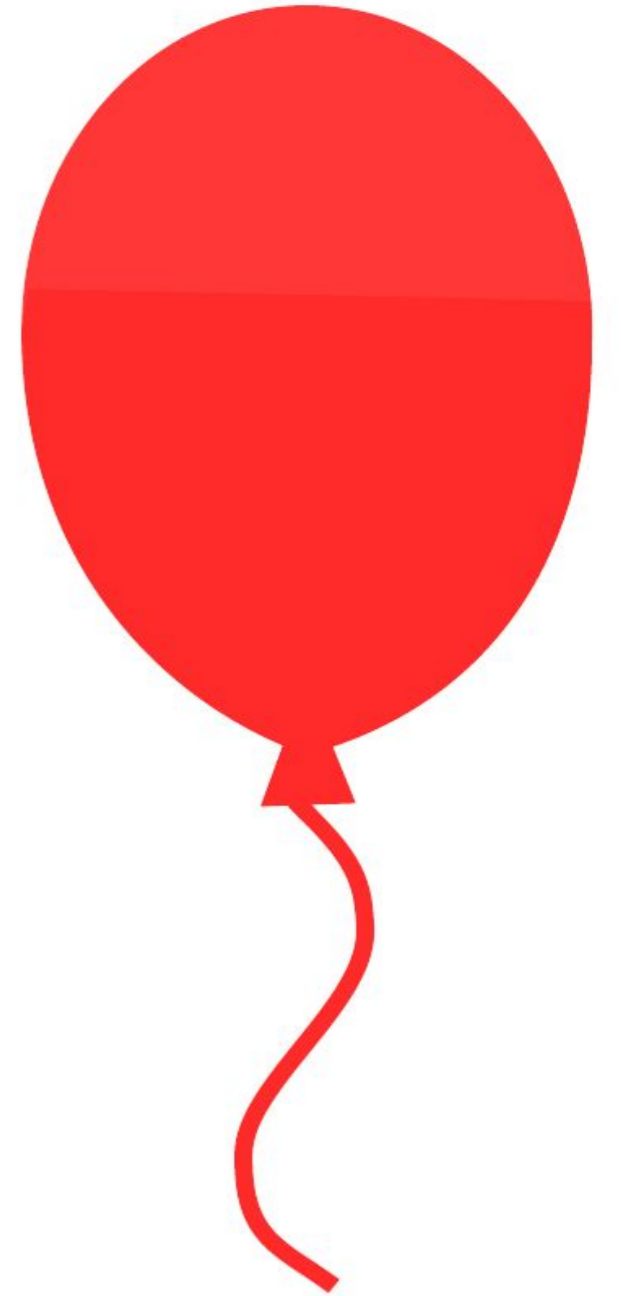


marathon

USP



O que é a Maratona?

- Resolver problemas
- Trabalhar em equipe
- Código rápido e preciso
- Ganhar balão



Maratona de
Programação

Exemplos de Problema

Busca Binária



Busca Binária

- Busca em lista ordenada
 - E se bilhões de números?

Binary search

You are given a sorted array of numbers, and followed by number of queries, for each query if the queried number is present in the array print its position, else print -1.

Input

First line contains N Q, number of elements in the array and number of queries to follow,

Second line contains N numbers, elements of the array, each number will be $-10^9 \leq a_i \leq 10^9$,
 $0 < N \leq 10^5$, $0 < Q \leq 5 \cdot 10^5$

Output

For each element in the query, print the elements 0 based location of its first occurrence, if present, otherwise print -1.

Example

Input:

5 4

2 4 7 7 9

7

10

4

2

Output:

2

-1

1

0

Como funciona?

- Diversos problemas
- Duração de 5 horas
- Times de 3 pessoas
- Apenas 1 computador
- Correção em tempo real
- Ganha quem resolve mais
- Desempate por tempo
- 1 Acerto = 1 Balão

Como funciona?

