

For the first problem, I modified the codes as “get\_data\_modified.c” and it worked on machine.

For the second problem, I wrote a program called “gauss\_mpi.c” and compiled it to object file “gauss\_mpi.o” and built an executable file “gauss\_mpi”. I did test on 1, 2, 4, 8, 12 and 16 processes for a 2000\*2000 matrix. As the results below shows, parallel programs have significant speedup for serial one. But the differences between parallel programs of different number of processes are trivial. Generally speaking, the efficiency grows with the increasing of the number of processes. However, there is a severe drawback observed while applying 8 processes. I guess it could be related to the machine structure and capacity. As we know, each node has 8 cores so that it may have some effects on it.

# Processes	Elapsed Time (s)	Speedup
1	19.360823	
2	13.834875	1.3994
4	13.268457	1.4592
8	18.509882	1.0460
12	13.679470	1.4153
16	12.293589	1.5749