

Cisco Cracker Sheet

- By Sunyul Hossen

Note: [To Use this sheet optimally go and watch the "Cracking the Cisco coding interview 🔥 : The definitive prep guide" video on Debug Buzz Channel.

Link - <https://youtu.be/3z-8-VmZT2Q>]

Q) 18th August, 2022

Given a linkedlist, check if it is Palindrome or Not.

Q) 18th August, 2022

Minimum moves required to Sort array. All evens on one side and All odds on one side.

Q) 18th August, 2022

Subtract two numbers represented as Linked lists. ex: (1->0->0->0) - (1->0->0) = 9->0->0.

Q) 12th August, 2022

Magic Stick

You have n magic sticks. In a magic stick, you can either increase or decrease the length of the stick but every time you increase or decrease one unit of the stick, it will cost you.

You want to convert all the sticks to equal length. Calculate the minimum cost of making the sticks of equal length.

Input Specification:

input1: n , number of magic sticks

input2: An array containing length of each magic stick

input3: An array containing the cost of increasing or decreasing one unit length of i^{th} stick

Output Specification:

Return the minimum cost of making all sticks of an equal length

Example 1:

input1: 2

input2: {1,2}

Example 1:

input1: 2
input2: {1,2}
input3: {10,20}

input3: {10,20}

Output: 10

Explanation:

To make equal length of size 1, the total cost is 20.

To make equal length of size 2, the cost is 10.

So, the minimum cost is 10.

Example 2:

input1: 3
input2: {1,2,3}
input3: {20,30,40}

Example 2:

input1: 3
input2: {1,2,3}
input3: {20,30,40}

Output: 60

Explanation:

To make equal length of size 1, the total cost is $(1-1)*20+(2-1)*30+(3-1)*40=110$.

To make equal length of size 2, the total cost is $(2-1)*20+(2-2)*30+(3-2)*40=60$.

To make equal length of size 3, the total cost is $(3-1)*20+(3-2)*30+(3-3)*40=70$.

So, the minimum cost is 60.

Q) 6th August, 2022

N devices are connected via cables in a computer network. Every cable has some cost of transmission of data between the devices associated with it. The devices are identified with unique ID from 1 to N. During the upgradation of transmission media, the network administrator installed wireless transmission media between some devices in the network due to which the cost of the transmission of data has been changed. The transmission of data between the devices is bi-directional. The network administrator wants to check the sum of minimum cost of transmission between each pair of devices after the installation of new wireless transmission media between a pair of devices.

Question

Write an algorithm to find the sum of minimum cost of transmission between each pair of devices after the installation of new wireless transmission media between a pair of devices.

Input

The first line of the input consists of an integer *num*, representing number of devices in the network (N).

The next N lines consist of N space-separated integers, representing the matrix *transmissionCost* where *transmissionCost*[i, j] is the cost of transmission between directly connected devices with IDs i+1 and j+1.

The (N+1)th line consists of an integer *newWirelessCount*, representing the number of new wireless transmission media installed (M).

The next M lines consist of three space-separated integers - *firstDevice*, *secondDevice* and *cost*, representing the first device, the second device and the cost of transmission on the new wireless transmission media installed between the given pair of devices, respectively.

Output

Print M space-separated integers representing the sum of minimum cost of transmission between each pair of devices after the installation of new wireless transmission media between a pair of devices.

Constraints

$2 \leq num \leq 300$
 $1 \leq transmissionCost[i, j] \leq 1000$, where $i \neq j$
 $transmissionCost[i][j] = 10^9 + 7$ if the devices i+1 and j+1 are not directly connected
 $0 \leq i, j < num$
 $1 \leq newWirelessCount \leq 300$
 $1 \leq firstDevice, secondDevice \leq num$
 $1 \leq cost \leq 1000$

Note

Initially, the devices may or may not be connected by cables.

Example

Input:

```
2
0 3
3 0
2
1 2 2
1 2 1
```

Output:

```
2 1
```

Q) 4th August, 2022



41. Mail Rooms for Office Buildings

ALL

Problem ::

Company ABC has corporate campus with multiple buildings. These buildings may or may not be connected to one other.



