Temporal Logic:
18 fundamental patterns

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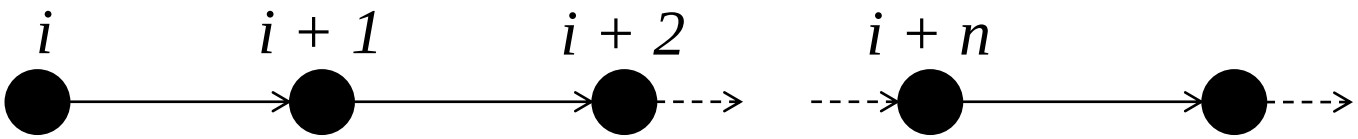
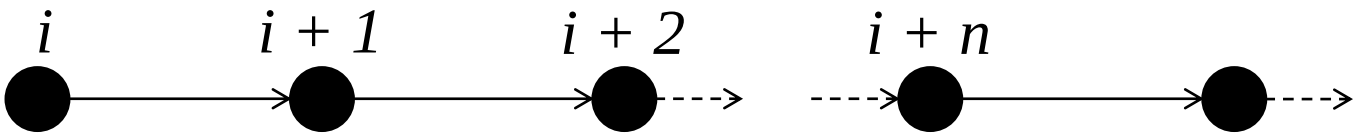
Example 1

