CodeVita
The TCS Global Coding Contest

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Coding Area

A B C D E F

ONLINE EDITOR (C)

Stock Update

Problem Description

A stock exchange processes N stocks and once every 20 seconds it sends out the best five prices and total order quantities per stock. While the message size for this market data is < S kilobytes per stock, the exchange needs to send it out as a fixed size frame of F KB. As a result the bandwidth consumption is (N * S) KB / 20 sec or (N * S * 8)/20 Kbps

The exchange decides to use compression and packing of messages in to frames, to reduce bandwidth consumption. Given a list of messages, their original size, and their compressed size, you need to pack these messages in to fixed FKB frames such that the number of frames is minimized. A message cannot cut across frames. There may be wasted space per frame. Messages can be mapped in any order.

Constraints

C < = S < = F

N < = 10000

F <= 1024

Input

First line contains an integer N denoting the number of messages

Next line contain an integer F denoting size of the frame (in KB)

Next N lines contain 2 integers delimited by space denoting original message size (S) and compressed message size(C), respectively. Both are in KB

Output

Print the minimum number of frames required to send all the messages

Test Case

Explanation

Example 1

Input

6

20

10 8

9 8

6 4

15 10

8 6

5 4

Output

2

Explanation

N=6, F=20.

For packing the messages in the frame we shall consider only the compressed message sizes. Since the total size of the 6 compressed messages is 40 KB and the bin size is 20 bytes, the optimal number of frames required to pack all message without splitting any message across frames, is 2. We need to see if this is possible. One way of packing them is to put the first three messages into one (8+8+4=20KB) into one frame, and the last three into the second frame (10+6+4=20KB). As the optimal compression is possible, this is the minimum number of frames in which it can be packed. Hence the output is 2.

Example 2

Input

7

20

10 8

9 8

6 4

15 10

8 6

5 4

10 9

Output

3

Explanation

N=7, F = 20

For packing the messages in the frame we shall consider only the compressed message sizes. Since the total size of the 7compressed messages is 49 kB and the bin size is 20 kB, the optimal number of frames required to pack all message without splitting any message across frames, is 3. One way of packing them into frames is to pack the first three into one frame (8+8+4=20), the next 3 into the second frame (10+6+4=20) and the last in a third frame. As the packing into frames can be achieved in the optimal number of frames, 3 is the output

Upload Solution [Question : C]

☐ I, **Christian** confirm that the answer submitted is my own.

☐ Took help from online sources (attributions)

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