#	User/Site	Name	A	B	C	D	E	F	G	H	I	J	K	L	M	Total
1	teambrbr7/BR	[UFPE] Amigos de Yuki U·x·U		1/253				1/17		1/141	2/67	3/124	1/10	1/200	1/85	8 (957)
2	teambrbr2/BR	[UFMG] Summergimurne?	2/-	5/-				1/23		1/115	2/97	1/94	2/12		1/54	6 (435)
3	teambrbr1/BR	[IMPA] Last Chance		8/-				2/34		3/156	2/111	1/129	1/16		1/54	6 (580)
4	teambrbr6/BR	[USP - São Carlos] gramando no deitado						1/25		1/111	2/83	2/168	1/10		3/159	6 (636)
5	teambrbr5/BR	[USP] Hoje tem 'In queue' do Ribamar						1/22		3/200	1/49	2/148	1/12	4/-	3/108	6 (639)
6	teambrbr13/BR	[UFCG] O amarelo foi ejetado	4/-					1/10		2/203	1/96	1/74	1/15		4/164	6 (642)
7	teambrbr14/BR	[UFRJ] desCE ouTro BaLÃO, MelAnCia!!@!1!						3/37		1/166	1/136	3/214	1/9	6/-	1/104	6 (746)
8	teambrbr18/BR	[UFMG] Guloso k-dimensional						1/23		1/169	2/75	2/123	1/14		3/278	6 (762)
9	teambrbr15/BR	[UNICAMP] Moratonistas			2/272	6/-		1/20		2/-	1/87	1/59	3/18		4/187	6 (763)
10	teambrbr10/BR	[UFRN] SegTreeste e Persistente						1/27		1/181	1/103	3/114	2/9		2/255	6 (769)
11	teambrbr4/BR	[IME] Nada é trivial	4/-					1/31		1/107	1/230	1/148	1/9		4/205	6 (790)
12	teambrbr12/BR	[USP - São Carlos] Se der bom não pergunta como						1/44		1/228	1/80	1/180	1/27		3/223	6 (822)
13	teambrbr19/BR	[UnB] Posso mandar um WA?	2/-					2/54		3/228	1/73	1/138	3/16		3/190	6 (839)
14	teambrbr16/BR	[ITA] GGH						1/92		1/252	3/135	1/76	3/44		2/191	6 (890)
15	teambrbr3/BR	[USP] Zikados				2/245		1/20		1/244	1/66	8/279	1/12		6/-	6 (1026)
16	teambrbr11/BR	[UFC-Quixadá] two thousands rubles trap						2/68		3/100	3/125	1/133	2/21		10/289	6 (1036)
17	teambrbr33/BR	[FACOM - UFMS] print "Batatinha Frita", 1, 2, 3						1/30		2/265	1/132	1/183	1/16		3/-	5 (646)
18	teambrbr31/BR	[UFG] Monkeys: Rubiataba Edition						1/66		3/227	7/257	1/165	5/83		7/-	5 (1038)
19	teambrbr8/BR	[UFBA] SQLados						1/28		1/-	3/153	1/129	1/22		4/-	4 (372)
20	teambrbr23/BR	[UFAM] Tuturu sem O(1)						1/44		4/210	2/74		1/14		3/-	4 (422)
21	teambrbr36/BR	[UNIVASF] Team A UNIVASF						1/146			1/57	1/211	1/32		3/-	4 (446)

Etapas

- Seletiva Interna
- Sub-regional
- Final Brasileira
- Final LATAM
- Final Mundial (ACM-ICPC)







acm Programming Contest
IBM event sponsor

Finals
UFGU

acm International Collegiate Programming Contest

ДИВС
роботы видов спорта

В

2014 ACM ICPC World Finals - Ekaterinburg
Renmin University of China
572014 ACM ICPC World Finals - Ekaterinburg
University of Tokyo
72
2014 ACM ICPC World Finals - Ekaterinburg
Tishreen University
74
2014 ACM ICPC World Finals - Ekaterinburg
The University of Waikato
73
2014 ACM ICPC World Finals - Ekaterinburg
Tokyo Institute of Technology
75
2014 ACM ICPC World Finals - Ekaterinburg
Tsinghua University
76
2014 ACM ICPC World Finals - Ekaterinburg
University of Waikato
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2014 ACM ICPC World Finals - Ekaterinburg
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2014 ACM ICPC World Finals - Ekaterinburg
University of Waikato
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2014 ACM ICPC World Finals - Ekaterinburg
University of Waikato
100

O que é o MaratonUSP?

- Grupo de estudos para Maratonas de programação (que também ajudam para outras competições como Codeforces, Facebook Hacker Cup, Huawei e OBI)
- Organizamos:
 - Simulados
 - Listas
 - Aulas
 - Mashups
 - Rolês ~muito~ intensos (...)

Por que fazer parte?











Instituto Militar de Engenharia 26

Universidade de São Paulo 73

Instituto Tecnológico de Aeronautica 27

University of Campinas 79

ACM-ICPC World Finals

IBM
CIVIC
Symposium on Large Scale Data Mining

IBM

IBM

IBM

IBM

IBM



J	K	Solved	Time
6		6	562
6		6	573
6		6	618
6		6	674
6		6	800
6		6	804
6		6	871
5		5	403
5		5	405
5		5	523
5		5	591
5		5	602
5		5	603
5		5	630
5		5	631
5		5	673
5		5	721
5		5	811
5		5	899
4		4	351
4		4	362

Rank 37   Universidade de São Paulo - Instituto de Matemática e Estatística

Solved 4 Score 675

A B 3 D 3 F G H I 5 4







Programming > Binary Search > Square Root Of Integer

Description Problem Discussion Solution Discussion

Square Root of Integer

Medium

↑ 19

↓ 6

♥ Add to favorites

Asked In:

FACEBOOK

AMAZON

MICROSOFT

Given an integer **A**.

