Multiply Strings

This problem is requiring manual multiplication without converting to integer (to handle large numbers).

Key Idea:
Grade School Multiplication:

1. Multiply each digit of num1 by each digit of num2.
2. Store intermediate results in an array product of size m+n (max possible length)
3. Handle carry while populating the array
4. Convert the array to string and remove leading zeros.

Steps:

1. Reverse iteration: multiply num1[i] * num2[j].
2. Add product to product[i+j+1] (lowest position for that digit)
3. Carry handling:
   product[i+j+1] += digit product
   product[i+j] += product[i+j+1] / 10
   product[i+j+1] %= 10
4. Skip leading zeros when converting to string.

Complexity:

- Time: O(m×n) - nested loops for multiplication
- Space: O(m+n) - for result array.