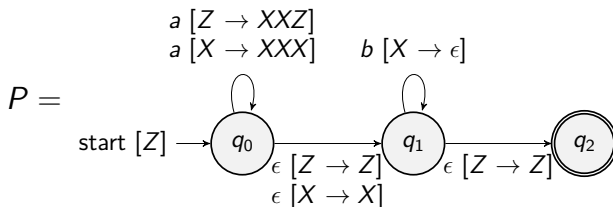Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word $w =$ a   a   b   b   b   b

Stack $\alpha =$

							Z

$P =$

$$a \; [Z \to XXZ]$$
$$a \; [X \to XXX] \qquad b \; [X \to \epsilon]$$

start $[Z] \to$ q_0 $\to$ q_1 $\to$ q_2

$\epsilon \; [Z \to Z]$
$\epsilon \; [X \to X]$

$\epsilon \; [Z \to Z]$

Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word $w =$

a	a	b	b	b	b

Stack $\alpha =$

						Z

$P =$

$$a\ [Z \to XXZ]$$
$$a\ [X \to XXX] \qquad b\ [X \to \epsilon]$$

start $[Z] \longrightarrow q_0 \longrightarrow q_1 \longrightarrow q_2$

$$\epsilon\ [Z \to Z]$$
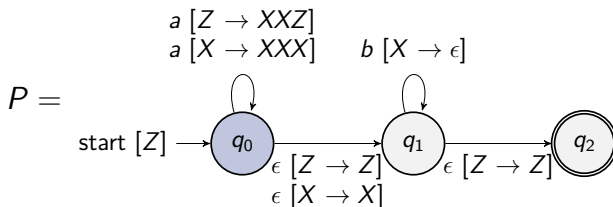$$\epsilon\ [X \to X]$$

$$\epsilon\ [Z \to Z]$$

Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word	$w =$	a	a	b	b	b	b
Stack	$\alpha =$					X	X	Z

$P =$

Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

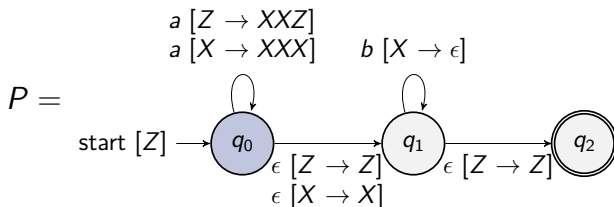| Word	$w =$	a	a	b	b	b	b	
Stack	$\alpha =$			X	X	X	X	Z

$$P =$$

Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word	$w =$	a	a	b	b	b	b
Stack	$\alpha =$			X	X	X	X	Z

$P =$

$a\ [Z \to XXZ]$
$a\ [X \to XXX]$ $b\ [X \to \epsilon]$

start $[Z] \to$ q_0 $\epsilon\ [Z \to Z]$ q_1 $\epsilon\ [Z \to Z]$ q_2
$\epsilon\ [X \to X]$
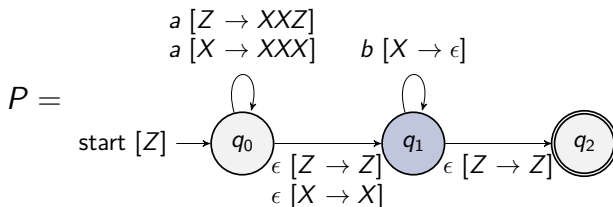
Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word	$w =$	a	a	b	b	b	b
Stack	$\alpha =$				X	X	X	Z

$P =$

$a\ [Z \to XXZ]$
$a\ [X \to XXX]$ $b\ [X \to \epsilon]$

start $[Z] \to q_0$ q_1 q_2

$\epsilon\ [Z \to Z]$ $\epsilon\ [Z \to Z]$
$\epsilon\ [X \to X]$

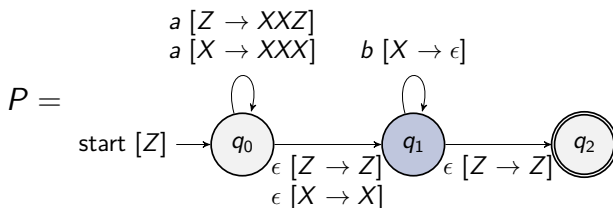Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word $\quad w = \quad$

	a	a	b	b	b	b

Stack $\quad \alpha = \quad$

				X	X	Z

$P =$

$a\ [Z \to XXZ]$
$a\ [X \to XXX]$ $\qquad b\ [X \to \epsilon]$

start $[Z] \longrightarrow (q_0)$ $\longrightarrow (q_1)$ $\longrightarrow (q_2)$

