OPERATING SYSTEMS ASSIGNMENT #3

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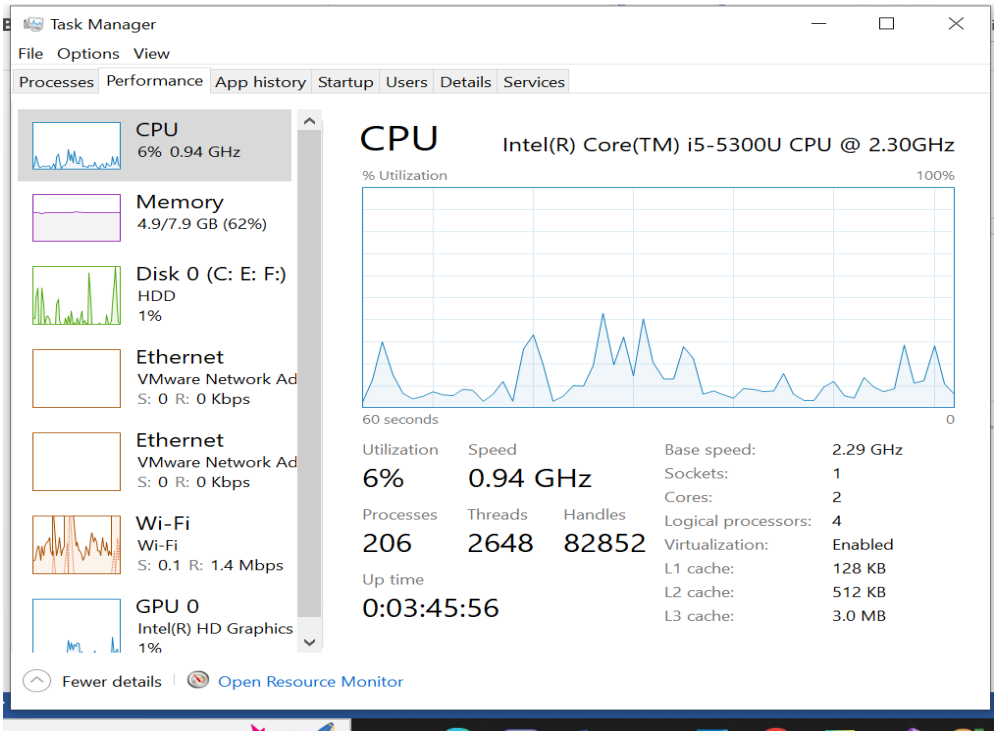
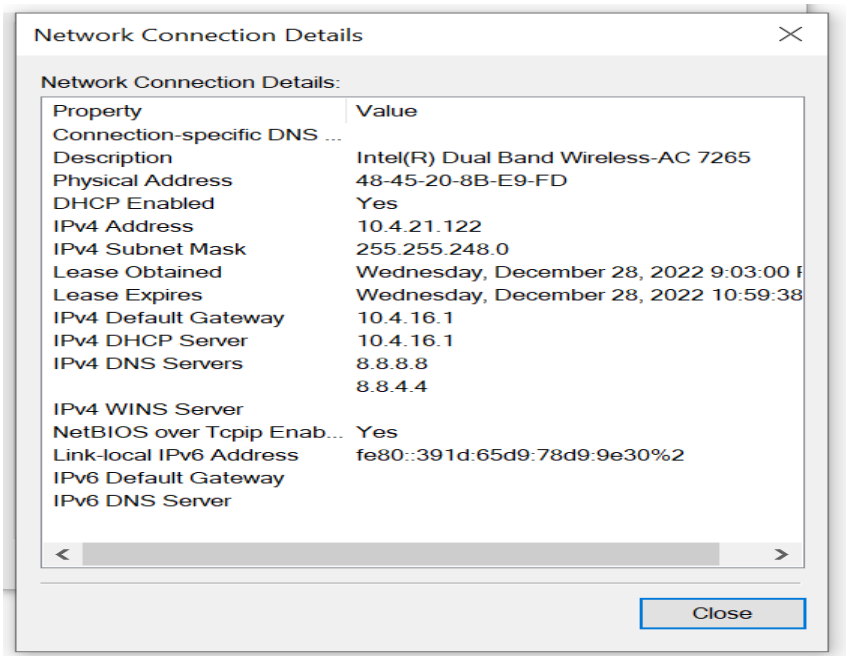
SYSTEM CORES: 2



MAC ADDRESS:



CODE:

```
import threading


def merge(arr, l, m, r):
    # Find sizes of two subarrays to be merged
    n1 = m - l + 1
    n2 = r - m

    # Create temp arrays
    L = [0] * n1
    M = [0] * n2

    # Copy data to temp arrays L[] and M[]
    for i in range(0, n1):
        L[i] = arr[l + i]

    for j in range(0, n2):
        M[j] = arr[m + 1 + j]

    # Merge the temp arrays back into arr[l..r]
    i = 0  # Initial index of first subarray
    j = 0  # Initial index of second subarray
    k = l  # Initial index of merged subarray

    while i < n1 and j < n2:
        if L[i] <= M[j]:
            arr[k] = L[i]
            i += 1
        else:
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            arr[k] = M[j]
            j += 1
        k += 1

    # Copy remaining elements of L[], if there are any
    while i < n1:
        arr[k] = L[i]
        i += 1
        k += 1

    # Copy remaining elements of M[], if there are any
    while j < n2:
        arr[k] = M[j]
        j += 1
        k += 1

def merge_sort(arr, l, r):
    if l < r:
        # Find the middle point
        m = (l + (r - 1)) // 2

        # Sort first and second halves
        t1 = threading.Thread(target=merge_sort, args=(arr, l, m))
        t2 = threading.Thread(target=merge_sort, args=(arr, m + 1, r))

        # Wait for the threads to finish
        t1.start()
        t2.start()
        t1.join()
```

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        t2.join()

        # Merge the sorted halves
        merge(arr, l, m, r)

arr = [5, 4, 7, 1, 3, 2, 6]

merge_sort(arr, 0, len(arr) - 1)

# Print the sorted array
print(arr)
```

Github Link:

https://github.com/ABDULHADI44