DATE:06/06/2005

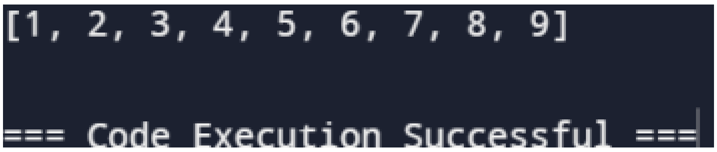
18. . Given an array of integers nums, sort the array in ascending order and return it.You must solve the problem without using any built-in functions in O(nlog(n)) time complexity and with the smallest space complexity possible.

AIM: To find. Given an array of integers nums, sort the array in ascending order and return it.You must solve the problem without using any built-in functions in O(nlog(n)) time complexity and with the smallest space complexity possible.

CODE:

```
def merge_sort(nums):
 if len(nums) <= 1:
 return nums
 mid = len(nums) // 2
 left_half = nums[:mid]
 right_half = nums[mid:]
 left_half = merge_sort(left_half)
 right_half = merge_sort(right_half)
 sorted_nums = merge(left_half, right_half)
 return sorted_nums
def merge(left, right):
 merged = []
 i = j = 0
 while i < len(left) and j < len(right):
 if left[i] < right[j]:
 merged.append(left[i])
 i += 1
 else:
 merged.append(right[j])
 j += 1
 merged.extend(left[i:])
 merged.extend(right[j:])
 return merged
nums = [5, 2, 9, 3, 7, 1, 8, 6, 4]
sorted_nums = merge_sort(nums)
print(sorted_nums)
```

OUTPUT:



```
[1, 2, 3, 4, 5, 6, 7, 8, 9]


=== Code Execution Successful ===
```

TIME COMPLEXITY: -O(n log n)