# Problem 401: Binary Watch

## Problem Information

**Difficulty:** Easy
**Acceptance Rate:** 57.65%
**Paid Only:** No
**Tags:** Backtracking, Bit Manipulation

## Problem Description

A binary watch has 4 LEDs on the top to represent the hours (0-11), and 6 LEDs on the bottom to represent the minutes (0-59). Each LED represents a zero or one, with the least significant bit on the right.

* For example, the below binary watch reads `"4:51"`.




Given an integer `turnedOn` which represents the number of LEDs that are currently on (ignoring the PM), return _all possible times the watch could represent_. You may return the answer in **any order**.

The hour must not contain a leading zero.

* For example, `"01:00"` is not valid. It should be `"1:00"`.

The minute must consist of two digits and may contain a leading zero.

* For example, `"10:2"` is not valid. It should be `"10:02"`.

**Example 1:**

**Input:** turnedOn = 1 **Output:**
["0:01","0:02","0:04","0:08","0:16","0:32","1:00","2:00","4:00","8:00"]

**Example 2:**

**Input:** turnedOn = 9 **Output:** []

**Constraints:**

* `0 <= turnedOn <= 10`

## Code Snippets

**C++:**

```
class Solution {
public:
vector<string> readBinaryWatch(int turnedOn) {

}
};
```

**Java:**

```
class Solution {
public List<String> readBinaryWatch(int turnedOn) {

}
}
```

**Python3:**

```
class Solution:
def readBinaryWatch(self, turnedOn: int) -> List[str]:
```