$\phi \rightarrow \psi$



Example 1

$\phi \rightarrow \psi$

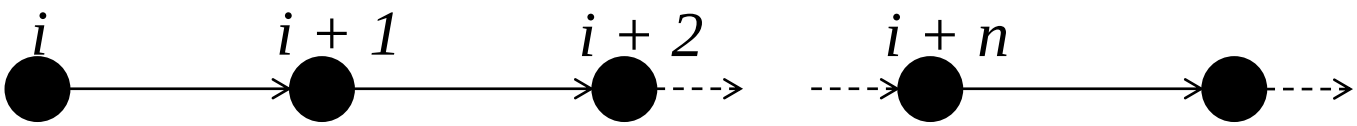


ϕ

ψ

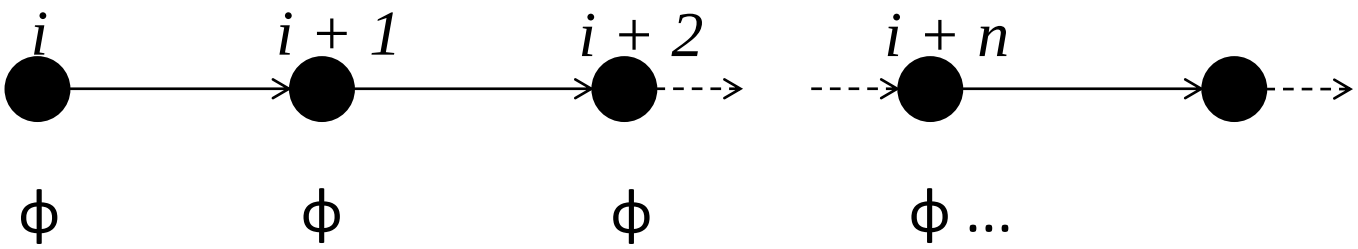
Example 2

□ϕ



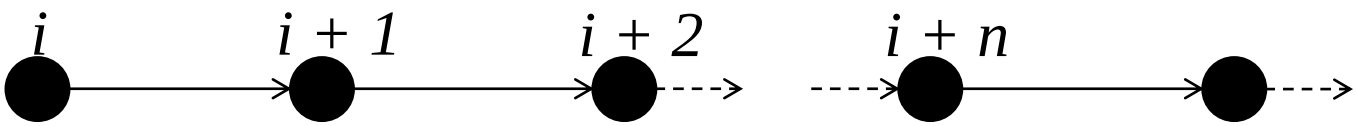
Example 2

□ϕ



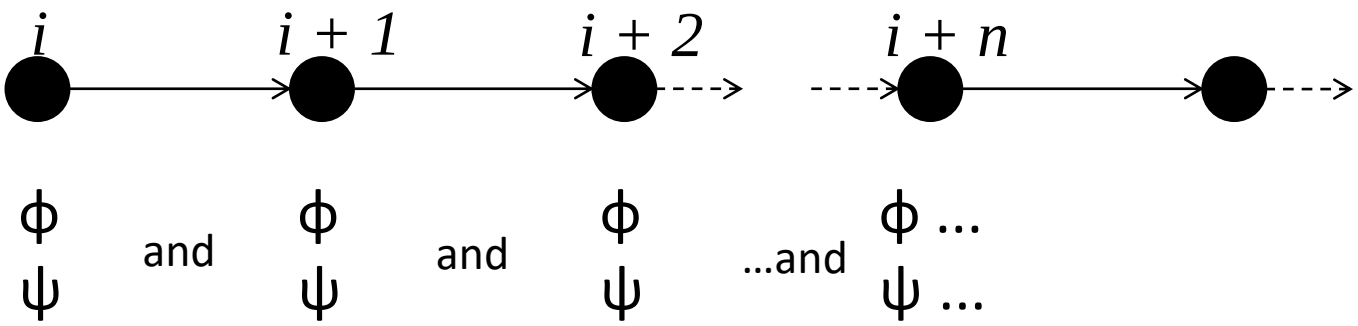
Example 3

$\Box (\phi \wedge \psi)$



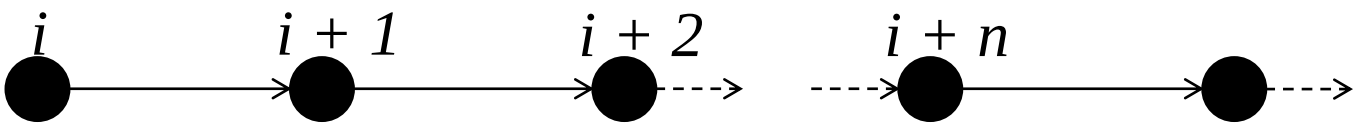
Example 3

□ (ϕ ∧ ψ)



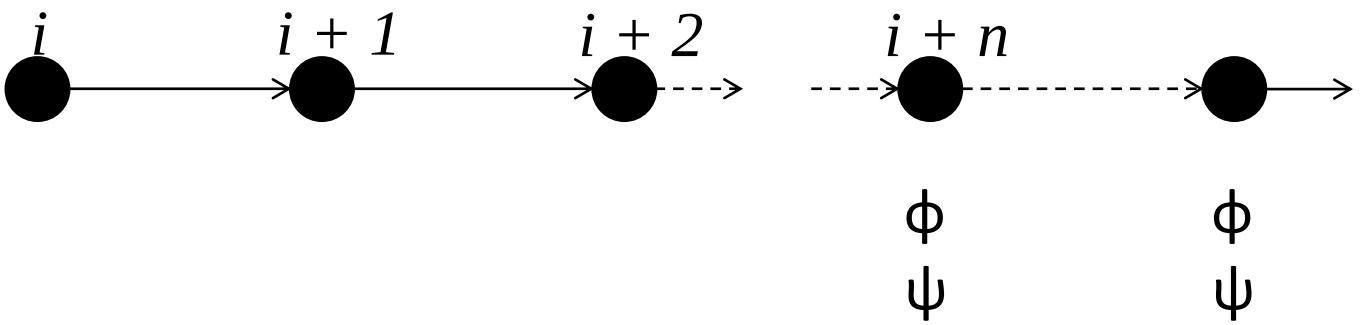
Example 4

□ (ϕ → ψ)



Example 4

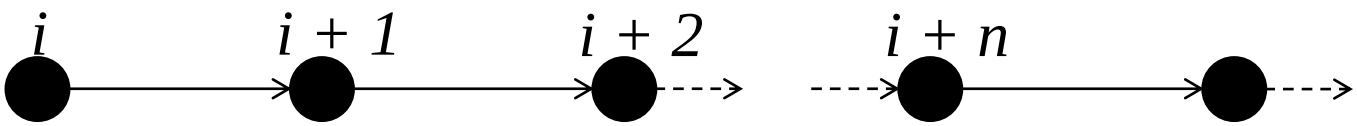
$\Box (\phi \rightarrow \psi)$



Note: It is always the case that <u>whenever</u> ϕ is true, then ψ will also be true at the same time.

