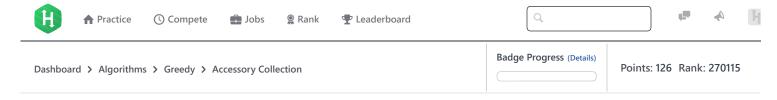
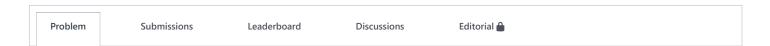
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Accessory Collection ■

by kevinsogo



Victoria is splurging on expensive accessories at her favorite stores. Each store stocks A types of accessories, where the i^{th} accessory costs i dollars ($1 \le i \le A$). Assume that an item's type identifier is the same as its cost, and the store has an unlimited supply of each accessory.

Victoria wants to purchase a total of $m{L}$ accessories according to the following rule:

Any \emph{N} -element subset of the purchased items must contain at least \emph{D} different types of accessories.

For example, if L = 6, N = 3, and D = 2, then she must choose 6 accessories such that any subset of 3 of the 6 accessories will contain at least 2 distinct types of items.

Given L, A, N, and D values for T shopping trips, find and print the maximum amount of money that Victoria can spend during each trip; if it's not possible for Victoria to make a purchase during a certain trip, print SAD instead. You must print your answer for each trip on a new line.

Input Format

The first line contains an integer, T, denoting the number of shopping trips. Each of the T subsequent lines describes a single shopping trip as four space-separated integers corresponding to L, A, N, and D, respectively.

Constraints

- $1 \le T \le 10^6$
- $1 \le D \le N \le L \le 10^5$
- $1 < A < 10^9$
- The sum of the L's for all T shopping trips $\leq 8 \cdot 10^6$.

Output Format

For each shopping trip, print a single line containing either the maximum amount of money Victoria can spend; if there is no collection of items satisfying her shopping rule for the trip's L, A, N, and D values, print SAD instead.

Sample Input

2 6 5 3 2 2 1 2 2

Sample Output

24 SAD

Explanation

Shopping Trip 1:

We know that:

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- Victoria wants to buy L=6 accessories.
- The store stocks the following A = 5 types of accessories: $\{1, 2, 3, 4, 5\}$.
- ullet For any grouping of N=3 of her L accessories, there must be $at\ least\ D=2$ distinct types of accessories.

Victoria can satisfy her shopping rule and spend the maximum amount of money by purchasing the following set of accessories: $\{3,4,5,5,4,3\}$. The total cost is 3+4+5+5+4+3=24, so we print 24 on a new line.

Shopping Trip 2:

We know that:

- Victoria wants to buy L=2 accessories.
- The store stocks A = 1 type of accessory: $\{1\}$.
- For any grouping of N=2 of her L accessories, there must be at least D=2 distinct types of accessories.

Because the store only carries ${\bf 1}$ type of accessory, Victoria cannot make a purchase satisfying the constraint that there be at least ${\bf D}={\bf 2}$ distinct types of accessories. Because Victoria will not purchase anything, we print that she is SAD on a new line.

f y in Submissions:<u>857</u> Max Score:60 Difficulty: Hard Rate This Challenge: ☆☆☆☆☆

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Current Buffer (saved locally, editable) & 49
                                                                                             Java 7
                                                                                                                               Ö
 1 ▼ import java.io.*;
 2 import java.util.*;
   import java.text.*;
    import java.math.*;
    import java.util.regex.*;
 6
 7 ▼ public class Solution {
 8
 9 🔻
         public static void main(String[] args) {
10
             Scanner in = new Scanner(System.in);
             int T = in.nextInt();
11
             for(int a0 = 0; a0 < T; a0++){
12 ▼
13
                 int L = in.nextInt();
                 int A = in.nextInt();
15
                 int N = in.nextInt();
16
                 int D = in.nextInt();
17
             }
18
         }
19
     }
20
                                                                                                                      Line: 1 Col: 1
                                                                                                                       Submit Code
                       Test against custom input
                                                                                                          Run Code
Upload Code as File
```

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