CS 5379 Assignment 3

Due: before midnight of Oct 12, 2023

Parallelize the following sequential code by parallelizing the two for-loops indicated.

```
/*****************************************************************
 Input:  n and edge[n][n], where n is the number of vertices of a graph
         edge[i][j] is the length of the edge from vertex i to vertex j
 Output: distance[n], the distance from the SOURCE vertex to vertex i.
 *****************************************************************/
void HW3(int SOURCE, int n, int **edge, int *distance) {
  int i, j, count, tmp, least, leastPos, *found;

  found = (int *) calloc( n, sizeof(int) );
  for(i=0; i<n; i++) {
    found[i]= 0;
    distance[i] = edge[SOURCE][i];
  }
  found[SOURCE] = 1 ;
  count = 1 ;

  while( count < n ) {
    least = 987654321 ;
    for(i=0; i<n; i++) { // <-- parallelize this loop
      tmp = distance[i] ;
      if( (!found[i]) && (tmp < least) ) {
        least = tmp ;
        leastPos = i ;
      }
    }

    found[leastPos] = 1;
    count++ ;
    for(i=0; i<n; i++) { // <-- parallelize this loop
      if( !(found[i]) )
         distance[i] = min(distance[i], least+edge[leastPos][i]);
    }
  } /*** End of while ***/

  free(found) ;
}
```