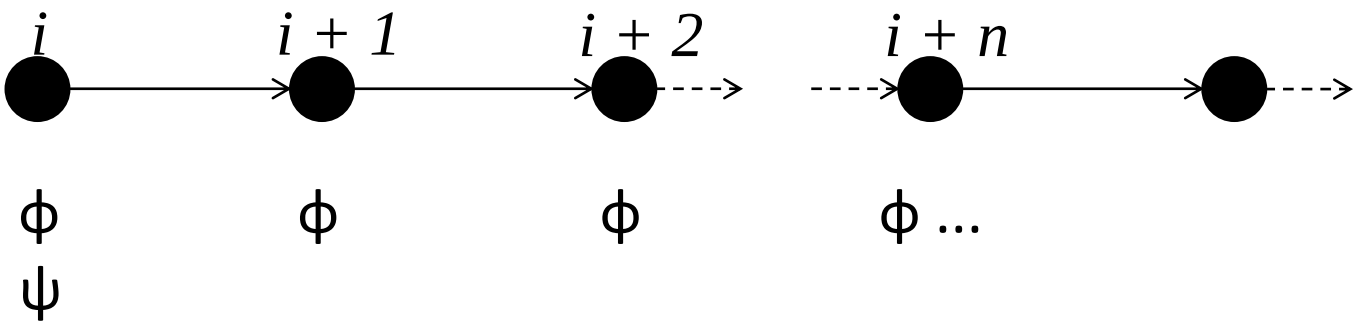
Example 5

$\Box \phi \rightarrow \psi$



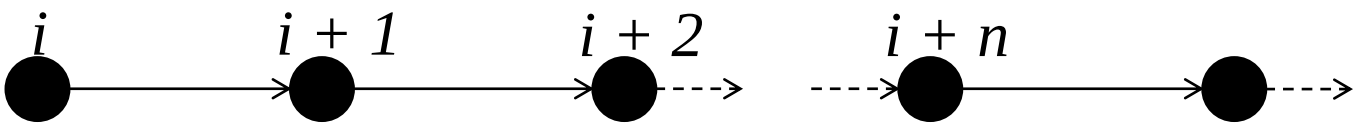
Example 5

$\Box \phi \rightarrow \psi$



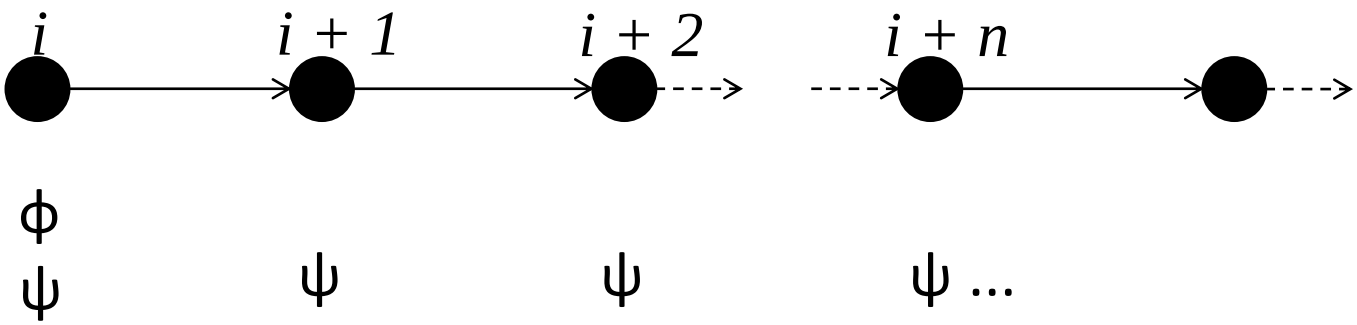
Example 6

$\phi \rightarrow \Box \psi$



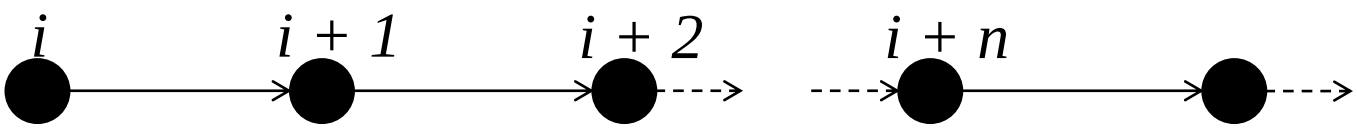
Example 6

$\phi \rightarrow \Box \psi$



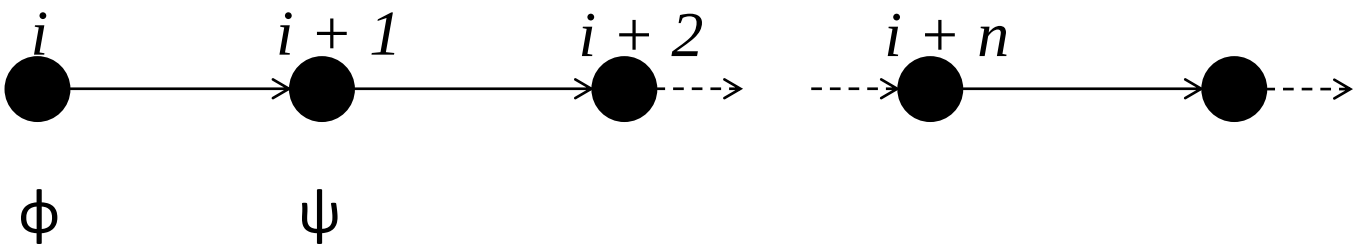
Example 7

$\phi \rightarrow \circ\, \psi$



