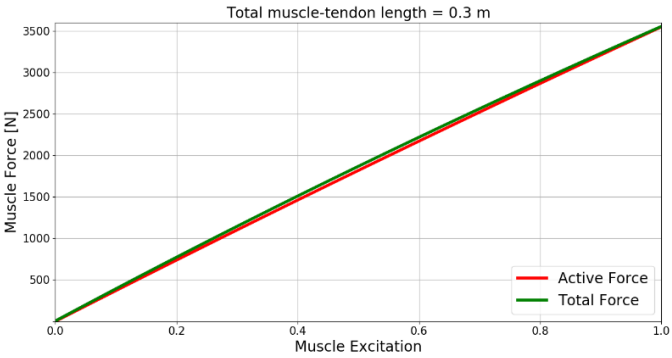
Programming Assignment Report

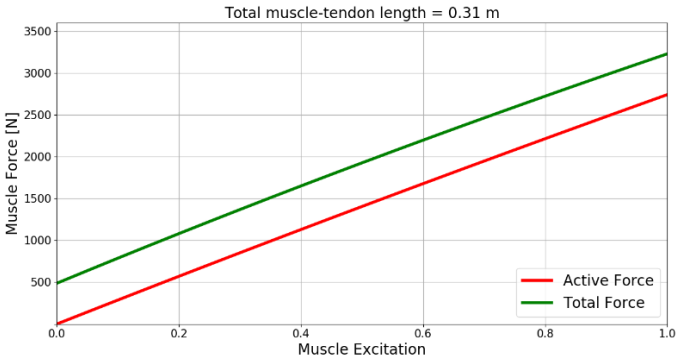
1) When the total muscle-tendon length is 0.30 m:



Here are the results after running the program: $\tilde{l}_m$ = 1.02, $f_A(\tilde{l}_m) = 0.9997$, and $f_P(\tilde{l}_m) = 0.0015$.

In this case, the muscle is at its optimal fiber length. It could be perceived that the contractile element dominates the muscle contraction as the generated active force is close to the total force.

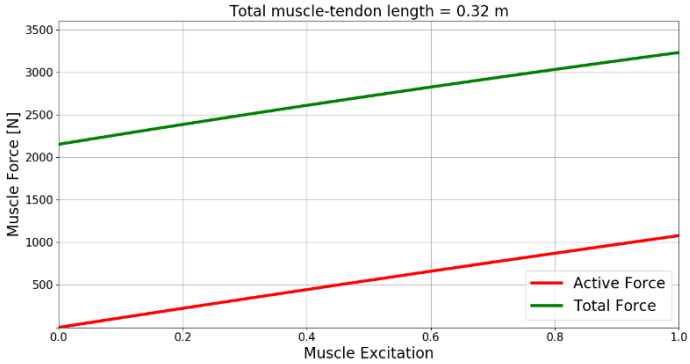
2) When the total muscle-tendon length is 0.31 m:



Here are the results after running the program: $\tilde{l}_m$ = 1.22, $f_A(\tilde{l}_m) = 0.7724$, and $f_P(\tilde{l}_m) = 0.1372$.

The contractile element still contributes significantly to the muscle contraction while the passive element begins to show its influence on the total force.

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



Here are the results after running the program: $\tilde{l}_m$ = 1.41, $f_A(\tilde{l}_m) = 0.3040$, and $f_P(\tilde{l}_m) = 0.6064$.

When the total muscle-tendon length is 0.32m, the muscle is stretched away from its optimal fiber length. In this state, the passive element plays a significant role in muscle contraction as over sixty percent of the total force stems from this component.