

Assignment One - Programming

Problem

Return all non-negative integers of length n such that the absolute difference between every two consecutive digits is k . Note that every number in the answer must not have leading zeros. For example, 01 has one leading zero and is invalid. **You should return the answer in order.**

Test Cases

Function Test:

case 1

Input: $n = 2, k = 1$

Output: [10,12,21,23,32,34,43,45,54,56,65,67,76,78,87,89,98]

case 2

Input: $n = 3, k = 7$

Output: [181,292,707,818,929]

Boundary Test:

case 1

Input: $n = 1, k = (\text{any value})$

Output: []

case 2

Input: $n = 2, k = 0$

Output: [11,22,33,44,55,66,77,88,99]

Performance Test:

case 1

Input: $n = 5, k = 3$

Output: ~

case 2

Input: $n = 8, k = 2$
Output: ~

Note

Keypoints

- Please use **C++** to implement above algorithm and provide **screenshots of the output results**
- You can use **brute-force methods**, but algorithms with smaller complexity of time and space consuming are recommended
- Your program should run **successfully** and output the **correct** answers for every test case (your output results for test cases in performance test can be **saved in a .txt file in a comma-delimited format**)
- Please make sure there are **necessary comments** in your source code. Plagiarism is strictly forbidden.

Submission

- Compilable C++ source codes
- A brief documentation (PDF is recommended)
- Two separate txt file named as '**StudentID_perf_case_1.txt**' and '**StudentID_perf_case_2.txt**'
- Pack all above files and compress it into a **ZIP** file. Please rename the ZIP file as '**StudentID_Name_Assignment_1.zip**'
- Send the zip file to the email of TA:
 - **Mon. 3-4** 354207983@qq.com
 - **Mon. 5-6** 792093953@qq.com
- Please send the email **by Apr.12th, 2021**.