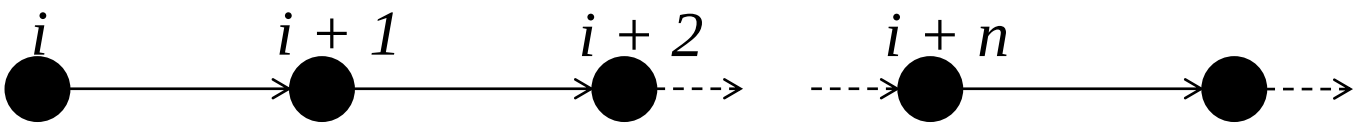
Example 7

$\phi \rightarrow \circ\, \psi$



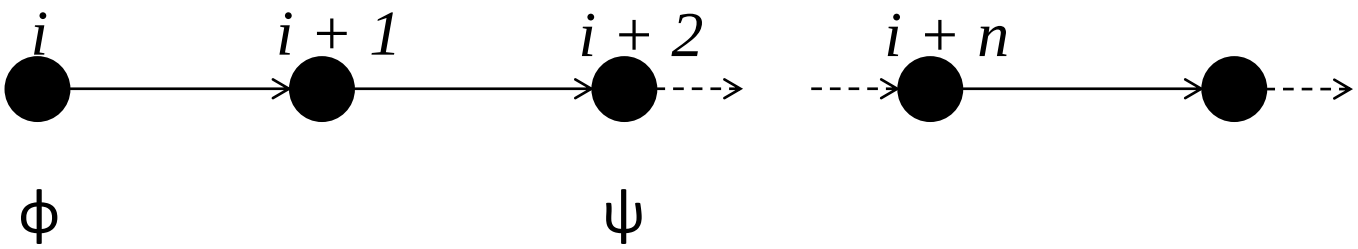
Example 8

$\phi \rightarrow O^2 \psi$



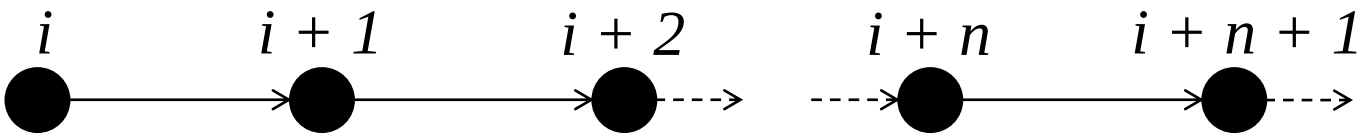
Example 8

$\phi \rightarrow O^2\ \psi$



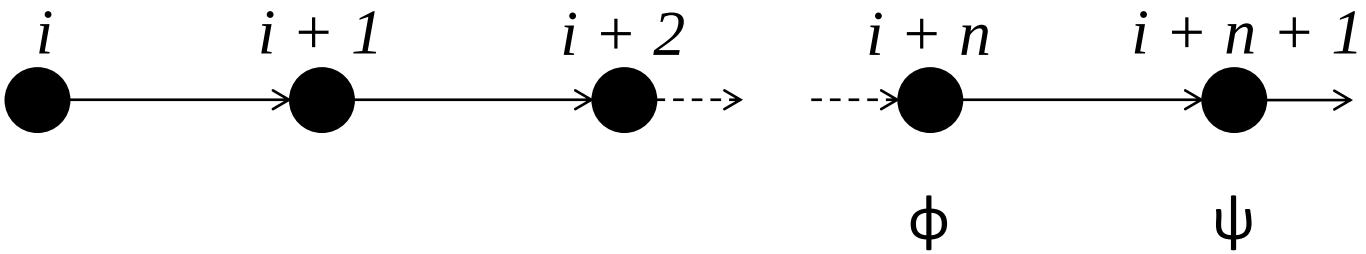
Example 9

$\Box(\phi \rightarrow \bigcirc \psi)$



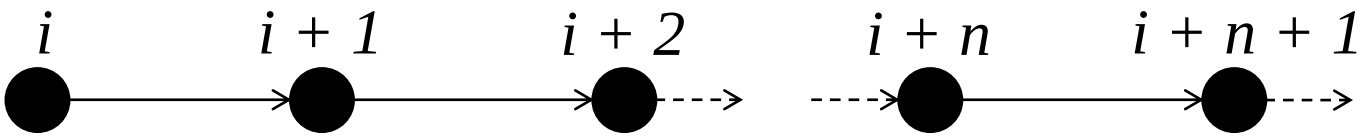
Example 9

□ (ϕ → ○ ψ)



