

There are N cities, and M directed roads connecting them. Now you want to transport K units of goods from city 1 to city N . There are many robbers on the road, so you must be very careful. The more goods you carry, the more dangerous it is. To be more specific, for each road i , there is a coefficient a_i . If you want to carry x units of goods along this road, you should pay $a_i * x^2$ dollars to hire guards to protect your goods. And what's worse, for each road i , there is an upper bound C_i , which means that you cannot transport more than C_i units of goods along this road. Please note you can only carry integral unit of goods along each road.

You should find out the minimum cost to transport all the goods safely.

Input

There are several test cases.

The first line of each case contains three integers, N , M and K . ($1 \leq N \leq 100$, $1 \leq M \leq 5000$, $0 \leq K \leq 100$). Then M lines followed, each contains four integers (u_i, v_i, a_i, C_i) , indicating there is a directed road from city u_i to v_i , whose coefficient is a_i and upper bound is C_i . ($1 \leq u_i, v_i \leq N$, $0 < a_i \leq 100$, $C_i \leq 5$)

Output

Output one line for each test case, indicating the minimum cost. If it is impossible to transport all the K units of goods, output '-1'.

Sample Input

```
2 1 2
1 2 1 2
2 1 2
1 2 1 1
2 2 2
1 2 1 2
1 2 2 2
```

Sample Output

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4
-1
3
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