[Мыкты]Жол төлөөлөрү

Жапанда, шаарлар Жолдордун тору менен байланган. Бул тор N шаардан жана M Жолдон турган. Ар бир Жол эки ар түрдүү шаарды байлайт. Каалаган эки шаар эки Жолго ээ болууга болбойт. Шаарлар 0дөн $(N-1)$ге дейре номурланган, ал эми Жолдор 0дөн $(M-1)$ге дейре номурланган. Жолдо экөө багыттарга баруу мүмкүн. Ар бир шаардан ар бир башка шаарга Жолдор аркылуу өтүш мүмкүн.

Ар бир Жолдо барууга төлөш керек. Жолдун төлөөсү Жолдун **бара-жүрүү** шарты менен аныкталат. Бара-жүрүү **жеңил** же **оор** болуш мүмкүн. Бара-жүрүү жеңил болсо, төлөөсү A йена (Жапан акчасы). Бара-жүрүү оор болсо, төлөөсү A йена($A < B$). A жана B маанилерин билесиң.

Сенде "машина" бар. Ал машина бардык Жолдун бара-жүрүү шарттары боюнча, "бара-жүрүү-атайын-шарттары"на баш ийип, S-инчи шаардан T-инчи шаарга ($S \neq T$) өтүүнүн эң аз мүмкүн болгон төлөөсүн эсептейт.

Бирок, ал машина даяр боло элек. Sтин жана Tдин маанилери туруктуу (б.а., машинада бекитилген) жана сага белгисиз. Сен Sти жана Tди аныктагың келет.

Муну үчүн, сен машинага бир канча бара-жүрүү-атайын-шарттарын билдирип, машина чыгарган төлөө маанилерин колдонуп, Sти жана Tди чечкиң келет.

Бара-жүрүү-атайын-шарттарын билдирүүнүн баасы бар экен, ошондуктан машинаны көп жолу колдонгуң келбейт.

Implementation details

You should implement the following procedure (аты: жубайды-тап):

```
find_pair(int N, int[] U, int[] V, int A, int B)
```

- `N`: the number of cities.
- `U` and `V`: arrays of length M, where M is the number of highways connecting cities. For each i $(0 \leq i \leq M-1)$, the highway i connects the cities `U[i]` and `V[i]`.
- `A`: the toll for a highway when the traffic is light.
- `B`: the toll for a highway when the traffic is heavy.
- This procedure is called exactly once for each test case.
- Note that the value of M is the lengths of the arrays, and can be obtained as

indicated in the implementation notice.

The procedure `find_pair` can call the following function:

```
int64 ask(int[] w)
```

- The length of `w` must be M. The array `w` describes the traffic conditions.
- For each i ($0 \leq i \leq M-1$), `w[i]` gives the traffic condition on the highway i. The value of `w[i]` must be either 0 or 1.
  - `w[i] = 0` means the traffic of the highway i is light.
  - `w[i] = 1` means the traffic of the highway i is heavy.
- This function returns the smallest total toll for travelling between the cities S and T, under the traffic conditions specified by `w`.
- This function can be called at most 100 times (for each test case).

`find_pair` should call the following procedure to report the answer:

```
answer(int s, int t)
```

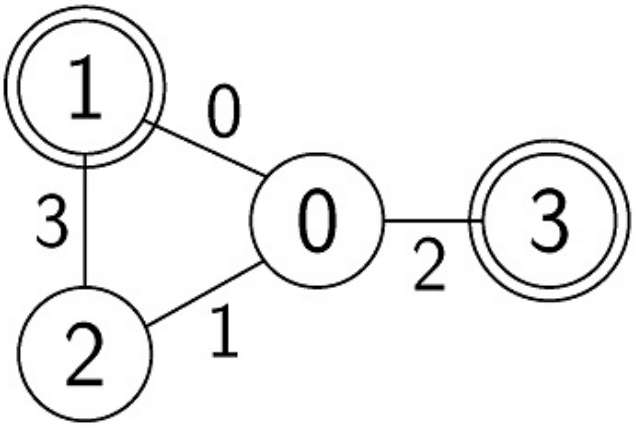
- `s` and `t` must be the pair S and T (the order does not matter).
- This procedure must be called exactly once.

