

Question 1: *Palindromic Numbers*

A *palindromic number* is one that is the same when its digits are reversed.

For example:

- 98789 is a palindrome;
- 12344321 is a palindrome;
- 12345 is not a palindrome as it becomes 54321 when reversed.

Except for 0, a palindromic number's leftmost digit must be non-zero.

1(a) [25 marks]

Write a program that reads in a positive integer of up to 20 digits.

You should output the smallest palindromic number that is higher than the input.

Sample run 1

17
22

Sample run 2

343
353

1(b) [2 marks]

What is the largest difference between a palindromic number (of up to 20 digits) and the next highest palindromic number?

1(c) [4 marks]

How many integers are there, between 1 and 99999 inclusive, that are *not* the sum of two palindromic numbers?