-- coding: utf-8 --

import numpy as np

Input format example:

103

10 100 20 1

5 40 15 2

Where first line is the weight,

second is the items' profits

and third is the items' weights

Reading input

w = int(input())
Ps = [int(p) for p in input().split()]
Ws = [int(w) for w in input().split()]
n = len(Ps)

To make the code faster

Ps = np.array(Ps)
Ws = np.array(Ws)

T = np.zeros(w+1)

Build vector T

for i in range(w+1):
for j in range(n):
# If we can insert the item
if (Ws[j] <= i):
# Keep the item with max profit which is either

```
# the previous item (with lower weight) or the
# current item (with heigher weight)
T[i] = max(T[i], T[i - Ws[j]] + Ps[j])
```

Output example:

241.0

Where 241.0 is the optimal knapsack value given the inputs

```
print(T[-1])
```