Goal ::

Please help Alisa determine the least number of mail rooms to be setup so that all buildings are serviced with the following considerations.

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Constraints ::

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1. A building can host only 1 mail room

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2. A building having a mail room will also service buildings directly connected to it. Hence those directly connected buildings may not host a mail room unless required otherwise.

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3. A building may or may not be connected to other buildings. In such a case, it would need its own mail room.

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4. The number of each building X is a random integer where $0 <= X <= 10^4$

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5. Total number of buildings is P where $0 <= P <= 10^4$

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6. Number of connections is N such that $0 <= N <= 1000$

```

1 > #!/bin/python3...
10
11 #
12 # Complete the 'NumberOfMailRooms' function below.
13 #
14 # The function is expected to return an INTEGER.
15 # The function accepts following parameters:
16 # 1. INTEGER NumBldgs
17 # 2. INTEGER Connections
18 # 3. INTEGER_ARRAY BldgX
19 # 4. INTEGER_ARRAY BldgY
20 #
21
22 def NumberOfMailRooms(NumBldgs, Connections, BldgX, BldgY):
23
24     # Write your code here
25
26
27
28
29
30
31
32
33 > if __name__ == '__main__':...
```

ALL

Inputs ::

First line contains integer P i.e. total number of buildings in Campus.

Second line contains integer N i.e numbers of connections. Here each connection is represented as "X Y" eg "10 20" i.e. link between Bldg 10 and Bldg 20

Next N lines contain the first building connected by the link i.e. 10. The other endpoint would be at index of current line + N.

Next N lines contain the second building connected by the link i.e. 20

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Output ::

Number indicating minimum number of mail rooms needed.

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Example 1 :

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Input :

3

2

38

1

2

2

39

3

40

Output :

1

Explanation :



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The 3 (line 1) buildings are connected over 2 (line 2) links as follows. Bldg 1 (line 3) is connected to bldg 2 (line 5) and Bldg 2 (line 4) is connected to Bldg 3 (line 6). In this case, placing mail room in Building 2 serves all three. So, answer is 1.

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ALL

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Example 2 :

Input :

6
5
1
2
2
4
5
2
3
5
5
6

Output :

2

Explanation :

The buildings are connected as follows. In this case, minimum mail rooms needed would be 2 i.e. at 2 and 5.

```
graph LR; 1 --- 2 --- 3; 4 --- 5 --- 6; 2 --- 5;
```

Q) 4th August, 2022

42. Cheap Airfare



ALL

Problem Statement

Anjali has started a new travel agency. She noticed that the air fares between the cities are not symmetrical. That is, the cost of flying from a to b is not the same as that of b to a. Further, there is no guarantee that once you fly directly from a to b there is a direct return flight.



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She knows that passengers do not mind changing flights as long as the total airfare is minimized. She needs to advertise the lowest round trip cost between any pair of cities of tourist interest to attract potential passengers. All valid flights i.e. $(A, B, P(A,B))$ where A is the source city of tourist interest, B is the destination city of tourist interest and $P(A,B)$ is the price of the ticket.

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You must help her determine the lowest round trip cost & the cities involved.

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Input Format

The first line consists of integer n indicating the number of cities

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The second line consists of integer m indicating the number of flights

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Each of the next 'm' lines contains 3 integers separated by a space - starting city A, end city B and the price of the ticket $P(A,B)$ for flight from A to B.

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Constraints

1 < Number of cities < 100

0 < Number of flights < 5000

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0 < Price < 10000

40

Output Format

Return an array of 3 integers. 1st integer is the price for the cheapest round trip. 2nd and 3rd integers are the city indices involved in increasing order.

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If there is no round trip available, return 1000000, -1 and -1.

If there are multiple pair of cities with lowest round trip fair, please select the pair with the lowest sum of their indices.

