Assignment 5. Parallelize the force calculation for n particles so that the computation loads on all processes are balanced, and communication cost has a complexity of O(n log_2 p) for n particles and p processors.

Due: Nov 16 before midnight

```
#define sgn(x)      ( ((x)<0.0) ? (-1.0) : (1.0) )
#define c1          1.23456
#define c2          6.54321
#define n      123456

/* Input: n, x[n]. Note that x[i] \not= x[j] for different i, j.
   Output: f[n].
*/
void calc_force(int n, double *x, double *f)
{
   int i,j;
   double diff, tmp;
   for(i=0; i<n; i++) f[i] = 0.0;

   for(i=1; i<n; i++)
      for(j=0; j<i; j++) {
      diff = x[i] - x[j] ;
         tmp = c1/(diff*diff*diff) - c2*sgn(diff)/(diff*diff) ;
         f[i] += tmp;
         f[j] -= tmp;
      }
}
```