2021-10-28

> Today Learned:
>
> Introduction of Algorithms lecture 1
> (Corresponding to the first and second chapters of the book)
>
> Today Exercise:
>
> Merge-Sort(From AOAPC II Page225-226)

Source Code:

```
// merge_sort.c
// author: Rujia Liu, Jerry Zhang (completing the code)

#include <stdio.h>
void merge_sort(int* A, int x, int y, int* T);

int main()
{
    int A[10] = { 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 };
    int T[10] = { 0 };
    merge_sort(A, 0, 10, T);
    for (int i = 0; i < 10; i++) printf("%d ", A[i]);
    printf("\n");
    return 0;
}

void merge_sort(int* A, int x, int y, int* T)
{
    if (y-x > 1) {
        int m = x + (y-x) / 2;
        int p = x;  // starting index
        int q = m;  // middle index
        int i = x;  // counter
        merge_sort(A, x, m, T);
        merge_sort(A, m, y, T);
        while (p < m || q < y) {
            if (q ≥ y || (p < m && A[p] ≤ A[q])) {
                T[i++] = A[p++];
            }
            else {
```

```
                T[i++] = A[q++];
            }
        }
        for (i = x; i < y; i++) { A[i] = T[i]; }
    }
}
```

Coding Notes: