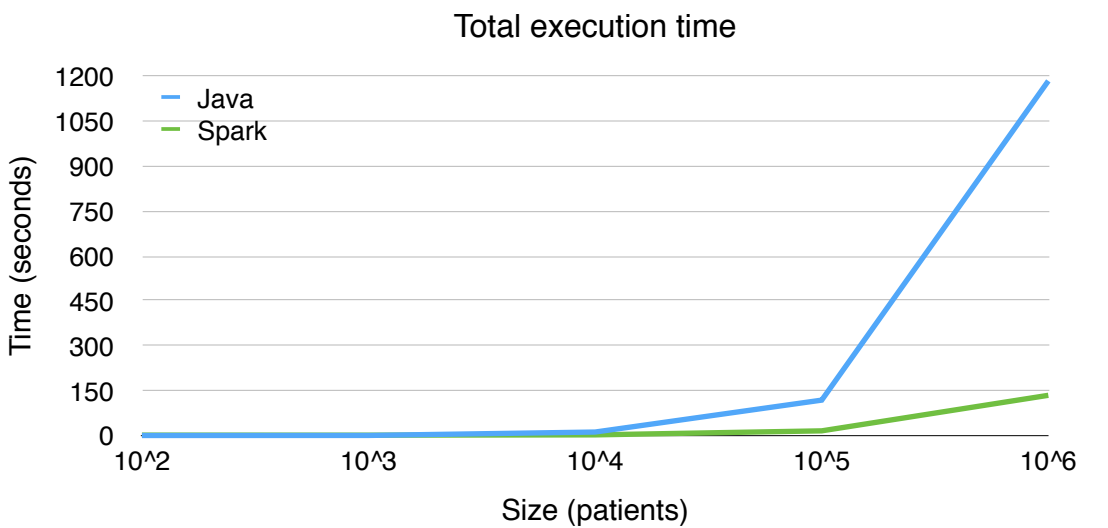
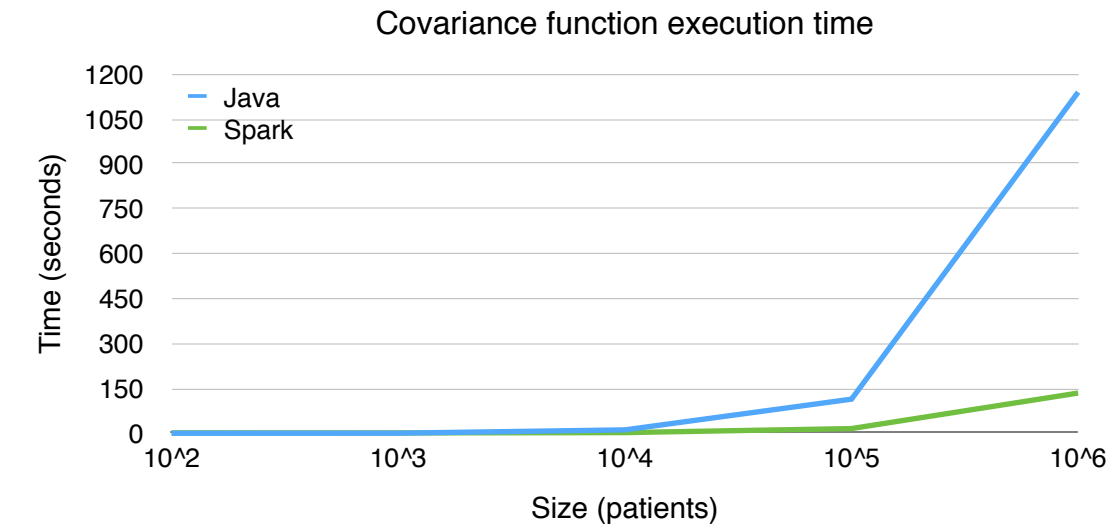


