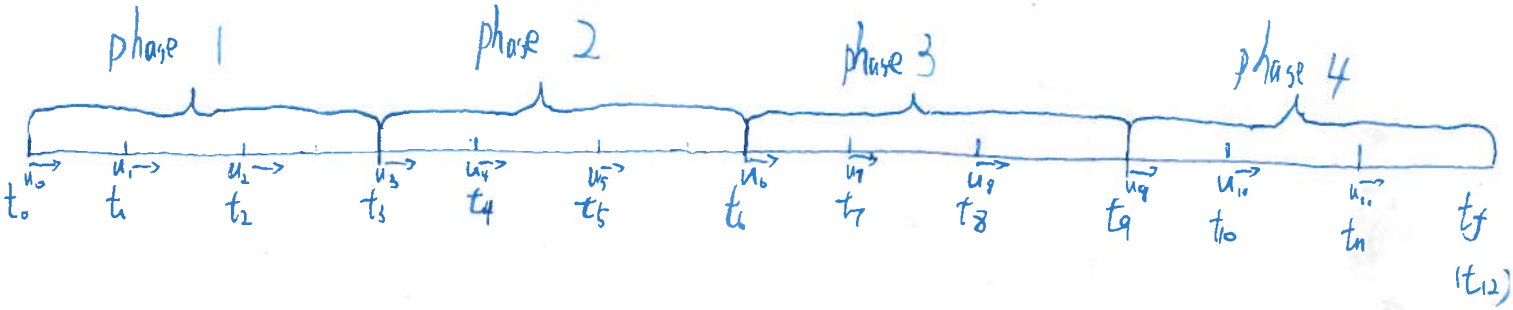
Time Step Grouping - Each Phase Has Fixed Number of Time Steps

For Euler Integration Only



Number of phases : 4

Number of time steps in a single phase : 3

$u_{0:2}$ ⇒ 3 control input are responsible for phase 1

$u_{3:5}$ ⇒ 3 control inputs are responsible for phase 2

$u_{6:8}$ ⇒ 3

$u_{9:11}$ ⇒ 4

① Similiarly, Footstep locations are grouped in the same way as the control input

② Mode selection variable governs the complementarity constraints of control inputs and footstep locations at corresponding phases.

③ How to identify which phases a particular timestep belongs to?

$$\text{phase Number} = \frac{\text{time step number}}{\text{Number of phases}} + 1 \quad \text{(Integer division)}$$

④ The terminal time step is not considered, although its control and foot steps are defined, since Euler Integration does not need them.