Expression

Algorithm Design Term Project

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Expression

Given 3 integers a, b, and c. The task was to insert signs of operations '+' and '*', and probably brackets between the numbers so that the value of the resulting expression is as large as possible:
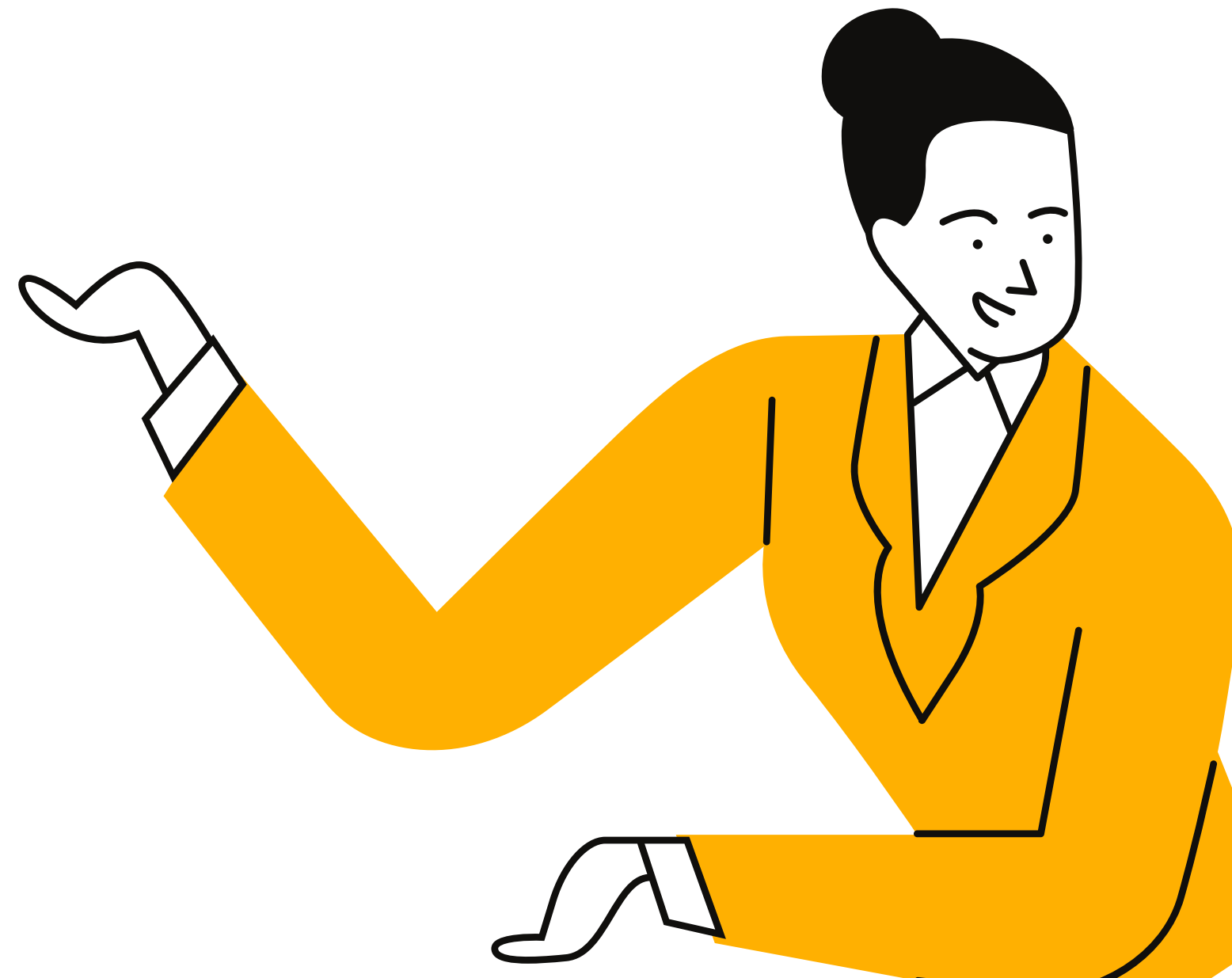
- 1+2*3=7
- 1*(2+3)=5
- 1*2*3=6
- (1+2)*3=9

```
input

1
2
3

output

9
```

LET'S START!

