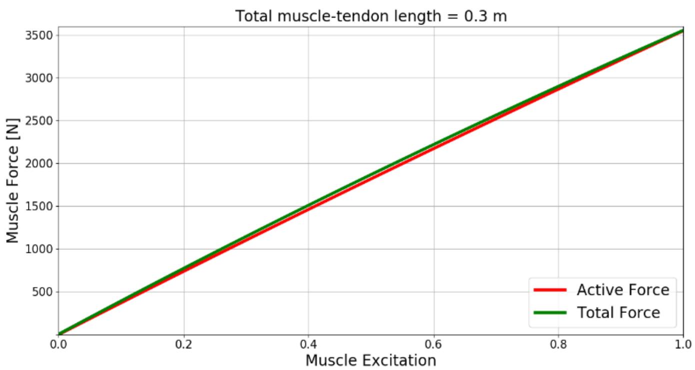
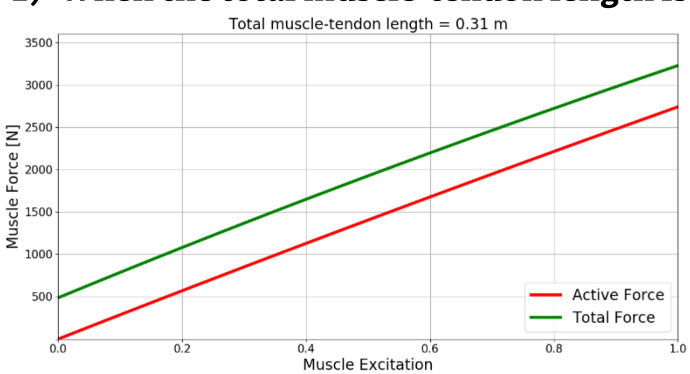
Programming Assignment Report

1) When the total muscle-tendon length is 0.30 m:



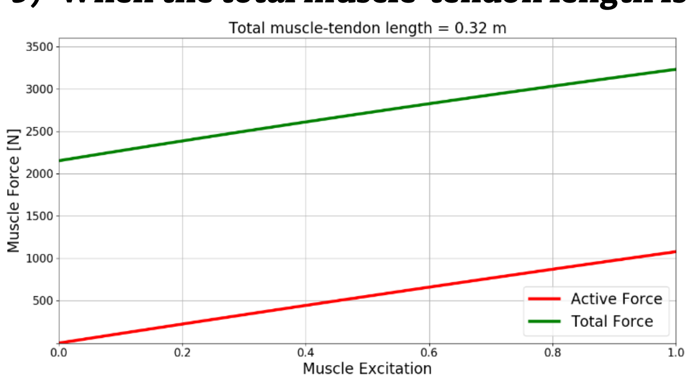
When $l_{mt} = 0.3\,m$, the calculated $\tilde{l}_m$ is 1.02. Therefore, the value of active and passive force-length functions could be achieved ($f_A(\tilde{l}_m) = 0.9997$ and $f_P(\tilde{l}_m) = 0.0015$). In this case, the contractile element dominates the contraction of the muscle as the generated active force is close to the total force.

2) When the total muscle-tendon length is 0.31 m:



When $l_{mt} = 0.31\,m$, the calculated $\tilde{l}_m$ is 1.22. Therefore, the value of active and passive force-length functions could be achieved ($f_A(\tilde{l}_m) = 0.7724$ and $f_P(\tilde{l}_m) = 0.1372$). In this case, the contractile element still contributes significantly to the contraction of the muscle while the passive element adds 500 N to the total force.

3) When the total muscle-tendon length is 0.32 m:



When $l_{mt} = 0.32\,m$, the calculated $\tilde{l}_m$ is 1.41. Therefore, the value of active and passive force-length functions could be achieved ($f_A(\tilde{l}_m) = 0.304$ and $f_P(\tilde{l}_m) = 0.6064$). In this case, the passive element plays a significant role in muscle contraction as over sixty percent of the total force stems from this component.