If some of the above conditions are not satisfied, your program is judged as **`Wrong Answer`**. Otherwise, your program is judged as **`Accepted`** and your score is calculated by the number of calls to `ask` (see Subtasks).

Example

Let $N = 4$, $M = 4$, $U = [0, 0, 0, 1]$, $V = [1, 2, 3, 2]$, $A = 1$, $B = 3$, $S = 1$, and $T = 3$.

The grader calls `find_pair(4, [0, 0, 0, 1], [1, 2, 3, 2], 1, 3)`.



Some possible calls to `ask` and the corresponding return values are listed below:

Call	Return
`ask([0, 0, 0, 0])`	2
`ask([0, 1, 1, 0])`	4
`ask([1, 0, 1, 0])`	5
`ask([1, 1, 1, 1])`	6

For the function call `ask([0, 0, 0, 0])`, the traffic of every highway is light and the toll for it is 1. The cheapest route from $S = 1$ to $T = 3$ is $1 \to 0 \to 3$. The total toll for this path is 2. Thus, this function returns 2.

For a correct answer, the procedure `find_pair` should call `answer(1, 3)` or `answer(3, 1)`.

The file `sample-01-in.txt` in the zipped attachment package corresponds to this example. Other sample inputs are also available in the package.

Constraints

- $2 \leq N \leq 90\,000$
- $1 \leq M \leq 130\,000$
- $1 \leq A < B \leq 1\,000\,000\,000$
- For each $0 \leq i \leq M - 1$
  - $0 \leq U[i] \leq N - 1$
  - $0 \leq V[i] \leq N - 1$
  - $U[i] \neq V[i]$
- $(U[i], V[i]) \neq (U[j], V[j])$ and $(U[i], V[i]) \neq (V[j], U[j])$ $(0 \leq i < j \leq M - 1)$
- You can travel from any city to any other city by using the highways.
- $0 \leq S \leq N - 1$
- $0 \leq T \leq N - 1$
- $S \neq T$

In this problem, the grader is NOT adaptive. This means that S and T are fixed at the beginning of the running of the grader and they do not depend on the queries asked by your solution.

Subtasks

1. (5 points) one of S or T is 0, $N \leq 100$, $M = N - 1$
2. (7 points) one of S or T is 0, $M = N - 1$
3. (6 points) $M = N - 1$, $U[i] = i$, $V[i] = i + 1$ $(0 \leq i \leq M - 1)$
4. (33 points) $M = N - 1$
5. (18 points) $A = 1$, $B = 2$

6. (31 points) No additional constraints

Assume your program is judged as **`Accepted`**, and make X calls to `ask`. Then your score P for the test case, depending on its subtask number, is calculated as follows:

- Subtask 1. $P = 5$.
- Subtask 2. If $X \leq 60$, $P = 7$. Otherwise $P = 0$.
- Subtask 3. If $X \leq 60$, $P = 6$. Otherwise $P = 0$.
- Subtask 4. If $X \leq 60$, $P = 33$. Otherwise $P = 0$.
- Subtask 5. If $X \leq 52$, $P = 18$. Otherwise $P = 0$.
- Subtask 6.
  - If $X \leq 50$, $P = 31$.
  - If $51 \leq X \leq 52$, $P = 21$.
  - If $53 \leq X$, $P = 0$.

Note that your score for each subtask is the minimum of the scores for the test cases in the subtask.

Sample grader

The sample grader reads the input in the following format:

- line 1: $N\ M\ A\ B\ S\ T$
- line $2 + i$ ($0 \leq i \leq M - 1$): $U[i]\ V[i]$

If your program is judged as **`Accepted`**, the sample grader prints `Accepted: q`, with `q` the number of calls to `ask`.

If your program is judged as **`Wrong Answer`**, it prints `Wrong Answer: MSG`, where `MSG` is one of:

- `answered not exactly once`: The procedure `answer` was not called exactly once.
- `w is invalid`: The length of `w` given to `ask` is not M or `w[i]` is neither 0 nor 1 for some i ($0 \leq i \leq M - 1$).
- `more than 100 calls to ask`: The function `ask` is called more than 100 times.
- `{s, t} is wrong`: The procedure `answer` is called with an incorrect pair `s` and `t`.