Do not open until contest starts

Instructions for Participants

• Contest URL: https://domjudge.cs.fsu.edu
• You have 5 hours to answer questions.
• Teams are eligible to win prizes (in either division) only if they do not include faculty/instructors
• You may submit solutions in the following languages:
  – C/C++14
  – Python 3.9.2
  – Java 11
  – C# 7.0
• You are only allowed access to official language documentation and COP3014/COP3363 reference material. You are restricted to:
  – C/C++14: http://www.cplusplus.com/reference/
  – Python 3.9.2: https://docs.python.org/3/
  – C# 7.0 https://docs.microsoft.com/en-us/dotnet/csharp/
• You are also allowed one textbook or material no larger than 8.5” x 11” x 2” volume.
• No other resources (e.g. Stack Overflow, Google, Wikipedia) are permitted. Using non-permitted materials will lead to disqualification.
• Teams are restricted to using one workstation (computer) each, including peripherals.
• Use of a cell phone to circumvent these restrictions will lead to disqualification. Use of cell phones in contest rooms is not permitted.
• The Clarifications tab on Domjudge may be used to submit questions pertaining to each problem. Do not use this feature to request troubleshooting help.

• All input is redirected via STDIN.

• All output must be formatted to specification in terms of capitalization and spacing, and floating point precision. Please refer to the example output for each question.

• ALL QUESTIONS AFTER QUESTION 1 ARE SORTED RANDOMLY, THEY ARE NOT IN ASCENDING DIFFICULTY ORDER

• Do not include a shebang in your submissions.

• Scoring:
  – Teams are ranked according to score. A higher score is rewarded by answering more questions while acquiring fewer penalties.
  – The team that solves the greatest number of questions in the quickest time wins.
  – Teams which solve the same number of problems are ranked by least total time.
  – Teams may resubmit solutions as many times as needed, but incorrect submission attempts will result in time penalties (and thus a lower score.)
  – The scoreboard may be accessed during the first four hours of the contest. The scoreboard will freeze during the final hour.

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A special thank you to all the question writers, proctors and volunteers for helping make this contest possible!
1 The Great Palindromic Conversion

Researchers Dr. Awkward and Dr. Ellerd made a scary discovery this morning. According to their findings, our current number system is faulty and needs to be changed immediately so that there are more palindromic numbers. Dr. Ellerd claims that if our number system isn’t changed within 101 hours, society will collapse. A palindromic number is a number that reads the same forwards as it does backwards. For example, 363 is a palindromic number, but 1414 is not.

Dr. Awkward has tasked you with the project to convert various integers into palindromes. To convert a number into a palindromic number, Dr. Awkward wants you to follow the procedure of summing a number with the number formed by reversing the order of its digits, and checking if that sum is a palindrome.

If the sum is NOT a palindromic number, repeat the process again, summing the new number with the number formed by reversing the order of its digits. Because summing numbers with the reverse of itself can potentially result in very large numbers, you decide that any number that takes more than 10 iterations, without forming a palindromic number, has an unknown palindromic number solution.

1.1 Input
Domjudge will have sample Input and Output that you can download directly, so you do not need to manually type out the sample provided.

Input will be a single integer $N$, where $10 < N < 1,000,000$. You may assume that $N$ is not initially a palindromic number.

1.2 Output
DOMjudge will have sample Input and Output that you can download directly, so you do not need to manually type out the sample provided.

Your program should print the first palindrome that can be formed from the procedure. Remember, the procedure is to sum a number with the number formed by reversing the order of its digits and repeat this process until the sum is a palindromic number. If a palindrome cannot be formed within the first 10 iterations of the procedure, then print “unknown”.

1.3 Sample Input/Output
Domjudge will have sample Input and Output that you can download directly, so you do not need to manually type out the sample provided.

<table>
<thead>
<tr>
<th>Sample Input 1</th>
<th>Sample Output 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>363</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Input 2</th>
<th>Sample Output 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>unknown</td>
</tr>
</tbody>
</table>

SAMPLE EXPLANATION ON NEXT PAGE
1.3.1 Sample Explanation

Sample 1: 75

- Iteration 1: $75 + 57 = 132$
- Iteration 2: $132 + 231 = 363$
- 363 is a palindrome, so print 363

Sample 2: 98

- Iteration 1: $98 + 89 = 187$
- Iteration 2: $187 + 781 = 968$
- ...
- Iteration 10: $1,716,517 + 7,156,171 = 8,872,688$
- A palindrome is not able to be created in under 10 iterations following the procedure rules