$\epsilon\ [Z \to Z]$ $\quad \epsilon\ [Z \to Z]$
$\epsilon\ [X \to X]$
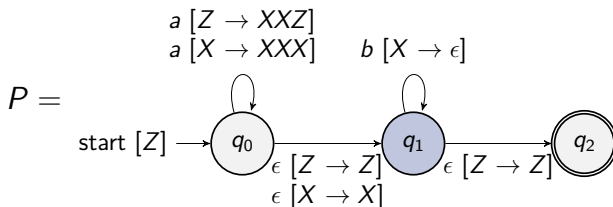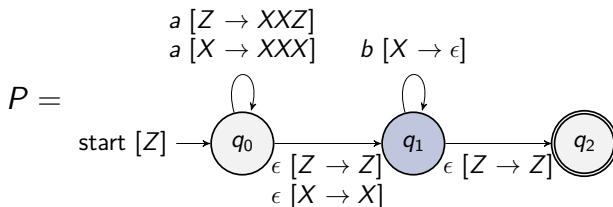
Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word $w =$ a   a   b   b   b   b

Stack $\alpha =$ $\qquad$ X Z

$P =$

$a\ [Z \to XXZ]$
$a\ [X \to XXX]$ $b\ [X \to \epsilon]$

start $[Z] \to q_0$
$\epsilon\ [Z \to Z]$
$\epsilon\ [X \to X]$
q_1 $\epsilon\ [Z \to Z]$ q_2

Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word $\quad w = \quad$ a $\quad$ a $\quad$ b $\quad$ b $\quad$ b $\quad$ b

Stack $\quad \alpha = \quad$ [ ] [ ] [ ] [ ] [ ] [ ] Z

$P =$

$$a \; [Z \rightarrow XXZ]$$
$$a \; [X \rightarrow XXX] \qquad b \; [X \rightarrow \epsilon]$$

start $[Z] \rightarrow q_0 \xrightarrow{\;\epsilon \; [Z \rightarrow Z]\;} q_1 \xrightarrow{\;\epsilon \; [Z \rightarrow Z]\;} q_2$
$$\epsilon \; [X \rightarrow X]$$
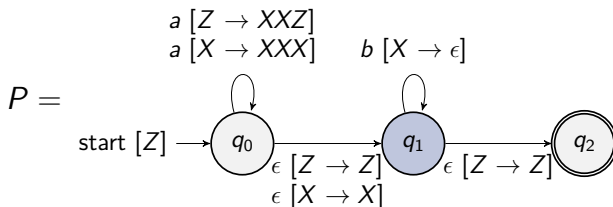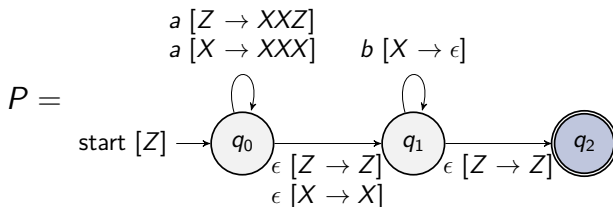
Construct a **PDA** that accepts the language by **final states**:

$$L(P) = \{a^n b^{2n} \mid n \geq 0\}$$

Word $w =$ a   a   b   b   b   b

Stack $\alpha =$ | | | | | | | Z |

$P =$

$a\ [Z \to XXZ]$
$a\ [X \to XXX]$ $b\ [X \to \epsilon]$

start $[Z] \longrightarrow$ q_0 $\xrightarrow{\epsilon\ [Z \to Z]}$ q_1 $\xrightarrow{\epsilon\ [Z \to Z]}$ q_2
$\epsilon\ [X \to X]$

aabbbb $\in L_F(P)$!