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Language Python 3

```

1 > #!/bin/python3...
10
11 #
12 # Complete the 'CheapestRoundTrip' function below.
13 #
14 # The function is expected to return an INTEGER_ARRAY.
15 # The function accepts following parameters:
16 # 1. INTEGER NumCities
17 # 2. 2D_INTEGER_ARRAY FlightInfo
18 #
19
20 def CheapestRoundTrip(NumCities, FlightInfo):
21     # Write your code here
22
23
24
25
26
27
28
29
30 > if __name__ == '__main__':...
```

Test Results

Custom Input

32 ^ **Sample Input 0**

4
6
0 1 20
1 0 20
1 2 10
2 0 10
1 3 30
3 2 30

33

34

35

Sample Output 0

40
0
1

36

37

Explanation 0

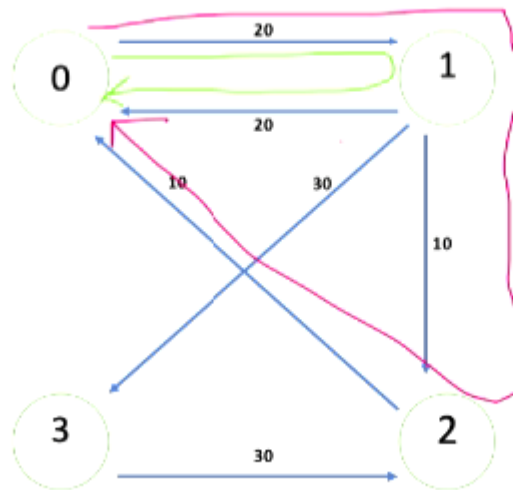
38

39

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The screenshot shows a problem solution for 'Cheapest Round Trip'. On the left, there is a graph with three nodes (0, 1, 2) and edges with weights. Node 0 is at the top, node 1 is at the bottom left, and node 2 is at the bottom right. Edges are: 0-1 (weight 10), 0-2 (weight 20), 1-2 (weight 30), 1-0 (weight 10), 2-0 (weight 10), and 2-1 (weight 30). A pink path is highlighted from 0 to 1 to 2 to 0.

Text explanation:

For example, Let us calculate the round trip between City 1 and City 3 i.e R(1,3)
 $Cost(1, 3) = P(1, 3) = 30$, because there are only one simple way to go to there.
 $Cost(3, 1) = P(3, 2) + P(2, 0) + P(0, 1) = 60$.
 So the cheapest round trip from City 1 and City 3 i.e R(1,3) is equal to $30 + 60 = 90$ units.
 We can calculate all the other round trip in the similar way, then we can get the answer which is R(0,1) i.e 40.
 There are 2 city pairs with the lowest cost (0,1) and (0,2).
 Lowest sum of indices belongs to (0,1) & hence 0 and 1 in alphanumeric order.

Sample Input 1
 3
 3
 0 1 100
 1 2 100
 0 2 100

Sample Output 1
 1000000
 -1
 -1

Explanation 1
 There is no return flights from any combination of cities. Hence the answers.

```

20 def CheapestRoundTrip(NumCities, FlightInfo):
21     # Write your code here
22     n=len(FlightInfo) #no of edges(flights)
23
24     #prices=[float("inf")]*len(FlightInfo)
25     #prices[src]=0
26     adj=collections.defaultdict(list)
27
28     for u,v,w in FlightInfo:
29         adj[u].append((v,w))
30
31     #print(adj)
32     vals=[]
33
34     for i in range(NumCities):
35         minheap=[(0,i)]
36
37         visit=set()
38         path=0
39         while(minheap):
40             w1,n1=heapq.heappop(minheap)
41
42             if n1 in visit:
43                 if n1==i:
44                     vals.append(w1)
45             visit.add(n1)
46             path=max(path,w1)
47
48             for n2,w2 in adj[i]:
49                 if n2 not in visit:
50                     heapq.heappush(minheap,(w2,n2))
51
52
53
54
55
56
57
58     #for i in range(n):

```

Q) 16th May, 2022

<https://leetcode.com/problems/rotate-image/>

Q) 16th May, 2022

<https://leetcode.com/problems/maximum-subarray/>

Q) 16th May, 2022

<https://leetcode.com/problems/validate-ip-address/>

Q) 8th May, 2022

You have 'x' jobs and 'y' manpower(workers). you are given three array; jobs, payment and manpower

where:

jobs[m] and payment[m] are the difficulty and the payment for the mth job and

manpower[n] is the capacity of nth worker(i.e nth worker can only complete a job with difficulty atmost manpower[n])

Every manpower can be assigned at most one job, but one job can be completed multiple times.

for example, if three manpower attempt the same jobs that pays \$2 then total profit will be \$6. if manpower cannot complete any jobs, their profit is \$0.

