ASSIGNMENT

BSCS__01

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SUBMITTED TO: **MAM ASIA**

SEC: **B**

EXPLANATION AND DESCRIPTION OF CODE:

CONCEPT OF THREADING AND PARALLELISM:

The programe begins by including the required header files and defining a constant called MAX THREAD that controls how many threads will be used for each task. The array's size is then declared as a global variable, size, and a global pointer, arr, to the array itself.

The merge sort algorithm has a helper function called merge (). By comparing the elements and switching them if necessary, it takes the left and right indices of the subarray that needs to be combined and sorts them in ascending order.

The merge sort algorithm is implemented recursively by the merge Sort() function. It determines whether the subarray has more than one element if the left index is less than the right index. If so, it determines the subarray's middle index and calls merge Sort () on both the left and right halves.

THREADING AND PARALLELISM:

Typically, "threading" refers to the simultaneous operation of multiple processes on a single CPU (well actually not you think they do but they switch very fast between them). Having multiple processes running simultaneously on various CPUs is known as parallelism. Each thread in a shared-memory multiprocessor environment multithreaded process can run concurrently on a different processor, resulting in parallel execution.

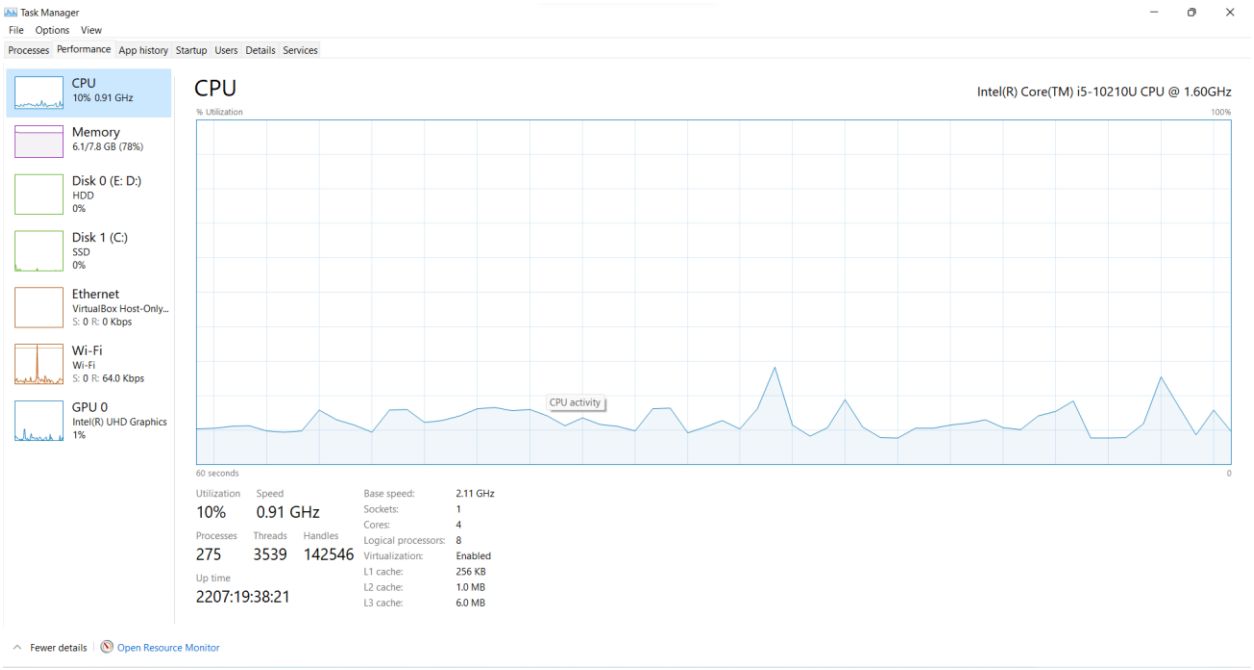
In order to combine the two sorted halves, it then calls the merge () function. Each thread will use the thread merge sort () function to perform its operations.It determines the portion of the array that the thread is in charge of sorting, then uses that portion to call the merge Sort () function.The programe asks the user to input the array's size and elements in the main() function.

The threads are then stored in an array of pthread t variables, and MAX THREAD threads are created, each of which executes the thread merge sort() function while receiving as an argument a pointer to the start index of its own portion of the array. The merge() function is then used to combine the two sorted halves of

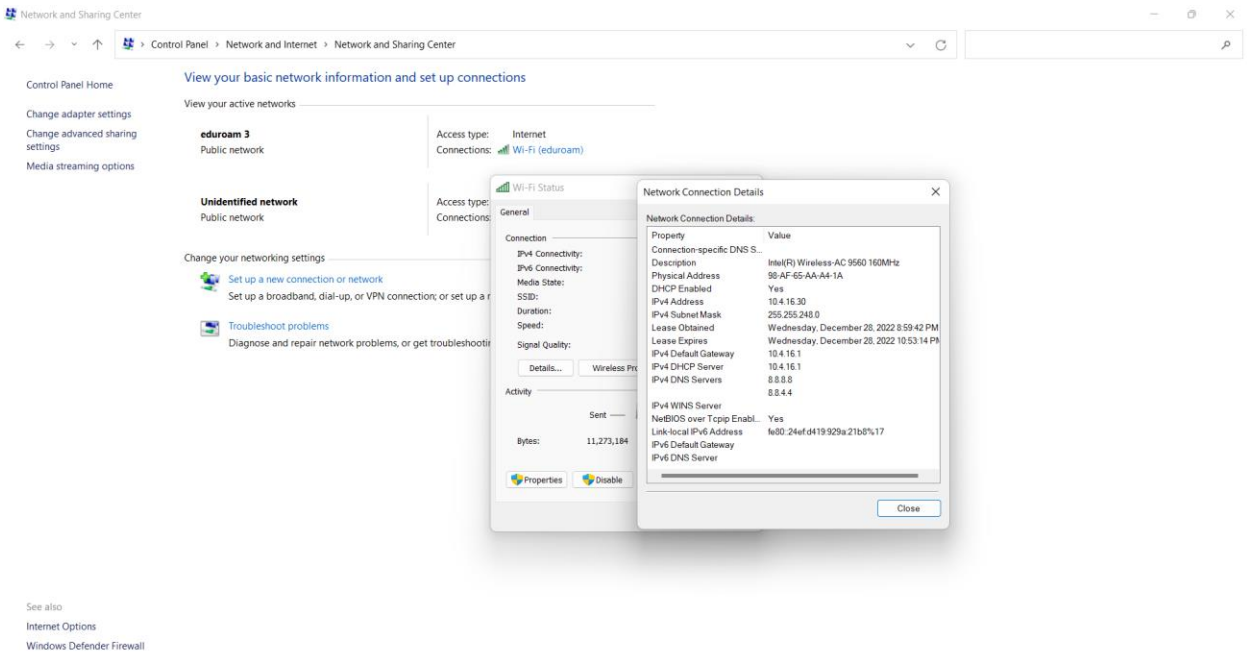
the array after the programe uses pthread join() to wait until all threads have finished. Finally, the sorted array is printed.

SCREENSHOTS

CORE OF THE SYSTEM:



ADDRESS OF THE DEVICE:



LINKS:

MERGE SORT SOURCE LINK:

https://www.geeksforgeeks.org/merge-sort/

GITHUB LINK:

https://github.com/HamaadSahi