

PSA Assignment -1

Leetcode – 238 (Product Except Self)

Approach: Brute-Force:

The screenshot shows a LeetCode submission for the problem "Product Except Self". The submission is marked "Time Limit Exceeded" with a red banner. The left pane shows the "Submissions" tab with a list of test cases and a "Last Executed Input" section containing a long list of numbers. The right pane shows the code for the solution, which uses a brute-force approach. The code is as follows:

```
class Solution:
    def productExceptSelf(self, nums: List[int]) -> List[int]:
        work = [0]
        ans = []
        if (True):
            b = L0238(nums,ans,work,"Brute Force")
        if (False):
            b = L0238(nums,ans,work,"Use Division")
        if (False):
            b = L0238(nums,ans,work,"n time n space")
        if (False):
            b = L0238(nums,ans,work,"n time 1 space")
        return ans

#####
# You cannot change anything in L0238
#####
class L0238:
    def __init__(self,a: List[int],ans: List[int], work:'list of size 1', alg:'string') ->
        None
```

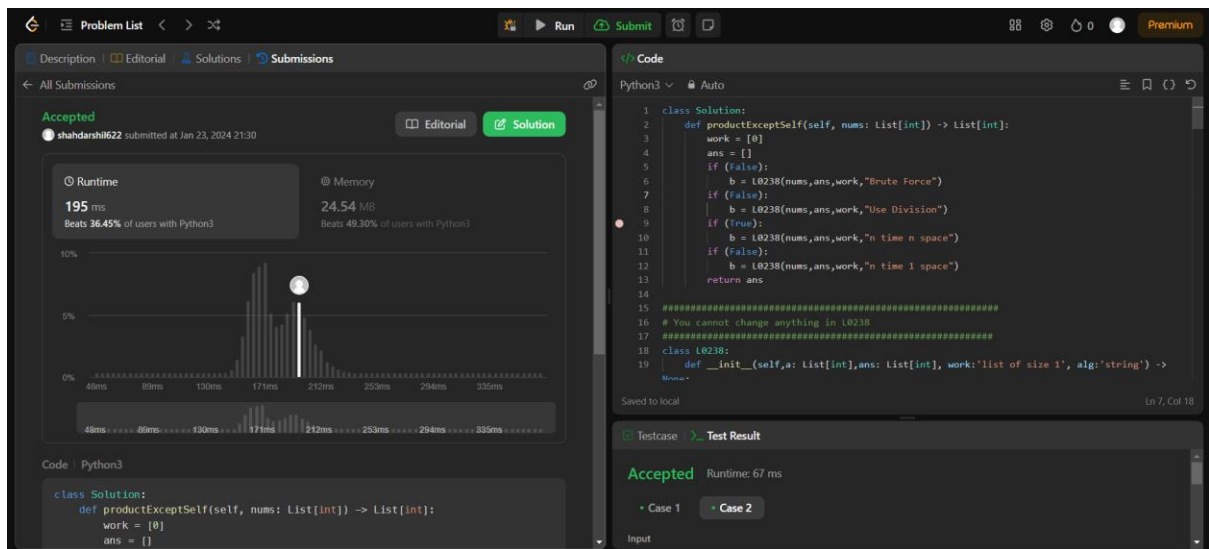
Approach – Division

The screenshot shows a LeetCode submission for the problem "Product Except Self". The submission is marked "Accepted" with a green banner. The left pane shows the "Submissions" tab with a list of test cases and a "Runtime" section showing a bar chart of execution times. The right pane shows the code for the solution, which uses a division approach. The code is as follows:

