Solution Review: Remove Even Integers from a List

This review provides a detailed analysis of the different ways to remove even integers from a list.

We'll cover the following

Solution 1: Doing it “by hand”

```
def remove_even(lst):
    odds = []  # Create a new empty list
    for number in lst:  # Iterate over input list
        # Check if the item in the list is NOT even
        # ('%' is the modulus symbol!)
        if number % 2 != 0:
            odds.append(number)  # If it isn't even append it to the empty l
    return odds  # Return the new list


print(remove_even([3, 2, 41, 3, 34]))

```

This solution starts with the first element of the list and chec even. If it is odd, the element is appended to a new list. Otherwise, it skips to the next element. This repeats until the end of the list is reached.

You might have written a solution like this one. It isn't *wrong*, it's not very Pythonic. Python is known for its economical code so we'll be introducing ways to make your solutions as Pythonic as possible throughout this course!

Time Complexity

Since the entire list has to be iterated over, this solution is in $O(n)$ time.

Solution #2: Using list comprehension

```
def remove_even(lst):
    # List comprehension to iter aover List and add to new list if not even
    return [number for number in lst if number % 2 != 0]


print(remove_even([3, 2, 41, 3, 34]))
```

A Python technique called **list comprehension** is used to iterate over the initial array. With list comprehension, checking a condition and appending to the new list can all be done in one line. The code for it starts and ends with a **'['** and ends with a **']'**. The basic syntax is:

```
newList = [expression(i) for i in oldList if filter(i)]
```

The list is iterated. If the number is odd, it is appended to a list to be returned, and if even, the element is filtered out from the list. Repeat until the end of the list is reached.

Time Complexity

The time complexity of this solution is also O(n), since only the syntax has changed while the algorithm still iterates over all elements of the list.

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