Save The Princess

Problem code: SHIRO

All submissions for this problem are available.

Shiro is leading an army to save the princess of his kingdom "Abra". The princess has been made a prisoner by the neighboring kingdom "Kadabra". Kadabra is a magical land and is full of challenges. Shiro's army has to pass **N** levels before they can get to the princess. After each level, the army gets a few flags to carry along. The flags can either all be of kindom Abra OR all of kingdom Kadabra. The magic of Kadabra forces Shiro's army to carry the flags irrespective of which kingdom they belong to. The princess doesn't know Shiro or anyone from his army. She will not escape with them unless she can trust them. She will trust them only if the number of Abra's flags they are carrying is atleast as much as the number of Kadabra's flags.

The army gets $\mathbf{a_i}$ flags at the end of the i^{th} level. Probability that flags received at the end of the i^{th} level will be Abra's flags is $\mathbf{p_i}$. Your task is to tell Shiro what is the probability that the princess will trust him once they reach her.

Input:

First line of input contains a single integer **T**, the number of test cases.

Each test starts with a single line having an integer, **N**, the number of levels in Kadabra.

Next line contains contains **N** integers with the i^{th} integer being $\mathbf{a_i}$ as described above.

Next line contains contains **N** integers with the i^{th} integer being $\mathbf{p_i}$ as described above. Note that the probabilities given will be in percents.

Output:

For each test case, output a line containing the required probability. The answer will be accepted if the relative error is not more than 10^{-6}.

Constraints:

$1 \le \mathbf{T} \le 100$
$1 \le \mathbf{N} \le 100$
$1 \le \mathbf{a_i} \le 100$
$0 \le \mathbf{p_i} \le 100$

Example:

Input:
2
5
1 2 3 4 4
0 100 100 0 50
2
5 5
50 60

Output:
0.5000000
0.8000000

Update:

Difference in answer upto 1e-6 will be ignored.

Author:	vamsi_kavala
Tester:	white_king
Editorial	http://discuss.codechef.com/problems/SHIRO
Tags	aug13 dp dynamic-prog easy simple-math vamsi_kavala

SUCCESSFUL SUBMISSIONS

User	Time	Mem	Lang	Solution
lokwanivanshaj	0.03	2.6M	C++ 4.3.2	View
deepakgupta13	0.03	3M	C++ 4.9.2	View
babyshean	0.03	3.2M	C++ 4.8.1	View
sandeep200296	0.04	3.3M	C	View
vishal_anand93	0.06	2.2M	C	View
aatzz_11	0.06	2.2M	C	View
adarshhsingh	0.06	2.2M	C	View
shimil	0.06	2.5M	C	View
gargankur74	0.06	2.6M	C++ 4.3.2	View
haibaraai	0.06	2.6M	C++ 4.3.2	View
brucewayne1234	0.06	2.6M	C++ 4.3.2	View
shankeyrocks	0.06	2.6M	C++ 4.3.2	View

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HELP

Program should read from **standard input** and write to **standard output**. After you submit a solution you can see your results by clicking on the **[My Submissions]** tab on the problem page. Below are the possible results:

- **Accepted** Your program ran successfully and gave a correct answer. If there is a score for the problem, this will be displayed in parenthesis next to the checkmark.
- **Time Limit Exceeded** Your program was compiled successfully, but it didn't stop before time limit. Try optimizing your approach.
- **Wrong Answer** Your program compiled and ran succesfully but the output did not match the expected output.
- **Runtime Error** Your code compiled and ran but

Date Added:	27-03-2013
Time Limit:	1 sec
Source Limit:	50000 Bytes
Languages:	ADA, ASM, BASH, BF, C, C99 strict, CAML, CLOJ, CLPS, CPP 4.3.2, CPP 4.9.2, CPP14, CS2, D, ERL, FORT, FS, GO, HASK, ICK, ICON, JAVA, JS, LISP clisp, LISP sbcl, LUA, NEM, NICE, NODEJS, PAS fpc, PAS gpc, PERL, PERL6, PHP, PIKE, PRLG, PYTH, PYTH 3.1.2, RUBY, SCALA, SCM guile, SCM qobi, ST, TCL, TEXT, WSPC

SUBMIT

encountered an error. The most common reasons are using too much memory or dividing by zero. For the specific error codes see the help section.

- **Compilation Error** Your code was unable to compile. When you see this icon, click on it for more information.

If you are still having problems, see a sample solution here.

Comments

anmolarora6699 *@ 12 Aug 2013 03:50 PM*

In the example, for the second test case, shouldn't the probability be 0.550000.?? I mean, if you calculate (5*50+5*60)/(5*100+5*100)..?? Or is there a different formula to calculate probability.?

tijoforyou *@ 12 Aug 2013 05:24 PM*

Look at it like this. There are four possibilities: KK, KA, AK, AA. (AK means all flags from first level are Abra and all flags from second level are Kadabra; and similarly for others). KK --> total Abra flags = 0 with probability = (1-0.5)*(1-0.6) = 0.5*0.4 = 0.2. KA --> total Abra flags = 5 with probability = (1-0.5)*0.6) = 0.5*0.6 = 0.3. AK --> total Abra flags = 5 with probability = 0.5*(1-0.6) = 0.5*0.4 = 0.2. AA --> total Abra flags = 10 with probability = 0.5*0.6 = 0.3. As you can see total probability is 1. Now, required probability is the sum of probabilities of all cases with total Abra flags greater than or equal to total Kadabra flags (or Abra flags >= 5). Which is cases 2, 3, and 4 ==> our answer = 0.3+0.2+0.3 = 0.8

gtpraveen *@ 6 Oct 2013 02:01 AM*

@tijiforyou if N is 100 then you will have 2^100 combinations to check. There should be a simpler way of doing this.

codedecode0111 *@ 5 Apr 2014 01:25 PM*

anmolarora6699 : Even, i got confused at the same thing why isn't the answer 0.55000 but then I re read the problem statement once again and found that... "The flags can either all be of kindom Abra OR all of kingdom Kadabra" So, it has to be done like @tijoforyou has said. Otherwise, our approach is right. :)

Need help? Post a comment. But before that please spare a moment to read the guidelines.
Your name:
akashiitj
Comment: *

Save

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