Runner Scenario

$$v_{runner} := 12 \ \frac{km}{hr}$$

$$l_{track} := 906.1739 \ m$$

$$t_{runner\_round} := \frac{l_{track}}{v_{runner}} = 4.531 \ min$$

$$p_{track\_frequence} := 4 \ Hz$$

$$p_{track\_time} := p_{track\_frequence}^{-1} = 250 \ ms$$

$$p_{track\_perRound} := \frac{l_{track}}{v_{runner}} \cdot p_{track\_frequence} = 1.087 \cdot 10^{3}$$

$$l_{marathon} := 42.195 \ km$$

$$rounds_{track} := \frac{l_{marathon}}{l_{track}} = 46.564$$

Train Setup

$t_{train\_round} := 15.5\ sec$

$l_{circle} := 43.5\ cm$ $l_{circle2} := 56\ cm$

$h_{circle} := 22\ cm$

$l_{train} := (l_{circle} - h_{circle}) \cdot 2 + h_{circle} \cdot \pi = 1.121\ m$

$v_{train} := \frac{l_{train}}{t_{train\_round}} = 4.34\ \frac{m}{min}$

$factor := 4$

$p_{train\_perRound} := \frac{p_{track\_perRound}}{factor} = 271.852$

$\left(\frac{p_{train\_perRound}}{t_{train\_round}}\right)^{-1} = 57.016\ ms$

$rounds_{train} := rounds_{track} \cdot factor = 186.256$

$rounds_{train} \cdot t_{train\_round} = 48.116\ min$