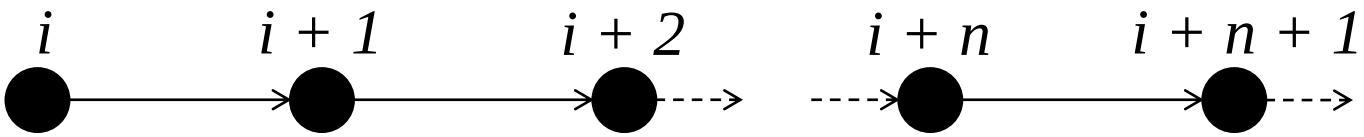
Example 10

$\phi \rightarrow \Diamond \psi$



Example 10

$\phi \rightarrow \Diamond \psi$

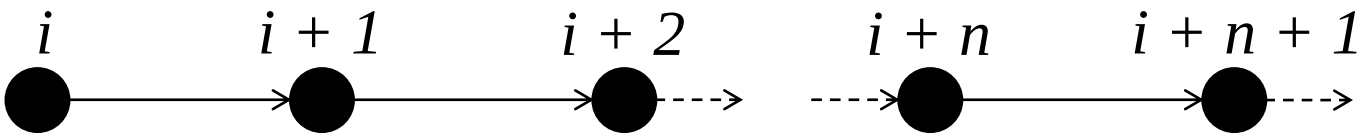


ϕ

ψ or ψ or ψ …or ψ …

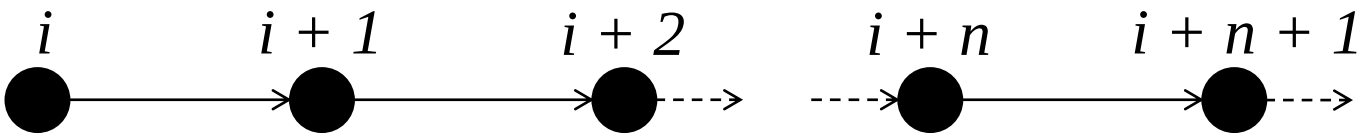
Example 11

$\phi \rightarrow \Diamond \Box \psi$



Example 11

$\phi \rightarrow \Diamond \Box \psi$



ϕ

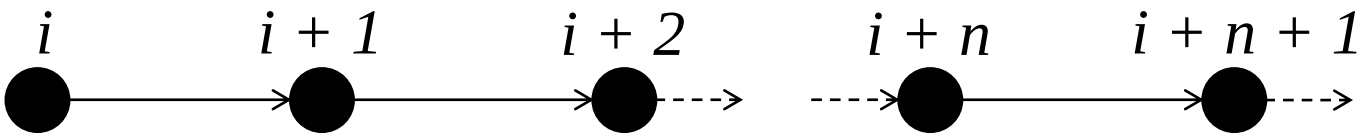
ψ ψ ψ ψ ...

or ψ ψ ψ ...

or ψ ψ ...