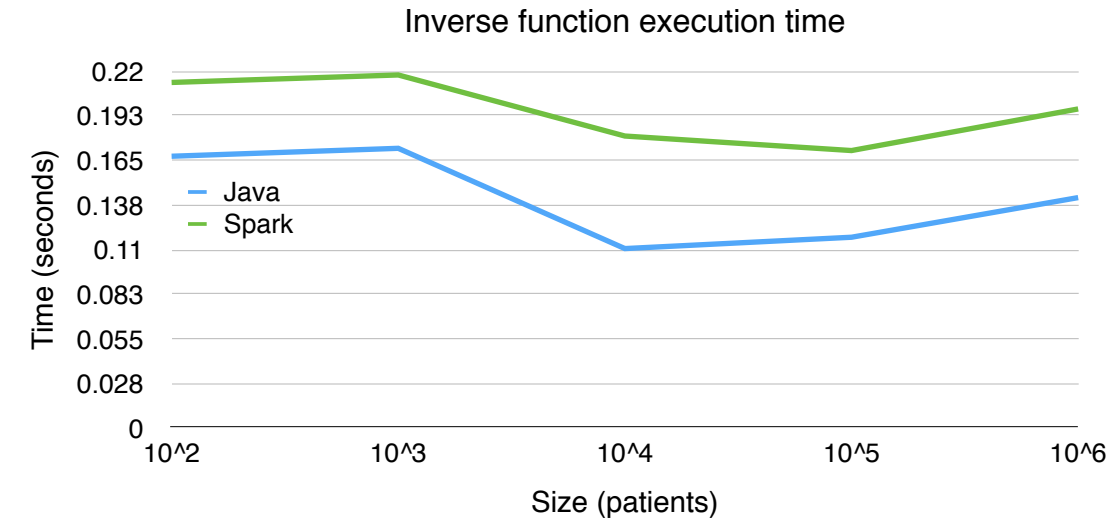
Total execution time*			
Java implementation		Spark implementation	
size (patients)	time (seconds)	size (patients)	time (seconds)
100	0.3318846	100	1.5710898338
1000	0.514674	1000	1.3960350826
10000	11.8823922	10000	2.4339014328
100000	118.4088122	100000	15.8688674616
1000000	** 1184.088122	1000000	134.50339402
*execution time of 3 operations only (covariance, inverse, and distance); does not include time to load data into memory			
**extrapolated value; true value unknown due to out of memory error			



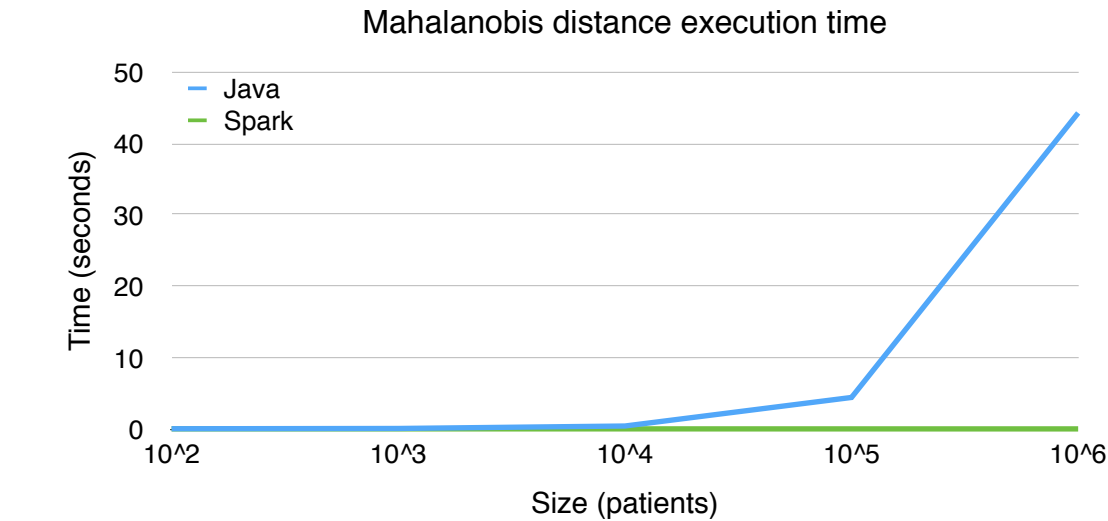
Covariance function execution time			
Java implementation		Spark implementation	
size (patients)	time (seconds)	size (patients)	time (seconds)
100	0.1208288	100	1.2889427904
1000	0.2590398	1000	1.1159151752
10000	11.3454168	10000	2.190062142
100000	113.8638048	100000	15.64893634
1000000	** 1138.638048	1000000	134.261679913



Inverse function execution time			
Java implementation		Spark implementation	
size (patients)	time (seconds)	size (patients)	time (seconds)
100	0.167464	100	0.212941896
1000	0.1723528	1000	0.2175572946
10000	0.1105632	10000	0.1799254996
100000	0.1175546	100000	0.170973995
1000000	** 0.14198365	1000000	0.1966173855



Mahalanobis distance execution time			
Java implemenation		Spark implementation	
size (patients)	time (seconds)	size (patients)	time (seconds)
100	0.0435896	100	0.0298630264
1000	0.0832778	1000	0.0256100306
10000	0.426409	10000	0.026573806
100000	4.42745	100000	0.0248115144
1000000	** 44.2745	1000000	0.0233099845



Experimental specifications	
Machine	MacBook Pro (Retina, 13-inch, Early 2015): Processor - 2.7 GHz dual-core Intel Core i5, Memory - 16 GB 1867 MHz DDR3, Storage - 2.7GHz 128GB PCIe-based flash storage
Java	Java 1.7, -Xmx6g
Spark	Spark 1.5.1, local mode, spark.driver.memory 5g