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 = (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**.