

Group report of Steady State Temperature Distribution Problem

Wenbo Dong, Yiting Wang

7 December, 2016

Brief Report for The Final Program

1 The execution time for serial and parallel version program

We run the program in herschel and make the following table:

Time	Serial version(seconds)	Parallel version(seconds)
1	45.9449997	14.4870005
2	45.9570007	14.4169998
3	46.0369987	14.4519997
Mean	45.9796664	14.4520000

2 Simple conclusions for the programming result

- The serial version take much more time to run it.
- The average temperature for the non-heating cells when it becomes steady is 55.0627365 degree.
- The number of iterations to arrive at steady state is 6485.(The count number minus 2. Since it including the first state and the final steady state)

3 Instructions to the code

1. serial.f90 program: This is the code for serial version. And we use this one to generate the final data and animation.

2. parallel.f90 program: This is the code for parallel version.
3. hotPlate.gp & combine.gp: we use these two code to make the animations by using Gnuplot.
 - First we generate the data files from hotPlate0000.csv to hotPlate.0064.csv by using command “gfortran serial.f90” and “./a.out”.
 - Then we generate hotPlate0000.gif to hotPlate0064.gif by using command “gunplot combine.gp”
 - Finally we generate movie.gif by using commands “convert -dispose previous -delay 10 hotPlate00*.gif -loop 1 movie.gif”

4 Final result

We package the two .f90 files, two .gp files, two report(Group report and individual report) and animation(movie.gif). And submit it to D2L.