Analysis

```
def maxVal(v):
    if v == 0:
        return myList[v]
    else:
        add = myList[v] + maxVal(v-1)
        mul = myList[v] * maxVal(v-1)
        return max(add,mul)
```

Given that a=1, b=2, c=3:

maxVal() will check the do the following operation in this order:

- (1 + 2) = 3 (max)
- (1 * 2) = 2

- (1 + 2) + 3 = 6
- (1 + 2) * 3 = 9 (max)

maxValRev() will check the do the following operation in this order:

- (2 + 3) = 5
- (2 * 3) = 6   (max)

- 1 + (2 * 3) = 7 (max)
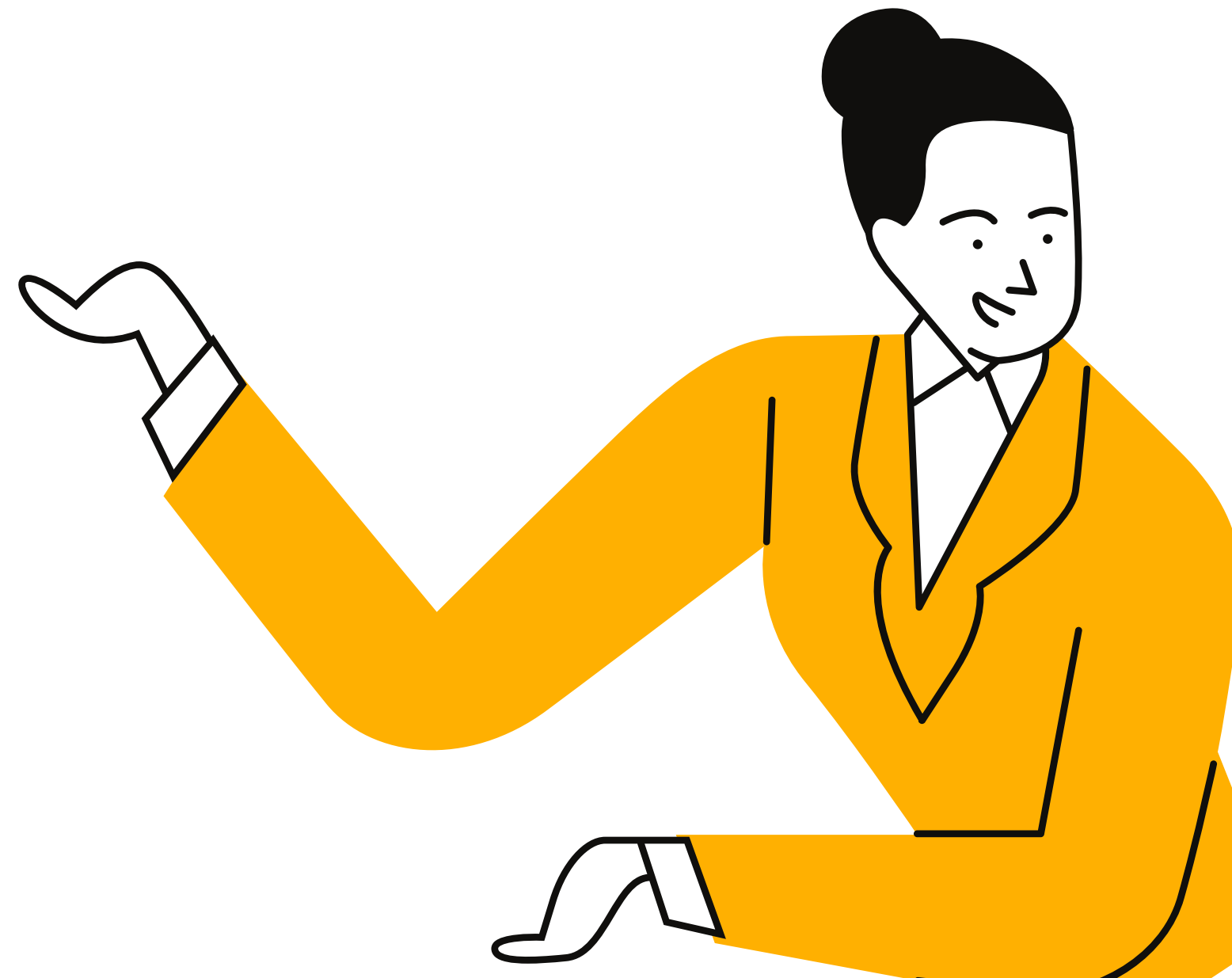- 1 * (2 * 3) = 6

```
def maxValRev(v):
    if v == 2:
        return myList[v]
    else:
        addRev = myList[v] + maxValRev(v+1)
        mulRev = myList[v] * maxValRev(v+1)
        return max(addRev,mulRev)
```

```
print(max(maxVal(2), maxValRev(0)))
```