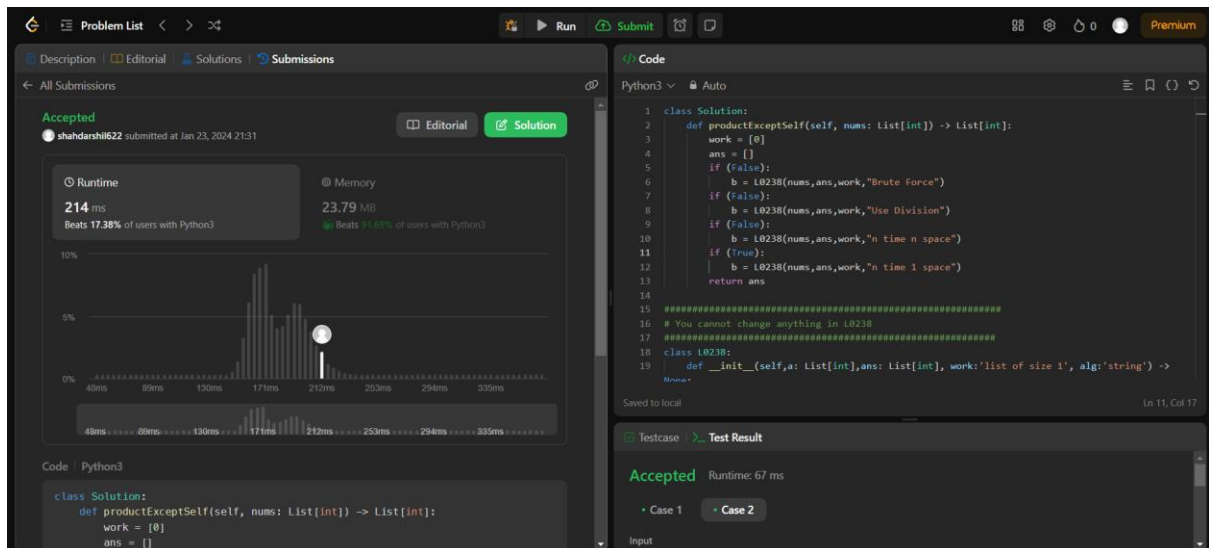
```
class Solution:
    def productExceptSelf(self, nums: List[int]) -> List[int]:
        work = [0]
        ans = []
        if (False):
            b = L0238(nums,ans,work,"Brute Force")
        if (True):
            b = L0238(nums,ans,work,"Use Division")
        if (False):
            b = L0238(nums,ans,work,"n time n space")
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        return ans

#####
# You cannot change anything in L0238
#####
class L0238:
    def __init__(self,a: List[int],ans: List[int], work:'list of size 1', alg:'string') ->
        None
```

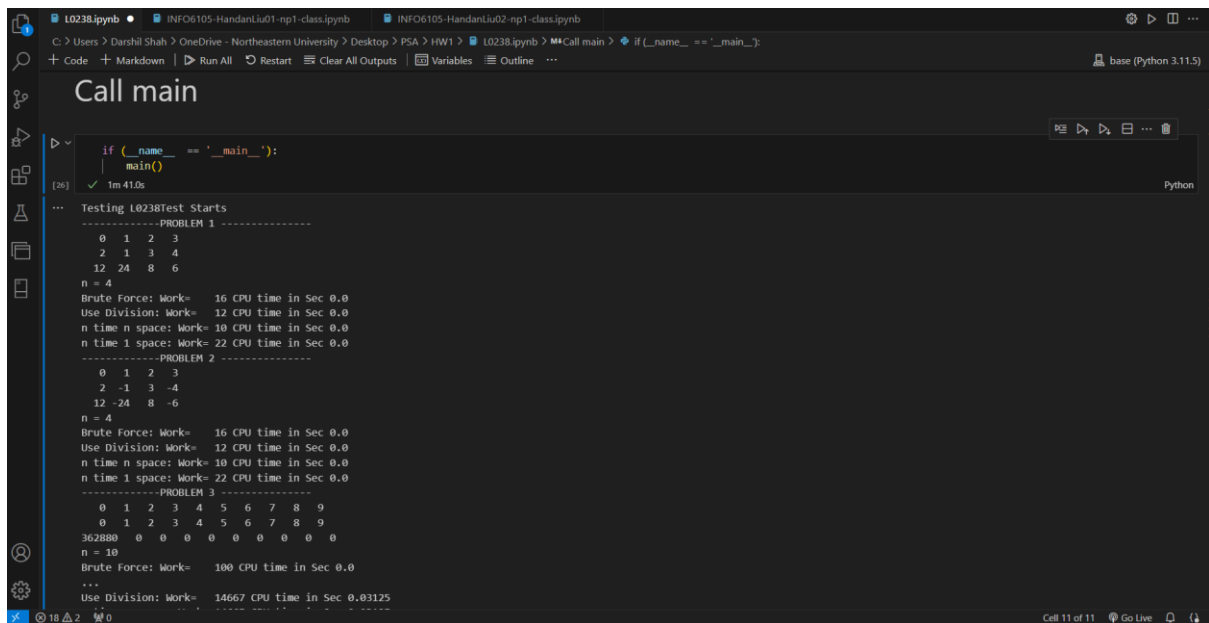
Approach – n time n space:



Approach – n time 1 space

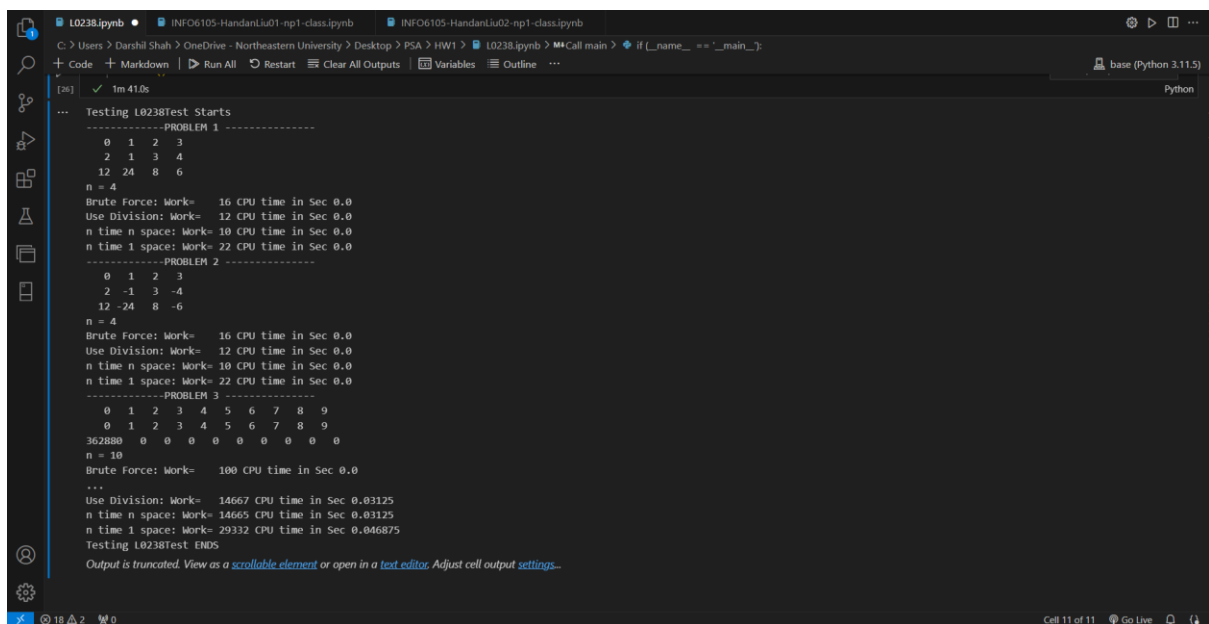


Screenshot of the output terminal for jupyter notebook:



The screenshot shows a Jupyter Notebook interface with a terminal window titled "Call main". The terminal output displays the execution of a Python script. The script starts with a function definition for "main" and then calls it. The output shows the results of a test suite, including the number of CPU time in seconds for various operations. The test results are as follows:

```
Testing L0238Test Starts
-----PROBLEM 1 -----
0 1 2 3
2 1 3 4
12 24 8 6
n = 4
Brute Force: Work= 16 CPU time in Sec 0.0
Use Division: Work= 12 CPU time in Sec 0.0
n time n space: Work= 10 CPU time in Sec 0.0
n time 1 space: Work= 22 CPU time in Sec 0.0
-----PROBLEM 2 -----
0 1 2 3
2 -1 3 -4
12 -24 8 -6
n = 4
Brute Force: Work= 16 CPU time in Sec 0.0
Use Division: Work= 12 CPU time in Sec 0.0
n time n space: Work= 10 CPU time in Sec 0.0
n time 1 space: Work= 22 CPU time in Sec 0.0
-----PROBLEM 3 -----
0 1 2 3 4 5 6 7 8 9
0 1 2 3 4 5 6 7 8 9
362880 0 0 0 0 0 0 0 0 0
n = 10
Brute Force: Work= 100 CPU time in Sec 0.0
...
Use Division: Work= 14667 CPU time in Sec 0.03125
```



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-----PROBLEM 3 -----
0 1 2 3 4 5 6 7 8 9
0 1 2 3 4 5 6 7 8 9
362880 0 0 0 0 0 0 0 0 0
n = 10
Brute Force: Work= 100 CPU time in Sec 0.0
...
Use Division: Work= 14667 CPU time in Sec 0.03125
n time n space: Work= 14665 CPU time in Sec 0.03125
n time 1 space: Work= 29332 CPU time in Sec 0.046875
Testing L0238Test ENDS
Output is truncated. View as a scrollable element or open in a text editor. Adjust cell output settings.
```