Compute and return the **square root of A**.

If **A** is not a perfect square, return **floor(sqrt(A))**.

DO NOT USE SQRT FUNCTION FROM STANDARD LIBRARY

Input Format

The first and only argument given is the integer **A**.

Output Format

Return **floor(sqrt(A))**

Constraints

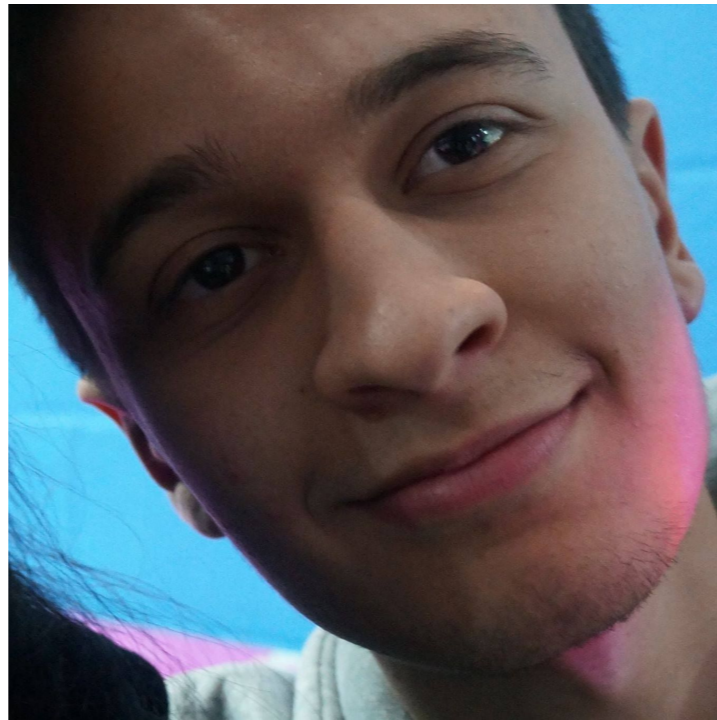
$1 \leq A \leq 10^9$

🕒 02:33:34

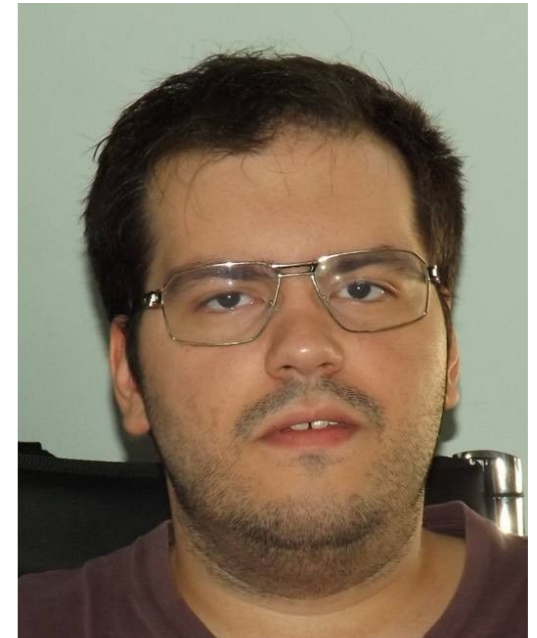
C++17 (Gcc-9.2)

```
1 int Solution::sqrt(int A) {
2 }
3
```


