



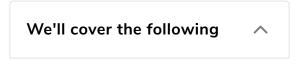






Solution Review: Nested Loop with Multiplication (Pro)

This review provides a detailed analysis of the different ways to solve the Nested Loop with Multiplication challenge



- Solution
 - Time Complexity

Solution

```
1  n = 10 # can be anything
2  sum = 0
3  pie = 3.14
4  j = 1
5  for var in range(n):
6   while j < var:
7      sum += 1
8      j *= 2
9      print(sum)
10</pre>
```

The outer loop in the main function has n iterations as it iterates on the list generated from range(n). If the condition j < var is true, the inner loop entered. However, immediately, j is doubled. Note that j is not reset to 1 in

the code. The inner while loop will run at most once for each outer loop. Therefore, **lines 6, 7 and 8** run O(n) times each. Since we are interested in an upper bound on the worst case running time, let's assume these statements run exactly n times.

Statement	Number of Executions
n = 10	1
sum = 0	1
pie = 3.14	1
for var in range(n):	n
while j < var:	n
sum+=1;	n
j *= 2;	n
print(sum)	n

Time Complexity#

Running Time Complexity = 1+1+1+n+n+n+n+n

$$= 3 + 5n$$



To find the Big O time complexity,







- 1. Drop the leading constants $\Rightarrow n$
- 2. Drop the lower order terms $\Rightarrow n$

The Big O time complexity of the above is hence, O(n)

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