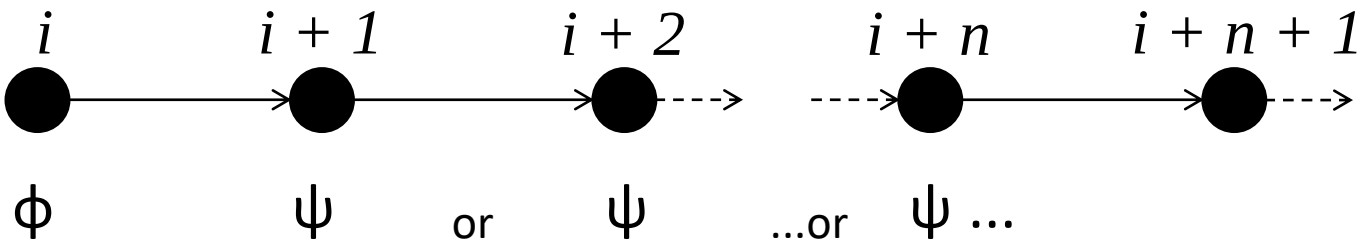
Example 12

$\phi \rightarrow \circ \Diamond \psi$



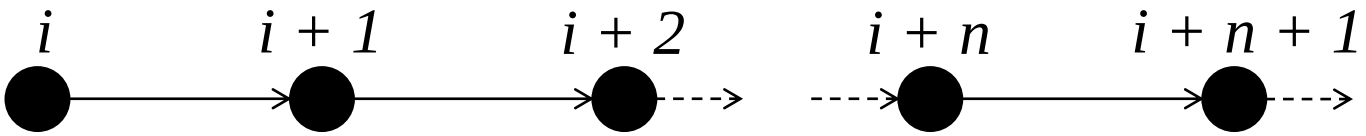
Example 12

$\phi \rightarrow \circ \Diamond \psi$



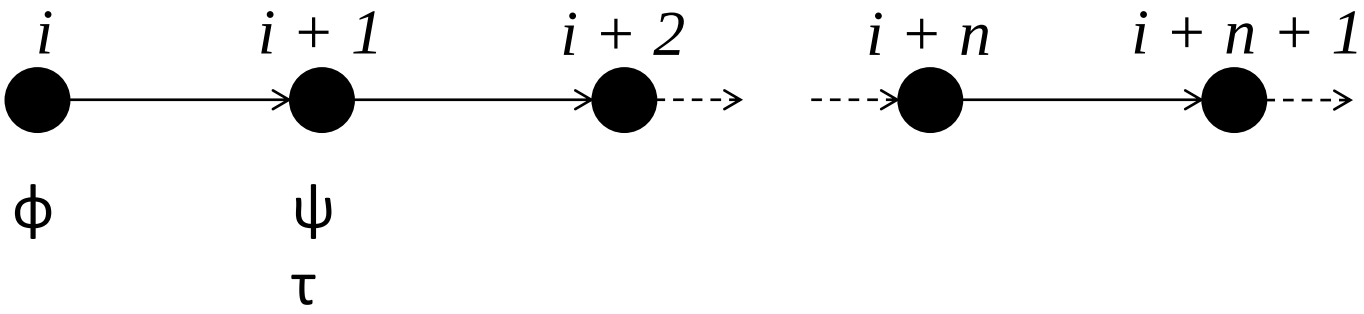
Example 13

$(\phi \wedge \circ \psi) \rightarrow \circ \tau$



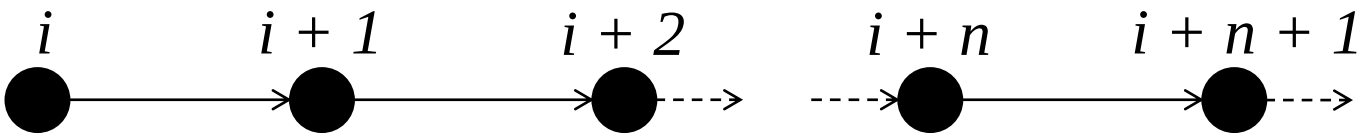
Example 13

$(\phi \wedge \circ \psi) \rightarrow \circ \tau$



