

Solve the problem below. You have 25 minutes. After you are done, rename the file containing your source code as your student ID (so, if your student ID is 2005001, the name of your file should be 2005001.c). Then submit that file to Moodle. Make sure you submit a file containing source code. Failure to follow these instructions will result in penalties.

Problem

Write a function `int merge(int a, int b)` that takes two non-negative integers `a` and `b` with non-decreasing digits and outputs the integer obtained by interweaving the digits of `a` and `b` in a non-decreasing manner. Examples are provided below.

```
int merge(int a, int b)
{
    /* takes two non-negative integers a and b with non-decreasing digits
       and returns the integer obtained by interweaving the digits of a and b
       in a non-decreasing manner.

       merge(1139, 2567) should return 11235679.
       merge(1234, 0) should return 1234.
       merge(123, 345) should return 123345.
    */
}
```

You must use recursion to implement this function. In particular, your function can not contain the keywords `for` or `while` in its body.