find max(9, 7) => 9
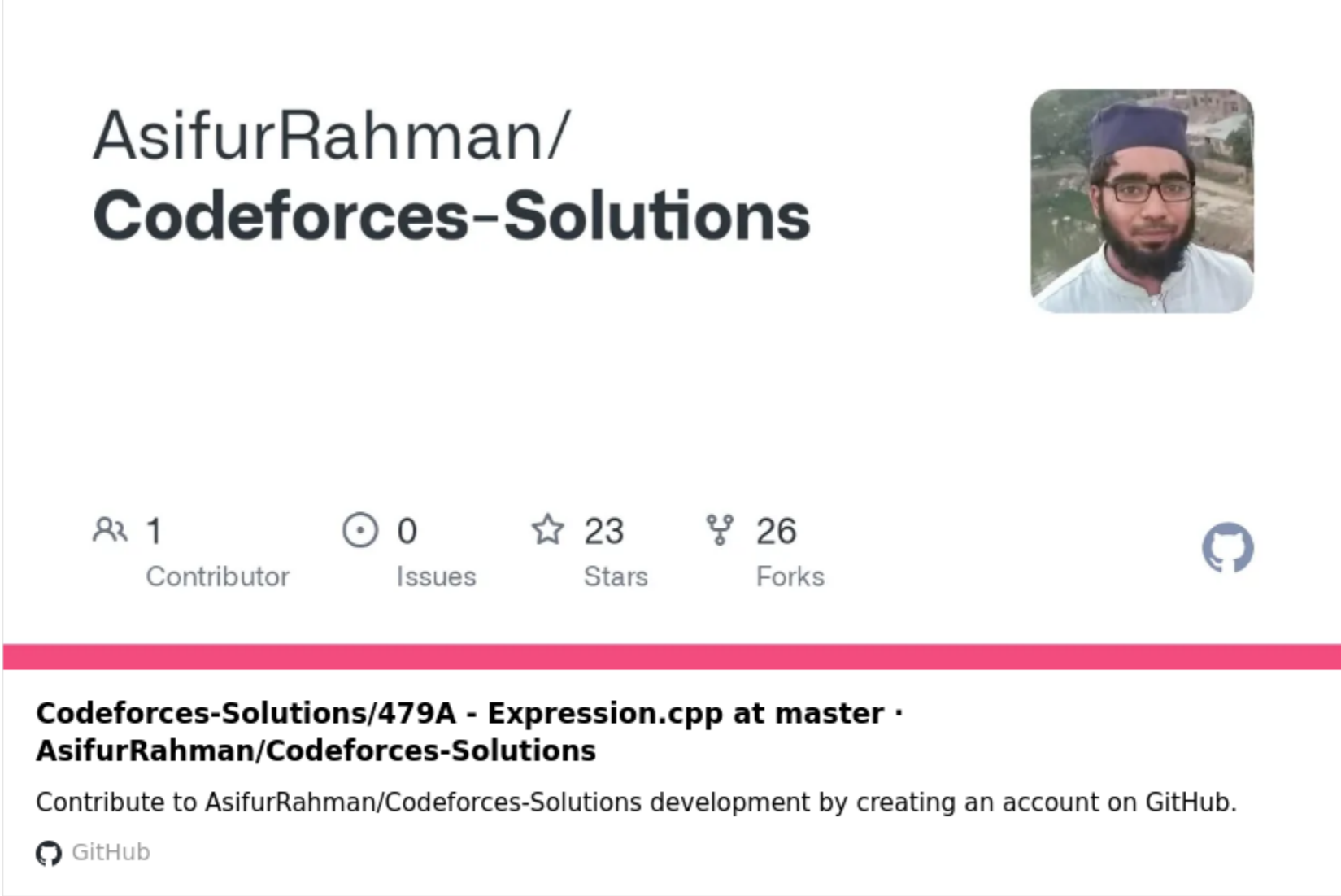
Analysis (Brute Force Solution)

```python
1   a = int(input())
2   b = int(input())
3   c = int(input())
4
5   ans = a + b + c
6   ans = max(ans, a * b * c)
7   ans = max(ans, (a + b) * c)
8   ans = max(ans, a + (b * c))
9   ans = max(ans, (a * b) + c)
10  ans = max(ans, a * (b + c))
11  print(ans)
12
```

Submission

#	When	Who	Problem	Lang	Verdict	Time	Memory
My Submissions							▶
173677842	Sep/27/2022 15:20 UTC+7	jeffreyjczy	A - Expression	Python 3	**Accepted**	46 ms	0 KB
173677790	Sep/27/2022 15:19 UTC+7	jeffreyjczy	A - Expression	Python 3	**Accepted**	31 ms	0 KB

Reference

https://github.com/AsifurRahman/Codeforces-Solutions/blob/master/479A%20-%20Expression.cpp

THANK YOU