

DreamTeam Selection (dreamteam)

William, like most respectable Italians, pursues his personal *conflict of interest* with supreme passion. He really loves being both an organizer of the Italian IOIT contests, and coaching his personal team for the same competition! His team (the *RoseToPCoders*) did not made it through this year's competition, so it's time to plan for a better performance next year.

William has already selected a short-list consisting of N students, numbered from 0 to $N - 1$, each of them with a best friend F_i . Remember that best-friendship is always symmetrical: if a 's best friend is b , then b 's best friend is a .



Figure 1: Roseto degli Abruzzi, home of the *RoseToPCoders*.

William knows his buddies very well: for each of them, he measured how many points P_i the student is able to score in a typical competition if his best friend is **not** in the team, and how many points $Q_i \leq P_i$ the student is able to score if his best friend is in the team (the presence of a friend is always distracting).

Help William choose the best team consisting of **exactly** K contestants for next year's competition!

📎 Among the attachments of this task you may find a template file `dreamteam.*` with a sample incomplete implementation.

Input

The first line contains two integers N, K . Each of the following N lines contains 3 integers F_i, P_i, Q_i .

Output

You need to write a single line with an integer: the maximum number of points that a team of exactly K contestants (among the N given) can score in a typical competition, taking friendships into account.

Constraints

- $1 \leq K \leq N \leq 100\,000$.
- $0 \leq F_i < N$ for each $i = 0 \dots N - 1$.
- $0 \leq Q_i \leq P_i \leq 20\,000$ for each $i = 0 \dots N - 1$.
- Best-friendship is symmetrical: $F_i = j$ if and only if $F_j = i$ for each $i, j = 0 \dots N - 1$.
- N is even and no student is best friend of himself: $F_i \neq i$ for each $i = 0 \dots N - 1$.



Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** [5 points]: Examples.
- **Subtask 2** [10 points]: $K = 1$.
- **Subtask 3** [25 points]: $K \leq 3$.
- **Subtask 4** [20 points]: $N \leq 10$.
- **Subtask 5** [20 points]: $N \leq 100$.
- **Subtask 6** [20 points]: No additional limitations.

Examples

input.txt	output.txt
4 1 2 20 15 3 70 0 0 10 10 1 50 0	70
6 3 2 40 30 4 90 70 0 75 10 5 20 0 1 80 80 3 50 50	225

Explanation

In the **first sample case**, the single best student is number 1.

In the **second sample case**, the best team consists of students 1, 2 and 4 for a total of $70 + 75 + 80 = 225$ points (since 1 and 4 are best friends). The best team avoiding friendships would instead be 1, 2 and 5 scoring $90 + 75 + 50 = 215$ points.