

ACSL  
2010 - 2011      **American Computer Science League**      Contest #1  

---

**Senior Division**  
**ACSL Prints**

**PROBLEM:** The Henry Classification System for fingerprints was developed by Sir Edward Henry in the late 1880's. The system is based upon the pattern of lines that appear on each finger. There are three basic patterns: the Arch, the Loop and the Whorl. Surprisingly, just the Whorl pattern is used in the classification system.

If you place your hands, palms down, on a surface, the Henry system labels the left pinky to the left thumb with the numbers 10 through 6. The right thumb to the right pinky are numbered 1 through 5. Each finger is given a Whorl number as shown in the following table:

Finger	10	9	8	7	6	1	2	3	4	5
Whorl numbers	1	1	2	2	4	16	16	8	8	4

A value called the Primary Group Ratio is calculated as follows:

$$\frac{1 + \text{sum of whorled even finger numbers}}{1 + \text{sum of the whorled odd finger numbers}}$$

If a whorl is detected on fingers 8, 7 and 2 the calculation would give:

$$\frac{1 + 2 + 16}{1 + 2} = \frac{19}{3}$$

**INPUT:** There will be 5 lines of input. Each line will contain two positive integers representing the Primary Group Ratio.

**OUTPUT:** For each Input line print ( in any order) the finger numbers where the Whorls are located. If there are no Whorls, then print None.

**SAMPLE INPUT**

1. 19, 3
2. 1, 1

**SAMPLE OUTPUT**

1. 2, 7, 8
2. None

**2010 - 2011**      **ACSL**  
**American Computer Science League**      **Contest #1**

---

**Senior Division**  
**ACSL Prints**  
**TEST DATA**

**TEST INPUT**

1. 25, 29
2. 29, 5
3. 17, 4
4. 10, 27
5. 32, 32

**TEST OUTPUT**

1. 1, 2, 3, 4, 5
2. 2, 4, 5, 6
3. 2, 7, 9
4. 1, 3, 4, 7, 10
5. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10