Example 4.8.2:

Comparison of various methods:

Time	Runge Kutta	Actual	Central
0	Column1	Column1	Column1
0.000213	0	0	0
0.001467	0.00021308	0.0002105	0
0.004191	0.0014674	0.0014674	0.0011914
0.007672	0.0041908	0.0041924	0.0045072
0.01017	0.0076724	0.0077195	0.0090595
0.010606	0.01017	0.010231	0.011752
0.00901	0.010606	0.010653	0.010932
0.006203	0.0090097	0.0090276	0.0073059
0.003162	0.0062029	0.0061932	0.0030782
0.000647	0.0031617	0.0031365	0.00017242
-0.00098	0.00064693	0.0006215	-0.000743
-0.00171	-0.00097634	-0.00099076	-0.00024613
-0.00168	-0.0017118	-0.0017192	0.00051138
-0.00112	-0.0016782	-0.0016766	0.00084408
-0.00036	-0.0011159	-0.0011075	0.0006498
0.000282	-0.00036308	-0.00035277	0.0001744
0.000644	0.0002819	0.00028937	-0.00025085
0.000692	0.00064415	0.00064653	-0.000417
0.000503	0.00069168	0.00068894	-0.00031343
0.000209	0.00050303	0.00049717	-0.000074998
-6.42E-05	0.00020916	0.00020295	0.00013226
-0.00024	-0.000064248	-0.000068331	0.0002081
-0.00028	-0.00023554	-0.00023661	0.00015147
-0.00022	-0.00028018	-0.00027836	0.000031633
-0.00011	-0.00022158	-0.0002182	-0.000069335
4.55E-06	-0.00010933	-0.00010593	-0.00010369

Displacement-Time Graph(Runge Kutta):
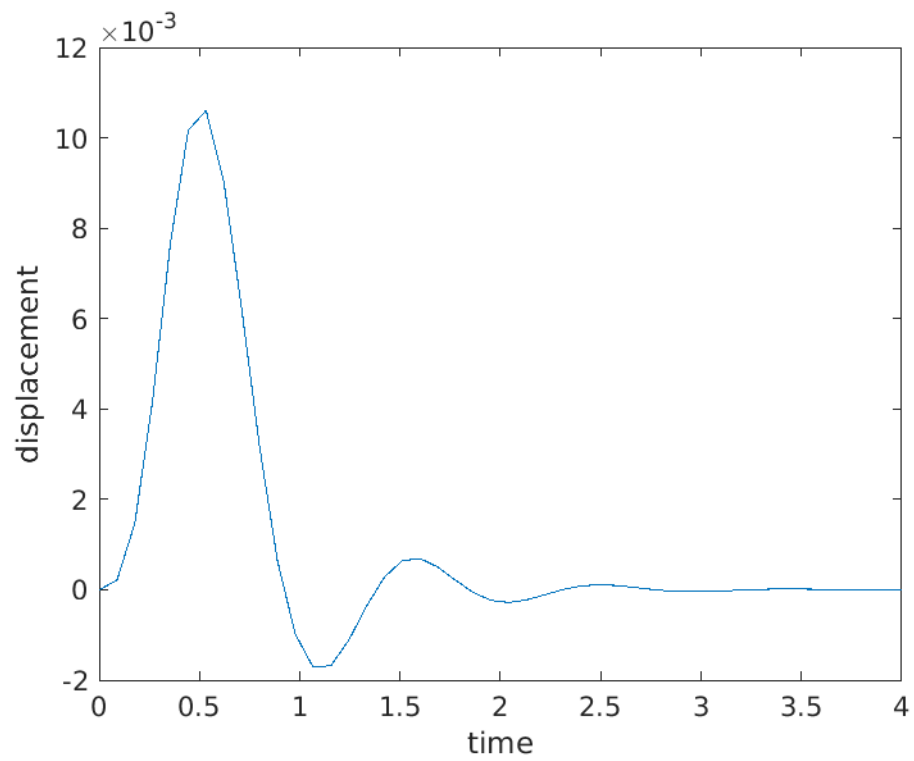
Velocity-Time Graph(Runge Kutta):