C++ Assignment Solutions | Merge Sort | Week 12

1. Given an array of integers, sort it in descending order using merge sort algorithm.

   Code:

```
#include<bits/stdc++.h>
using namespace std;


void merge(std::vector<int> &a, int low, int mid, int high) {
    std::vector<int> b;

    int i = low;
    int j = mid + 1;

    while (i <= mid && j <= high) {
        if (a[i] > a[j]) b.push_back(a[i++]);
        else b.push_back(a[j++]);
    }

    while (i <= mid) {
        b.push_back(a[i++]);
    }

    while (j <= high) {
        b.push_back(a[j++]);
    }
```

2. Reverse Pairs (Leetcode Problem) : Given an integer array nums, return the number of reverse pairs in the array.

   A reverse pair is a pair (i, j) where:

   0 <= i < j < nums.length and

   nums[i] > 2 * nums[j].

   Code:

```cpp
class Solution {
public:
    int ans = 0;
    void merge(vector<int> &a, int low, int mid, int high) {
        int i = low, j = mid+1;

        while(i <= mid && j <= high) {
            if((long long)a[i] > (long long)2*a[j]) {
                ans += mid - i + 1;
                j++;
            } else {
                i++;
            }
        }

        i = low, j = mid+1;

        vector<int> b;

        while(i <= mid && j <= high) {
            if(a[i] < a[j]) b.push_back(a[i++]);
            else b.push_back(a[j++]);
        }
```

Note:- Please try to invest time doing the assignments which are necessary to build a strong foundation. Do not directly Copy Paste using Google or ChatGPT. Please use your brain😀.