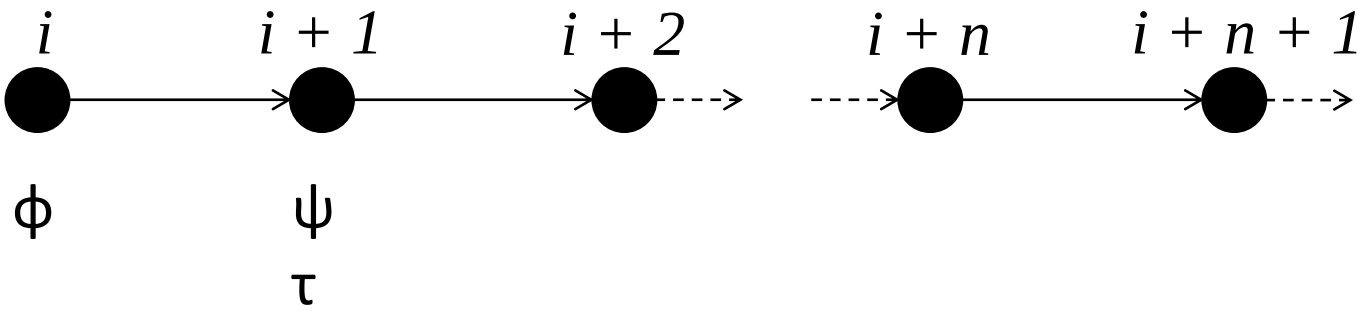
Example 14

$\phi \rightarrow \circ (\psi \wedge \tau)$



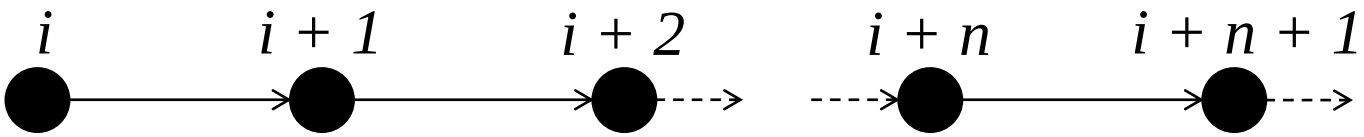
Example 14

$\phi \rightarrow \circ (\psi \wedge \tau)$



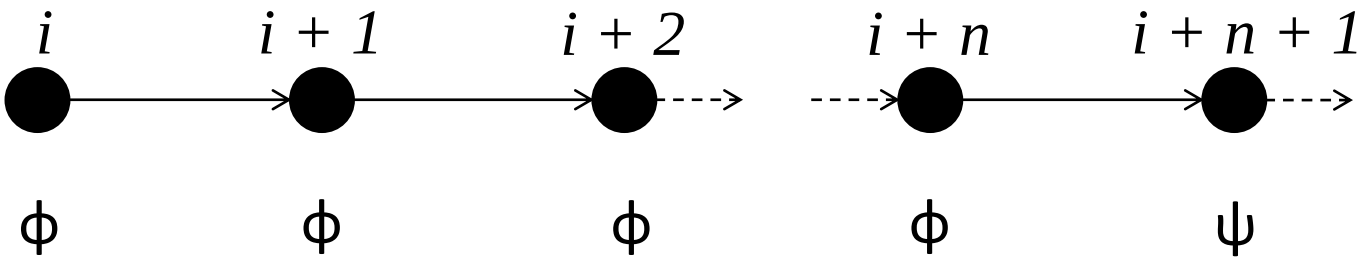
Example 15

$\phi \, U \, \psi$



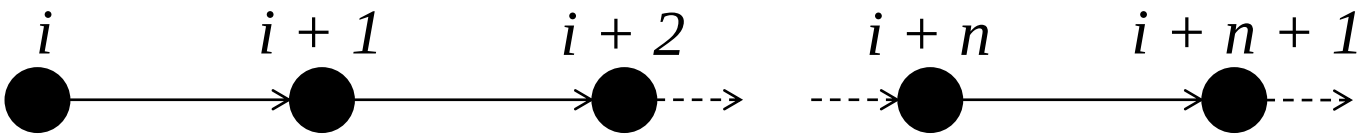
Example 15

$\phi \, U \, \psi$



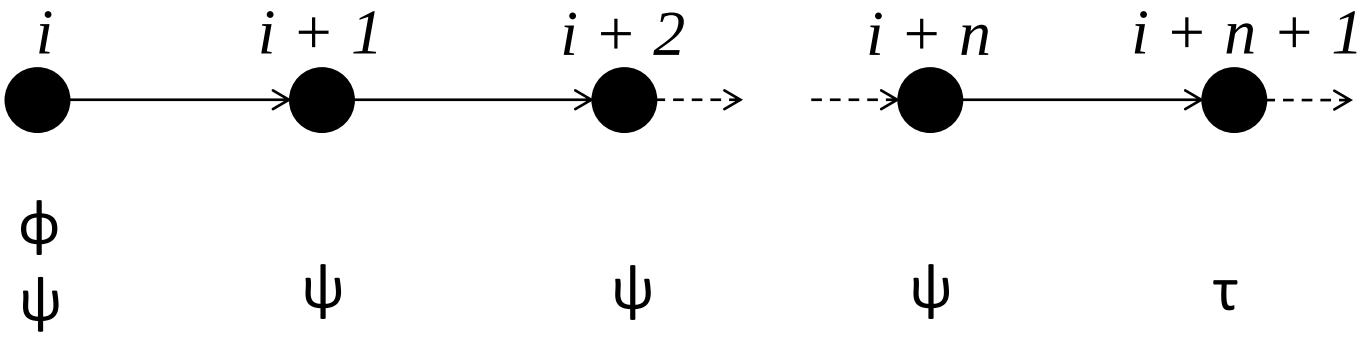
