

Magic City

Meya wa Tashkent arashaka kuvugurura pariki izwi cyane y'imyidagaduro ya Magic City. Uhabwa integer iri positive K kandi inshingano yawe ni ugushushanya pariki yujuje ibisabwa bikurikira:

- Choose an integer N , the number of attractions, and label the attractions with integers from 0 to $N - 1$.
- Kuri buri i nk'uko $0 \leq i < N$, shyira attraction i ubwoko $T[i]$. Hari ubwoko bwa $2K$ bufite imibare kuva kuri 0 kugeza kuri $2K - 1$. Ubwoko bwose bugomba gushyirwaho atleast one attraction. Different attractions may have the same type.
- Ongeraho inzira z'abanyamaguru zo mu cyerekezo cy'imirongo ibiri hagati y'ahantu hatandukanye hakurura abantu. Ntabwo ari ngombwa kuba ushobora kugenda hagati y'ahantu habiri hakurura abantu ukoresheje inzira z'abanyamaguru.**

Ubushakashatsi ku isoko bwagaragaje ko:

1. Buri mushyitsi akunda gusura ahantu nyaburanga hatatu nyaburanga hatabayeho gusura ahantu nyaburanga habiri h'ubwoko bumwe bukurikanye.
2. Abashyitsi ntibakunda ahantu nyaburanga hakunze kugaragara inzira nyinshi zo kunyuramo.

Kugira ngo ushimishe abashyitsi **bose** bashobora kuza, umuyobozi w'umuji ashahiraho ibintu bibiri ku gishushanyo mbonera cyawe.

Twita ubwoko butatu bwa **ubwoko** (t_1, t_2, t_3) kuri $0 \leq t_1, t_2, t_3 < 2K$ **birashishikaje** niba $t_1 \neq t_2$ na $t_2 \neq t_3$. Menya ko t_1 ishobora kungana na t_3 . Bityo, hari $2K \cdot (2K - 1)^2$ triples zishimishije.

Imiterere ya 1: Kuri buri nshuro eshatu zishimishije (t_1, t_2, t_3) , hagomba kubaho ahantu hatatu hakurura a_1, a_2, a_3 (hamwe na $0 \leq a_1, a_2, a_3 < N$) ku buryo:

- Ubwoko bwa a_1, a_2, a_3 buhuye na t_1, t_2, t_3 . Ni ukuvuga, $T[a_1] = t_1$, $T[a_2] = t_2$, na $T[a_3] = t_3$.
- Hari inzira y'abanyamaguru iri hagati ya a_1 na a_2 .
- Hari inzira y'abanyamaguru iri hagati ya a_2 na a_3 .

Ntacyo bitwaye niba hari inzira y'abanyamaguru iri hagati ya a_1 na a_3 . Menya kandi ko iyo $t_1 = t_3$, ahantu nyaburanga a_1 na a_3 hashobora kuba ari hamwe.

Imiterere ya 2: Buri hantu hakurura abantu hashobora kuba iherezaho rya **ntarengwa** K * inzira z'abanyamaguru.

Iki gikorwa kigizwe n'imirimo mito ya 50 **umusaruro gusa** hamwe n'amanota make**.

Buri gikorwa gito gihuye n'agaciro ka K , kandi ugomba gushushanya pariki yujuje ibisabwa byose byavuzwe haruguru kuri ako gaciro ka K . Amanota yawe aterwa n'umubare w'ibintu bikurura abantu mu gisubizo cyawe - ibintu bikurura abantu bake bitanga amanota menshi cyangwa angana.

Implementation Details

Hari uburyo bubiri bwo gutanga igisubizo cyawe, kandi ushobora gukoresha bumwe muri buri gikorwa gito:

- **Procedure call**
- **Output file**

Kugira ngo woherenze igisubizo cyawe ukoresheje **procedure call**, ugomba gushyira mu bikorwa uburyo bukurikira:

```
std::pair<std::vector<int>,std::vector<std::pair<int, int>>>  
construct(int K)
```

K : kimwe cya kabiri cy'ubwoko bw'ahantu nyaburanga hakururwa, ndetse n'umubare ntarengwa w'inzira z'abanyamaguru buri hantu nyaburanga hashobora kuba iherezaho ryaho.

- Ubu buryo bwitwa rimwe gusa kuri buri gikorwa gito.

