

**S1 Table. The PEPIS running time for computing main effect kinship matrix (Ka, Kd) and full polygenic kinship matrix using the simulated data at various numbers of bins and individuals.**

**A. Fixing the number of Individuals at 1,000 while varying the numbers of bins from 1,000 to 40,000.**

		Running time (seconds) for computing	
		Ka, Kd	Ka, Kd, Kaa, Kad, Kda, Kdd
Individual=1,000	Bin=1,000	87	66
	Bin=2,000	88	146
	Bin=4,000	95	345
	Bin=1,0000	322	2,056
	Bin=20,000	419	7,262
	Bin=40,000	545	29,322

**B. Fixing the numbers of bins at 1,000 while varying the numbers of individuals from 1,000 to 40,000.**

		Running time (seconds) for computing	
		Ka, Kd	Ka, Kd, Kaa, Kad, Kda, Kdd
Bin=1,000	Individual=1,000	57	63
	Individual=2,000	70	130
	Individual=4,000	158	427
	Individual=10,000	739	2,453
	Individual=20,000	2,763	9,710
	Individual=40,000	1,1131	39,024