Example 16

$\phi \rightarrow (\psi \; U \; \tau)$



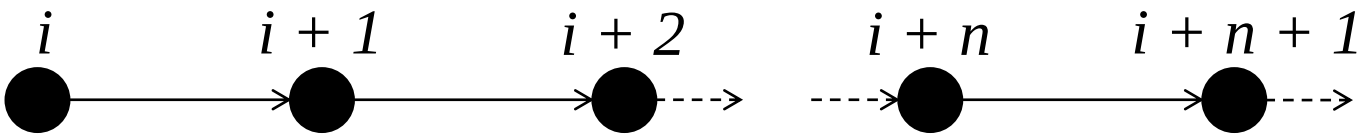
Example 16

$\phi \rightarrow (\psi \; U \; \tau)$



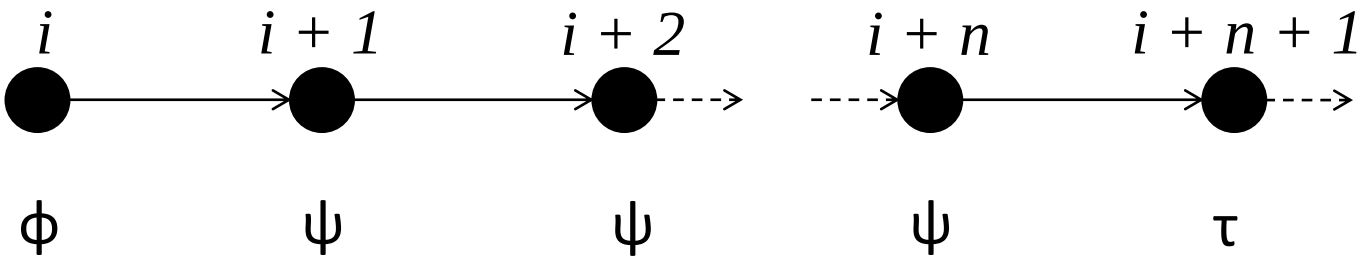
Example 17

$\phi \rightarrow \circ (\psi \mathcal{U} \tau)$



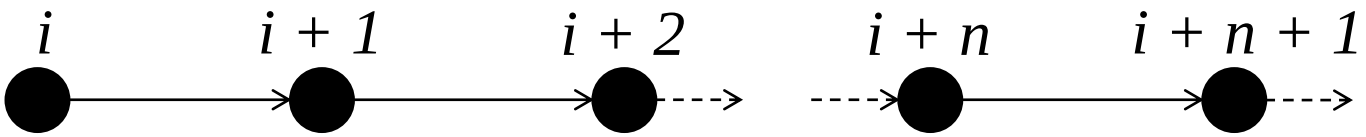
Example 17

$\phi \rightarrow \circ (\psi \mathcal{U} \tau)$



Example 18

ϕ R ψ



Example 18

ϕ R ψ