Cover Sheet

1. Please keep your work covered during the exam. You have 60 minutes to challenge the exam.
2. You have to complete at least 50% of questions to go to an interview session with us.
3. You have to stop working after the time’s up.
4. You are allowed to use the Internet during the coding exam.
5. You are allowed to use any programming language.
6. You can submit your work before the time’s up.
7. You can leave the exam at any time but you will be disqualified.

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[1] Given a number, please verify the next n numbers. The number is **Invalid** if there is the same digit in a number and the given number at the same index. The number is **Valid** if any of their indexes are not equal.

Output
The input is valid if a string of number and the given number do not have the same digit in the same index eg.:
123 and 312 are Valid
1**2**3 and 3**2**1 are Invalid

Example

Input A : 9876543

Input B	Output
3467985 7865439 8743956 3456789	Valid Invalid Valid Invalid

[2] Classify a given integer as abundant, deficient, or perfect.

Abundant numbers are less than the sum of all their proper divisors.
Deficient numbers are greater than the sum of their proper divisors.
Perfect numbers equal the sum of their proper divisors.
Note that while a number divides itself, it is not considered a proper divisor.

Example

No.	Input	Output
1	15	deficient
2	18	abundant
3	6	perfect

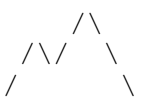
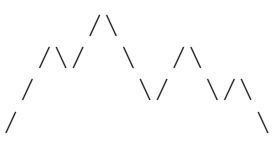
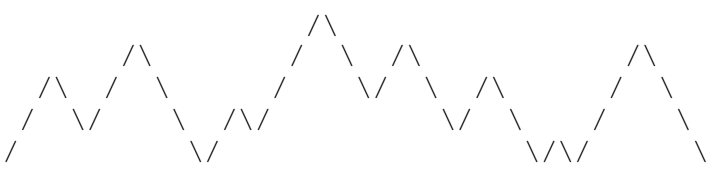
[3] REVERSE: You do not have access to the statement. You have to guess what to do by observing the following set of tests:

No.	Input	Expected output
1	48 65 6C 6C 6F 20 77 6F 72 6C 64 21	Hello world!
2	43 6F 64 69 6E 47 61 6D 65 20 72 6F 63 6B 27 73	CodinGame rock's
3	54 68 65 20 48 69 74 63 68 68 69 6B 65 72 27 73 20 47 75 69 64 65 20 74 6F 20 74 68 65 20 47 61 6C 61 78 79 2E	The Hitchhiker's Guide to the Galaxy.
4	49 20 6c 6f 76 65 20 54 69 73 63 6f 20 42 61 6e 6b 20	I love Tisco Bank

[4] REVERSE: You do not have access to the statement. You have to guess what to do by observing the following set of tests:

No.	Input	Expected output
1	1 1	2
2	6 4 8 31 7 5 9	35
3	1 2	3
4	40 51 72 8	80
5	33 30 31 22 4 45 46 67 66	71

[5] REVERSE: You do not have access to the statement. You have to guess what to do by observing the following set of tests:

No.	Input	Expected output
1		2
2		4
3		8

[6] The Syracuse (or Collatz) suite is defined as follows: given an initial integer greater than 0, we apply the following operations while the integer is different that 1:
- it is divided by 2 when even,
- it is multiplied by 3 and raised by 1 when odd.

Your program must display the Syracuse suite of the number N and stop when the value 1 is reached.

Example

Input	Output
5	5 16 8 4 2 1

[7] The objective is to mix a sentence into n blocks.

Go through the sentence placing one character into each block in turn. After the last block, go back to the first block and repeat until the end of the sentence.

At the end, all blocks should have the same length, so use '**x**' to fill any short blocks.

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Sentence:    AbcdEfghIjk
   Block 1: A          Block 2: b

   Block 1: Ac         Block 2: bd

   Block 1: AcE        Block 2: bdf

   ...                 ...

   Block 1: AcEgIk     Block 2: bdfhj

Complete with 'x':

   Block 1: AcEgIk     Block 2: bdfhjx

Final state: AcEgIk bdfhjx
```

Example

No.	Input	Expected output
1	3 Is text important ?	Ittmrn? se pttx xioa x
2	5 Pay_attention_to_space	Ptioc ato_e yensx _n_px attax
3	1 Une chocolatine !	Une chocolatine !