

Product of All Possible Differences

Let $t = (t_1, t_2, \dots, t_n) \in \mathbb{R}^n$ and all elements are distinct, i.e., $t_i \neq t_j$ for all i, j . Calculate

$$d = \prod_{i \neq j, i=1,2,\dots,n} (t_i - t_j)$$

For example, for $n = 4$, the result is

$$d = (t_1 - t_2)(t_1 - t_3)(t_1 - t_4)(t_2 - t_3)(t_2 - t_4)(t_3 - t_4)$$

Input Format

1d numpy array of size n containing real numbers t_1, t_2, \dots, t_n (all distinct)

Output Format

Output the product d as a floating-point number.

Constraints

- $t \in \mathbb{R}^n$
- $1 \leq n \leq 2000$
- All input values are distinct real numbers in the range $[-100, 100]$

Sample Input

```
t = [1, 2, 3]
```

Sample Output

```
-2.0
```

Implementation

Goal: Fill in the following function:

```
def product_of_all_possible_differences(t):  
    ...  
    return ... # Return the product as a floating-point number  
exec("\n".join(iter(input, "#Exit"))) # Don't remove this line
```

Hint

- Use `np.prod` to compute the product of all elements