Uburyo bugomba gusubiza (T, E) ebyiri zisobanura pariki y'imyidagaduro. Reka M ibe umubare w'inzira zo kunyuramo muri pariki yawe.

- T : array ya lenght N isobanura ubwoko bw'ibintu bikurura abantu.
- E : array ya lenght M isobanura inzira z'abanyamaguru. Kuri buri $0 \leq j < M$, $E[j] = (U[j], V[j])$ igaragaza inzira y'abanyamaguru y'icyerekezo kibiri hagati y'ahantu hatandukanye $U[j]$ na $V[j]$. Yemerewe kugira inzira zirenze imwe hagati y'ahantu habiri hatandukanye.

Kugira ngo woherenze igisubizo cyawe ukoresheje **dosiye yo gusohora**, kora kandi woherenze dosiye y'inyandiko muri ubu buryo bukurikira:

```
N M  
T[0] T[1] ... T[N-1]  
U[0] V[0]  
U[1] V[1]  
...  
U[M-1] V[M-1]
```

Menya ko igisubizo cyawe kigomba kuba cyujuje ibi bikurikira kugira ngo gifatwe nk'icyemewe**:

- $N \leq 2000$
- $0 \leq T[i] < 2K$ kuri buri $0 \leq i < N$, kandi buri bwoko bugomba gushyirwaho nibura ahantu hamwe ho gukurura abantu.
- $0 \leq U[j], V[j] < N$ na $U[j] \neq V[j]$ kuri buri $0 \leq j < M$.
- Ibisabwa 1 na 2 bigomba kubahirizwa.

Constraints

- $1 \leq K \leq 50$

Scoring

There are 50 subtasks, one for each integer K from 1 to 50. For Subtask i ($1 \leq i \leq 50$), the value of K is i .

Each subtask has a score S and a target number of attractions P according to the table below.

Subtasks	S	P
1	1	2
2	8	12
3	9	24
4	9	40
5	9	50
6 - 10	4	$12 \cdot K$
11 - 12	3	$12 \cdot K$
13 - 50	1	$12 \cdot K$

For each subtask, if your solution does not describe a valid amusement park, then the score of your solution will be 0 (reported as `Output isn't correct` in CMS).

Otherwise, your score is calculated based on N and the parameters S and P as follows:

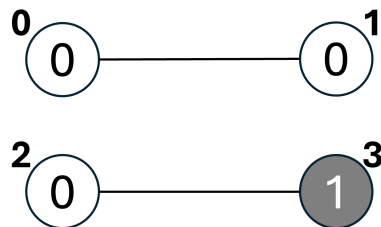
Condition	Score
$N \leq P$	S
$P < N \leq 2P$	$(0.4 + 0.3 \cdot \frac{2P-N}{P}) \cdot S$
$2P < N \leq 2000$	$(0.1 + 0.3 \cdot \frac{2P}{N}) \cdot S$

Example

Consider the following call:

```
construct(1)
```

Muri uru rugero, $K = 1$, bityo hari ubwoko bwa $2K = 2$ bw'ibintu bikurura abantu. Ishusho iri hepfo igaragaza igisubizo cyemewe gifite $N = 4$ ahantu nyaburanga na $M = 2$ inzira z'abanyamaguru. Ibikurura 0, 1, 2 ni iby'ubwoko 0, naho ibikurura 3 ni iby'ubwoko 1.



Hari ibice bibiri bishimishije by'abantu batatu:

- Ku bwoko bwa triple $(0, 1, 0)$, dushobora guhitamo $(a_1, a_2, a_3) = (2, 3, 2)$.
- Ku bwoko bwa triple $(1, 0, 1)$, dushobora guhitamo $(a_1, a_2, a_3) = (3, 2, 3)$.

Ibi bivuze ko Imiterere ya 1 yujuje ibisabwa.

Uburyo bushobora gusubiza ifaranga $([0, 0, 0, 1], [(0, 1), (2, 3)])$. Menya ko igisubizo cyatanze kuri uru rugero gishobora kuba kidakwiye kuri $K = 1$.

Sample Grader

Input format:

```
K
```

Output format:

```
N M
T[0] T[1] ... T[N-1]
U[0] V[0]
U[1] V[1]
...
U[M-1] V[M-1]
```

Menya ko umusaruro w'icyitegererezo uhuye n'imiterere isabwa kuri dosiye isohoka.