Palantir



Facebook – São Paulo



Facebook – Londres



VTEX

B2W



Alura





Hong Kong

UFABC

IME-USP

Waterloo



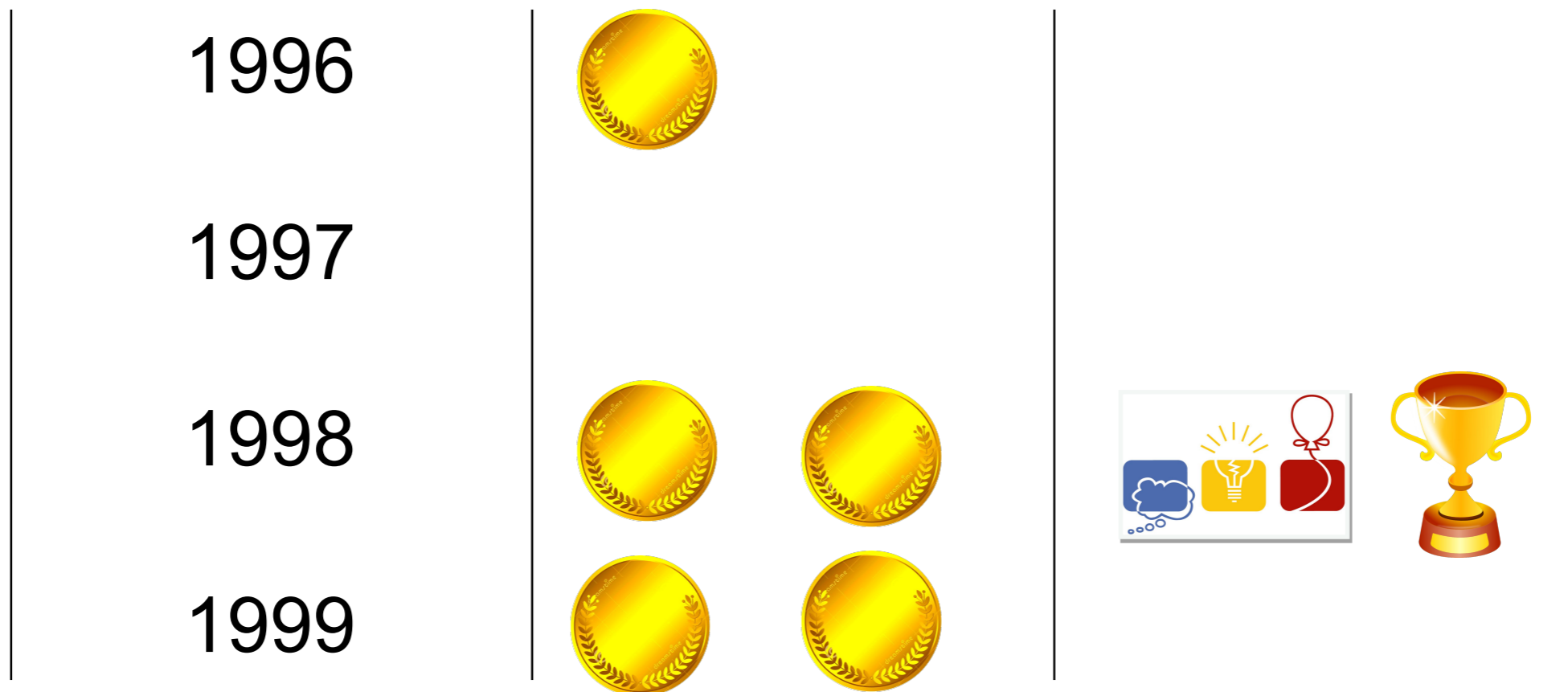


maraton
USP 

Show off



IME na Maratona



IME na Maratona

2000



2001



2002



2003
















2004



















2005













IME na Maratona

2006		
2007		
2008	 	
2009		
2010	 	
2011		

IME na Maratona

2012				
2013	 			
2014	 Maratona de Programação			
2015				
2016				
2017	 Maratona de Programação			
2018	 			

IME na Maratona

2019	 Maratona de Programação			
2020				
2021				
2022				



2014, Ecaterimburgo, Russia



2015, Marrakesh, Marrocos



2016, Phuket, Tailândia



2018, Pequim, China



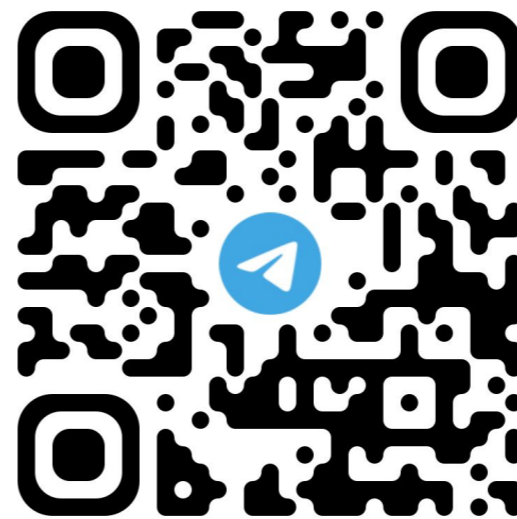
2021, Moscow, Russia



2022, Dakha, Bangladesh

Fale conosco

- Acesse: www.ime.usp.br/~maratona
- Curta: fb.com/maratonUSP/
- Converse pelo Telegram:



Fale conosco

