**Parallel Computing, Cloud Computing, and Big Data**

**Homework-1**

**1.**(3 points) Practice debugging MPI programs. Please fix the bugs in the three attached MPI programs. Submit your correct solution and briefly summarize what the problems are.

具体的修改在代码里，错误原因在代码注释中

**2. (4 points)** For each of the following code segments, use OpenMP pragmas to make the loop parallel, or explain why the code segment is not suitable for parallel execution. You do not need to write executable C programs, please just add valid openMP pragmas. The code can be modified with keeping the same semantics for adding openMP pragmas.  
**(1)**#pragma omp parallel for  
for (i=0;i<(int)sqrt(x);i++){

    a[i] = 2.3 \* i;

    if (i<10) b[i] = a[i];

}

**(2)**

flag = 0;

#pragma omp parallel for

for (i=0; (i<n) && (!flag); i++){

   a[i] = 2.3\*i;

#pragma omp critical

   if (a[i] < b[i]) flag = 1;

}

**(3)**

#pragma omp parallel for

for (i=0; i<n; i++)

   a[i] = foo(i);

**(4)**

#pragma omp parallel for

for (i=0; i<n; i++){

    a[i] = foo(i);

    if (a[i] < b[i]) a[i] = b[i];

}

**(5)**

不可以使用并行，不规范，如果在一个Thread中break了其他线程不知道还在处理，这样写是错误的

for (i=0; i<n; i++){

    a[i] = foo(i);

    if (a[i] < b[i]) break;

}

**(6)**

p = 0;

#pragma omp parallel for reduction(+:p)

for (i=0; i<n; i++){

    p += a[i] \* b[i];

}

**(7)**

#pragma omp parallel for

for (i=k; i<2\*k; i++){

    a[i] = a[i] + a[i-k];

}

**(8)**

不可以使用，并行后当i>=2k后a[i-k]会变化，各种乱就对了

for (i=k; i<n; i++){

    a[i] = b \* a[i-k];

}