

### Repeated digits

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When we write numbers down some (e.g., 11) have repeated digits, and others (e.g., 12) don't. Of course if we change the base in which we're writing numbers then that can affect whether or not a number has repeated digits. For instance, the decimal number 11:

Base	Number	Repeat
2	$1011_2$	Yes
3	$202_3$	Yes
4	$23_4$	No
...	...	...
9	$12_9$	No
10	$11_{10}$	Yes

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### Task

- In base  $b$  is there a largest number without repeated digits? If so, what is it?
- Write a program which carries out the following two tasks:
  - A. Given a base  $b$  and an integer  $n$  finds the longest block of integers all having repeated digits in base  $b$  that are less than  $n$ . The output should be the first integer of the block (in normal decimal representation) and the length of the block (if there is more than one block of the same length, the first one should be given.)
  - B. Given two bases,  $b$  and  $c$ , finds the smallest integer  $n$  which has repeated digits in both bases.

Input will be in a series of lines from `stdin`. A properly formatted line will consist of the letter A or B, followed by whitespace, followed by two numbers separated by whitespace. Output should be to `stdout`. If a line is properly formatted just the answer for that type of question should be given in a single line. If a line is improperly formatted then output should be the text "Bad line: " followed by the improperly formatted line.

Submit an answer (and justification) for the first part and your program for the second part.

**Relates to Objectives**

1.2, 1.4, 2.2, 2.7, 3.1, 3.5.

(Individual)