Return the maximum payment we can achieve after assigning manpower to the jobs.

Example:

input: jobs=[2,4,6,8,10], payment=[10,20,30,40,50], manpower=[4,5,6,7]

output:100

explanation: Manpowers are assigned jobs of difficulty [4,4,6,6] and they get payment of [20,20,30,30] separately.

example 2:

input: jobs=[85,47,57], payment=[24,66,99], manpower=[40,25,25]

output:0.

Q) 8th May, 2022

<https://leetcode.com/problems/stickers-to-spell-word/>

Q) 8th May, 2022

<https://leetcode.com/problems/friends-of-appropriate-ages/>

Q) 12th April, 2022

<https://leetcode.com/problems/decode-string/>

Q) 12th April, 2022

<https://leetcode.com/problems/maximum-subarray/>

Q) 12th April, 2022

Digitsum (range, K): ask for number of values, for which digitsum (e.g.: digitsum of 123 = 6) equals k.

Q) 9th March, 2022

given input M and N where n is length of string and m is index of lexicographical sorted set of strings.

return the string of index M in lexicographical sorted set of strings . if index m is greater than the length of set of string then return "Not possible"

ex

n=2,k=3

AA

AB

BA

return BA

n=2,k=4

AA

AB

BA

HENCE NOT POSSIBLE

Q) 9th March, 2022

C is number of cities F is number of flights. array A is given where A[0] is starting city A[1] is destination and A[2] is price to travel from starting to destination .

return the price of the top 2 cheapest round trips as array. if there no possible round trip return infinity .

test case

6

0 1 20

1 0 60

1 2 10

2 0 10

op -

40

40

Q) 9th March, 2022

Alice and her friends appeared in CISCO hackathon and they are very excited . In hackathon they have given a programming question on string in which Alice and her team needs to form a string of length n by using two characters 'A' and 'B' in which two consecutive B's are not allowed .

Alice can generate any string by using permutation and satisfying the above condition .

So, Alice and her team can make any number of strings but there is one more condition in which they need to sort all the possible strings in lexicographical order and they provide a string as output which comes at a particular index mentioned in question.

Input Format :

T - Test Cases

N - number of characters M - index

$1 \leq t \leq 10$

$1 \leq N \leq 100$

$1 \leq M \leq 10^9$

Input -

2

2 3

24

Output -

BA

Not possible

Q) 4th March, 2022

Convert Binary Numbers in Single Linked List to Number

Q) 4th March, 2022

Count the number of Sundays for a given year

Q) 4th March, 2022

Find circular primes less than n

Q) 4th March, 2022

Maximum length subsequence with difference between adjacent elements as either 0 or 1

Q) 4th March, 2022

Determines whether or not n is a perfect number

Q) 2nd March, 2022

For each element of an array, a counter is set to 0. The element is compared to each

element to its left. If the element to the left is greater, the absolute difference is subtracted

from the counter. If the element to the left is less, the absolute difference is added to the

counter. For each element of the array, determine the value of the counter. These values

should be stored in an array and returned.

e.g.

input

1,2,2,3

output

0,1,1,4

Cisco Interview Questions for Freshers

1. Explain the conditions for deadlock.
2. Define a firewall.
3. What is a Gateway?
4. What is routing?
5. Define OSI layers and tell us their functions.
6. Explain the differences between Switch, Routers, and Hub.
7. Explain the differences between half-duplex and full-duplex.
8. What will happen if you compile a C program?
9. What are the different routing protocols, and how do they work?
10. What is an IP address?

Cisco Interview Questions for Experienced Developers

1. Explain how you can use a linked list to simulate 3 TCP/IP packets.
2. Define a firewall. Explain what is the security level in an ASA firewall?
3. Static member in C++ -- what do you understand by this?
4. Define a transparent firewall.
5. If we declare union in C, how is the size of union allocated in the memory?
6. Define real-time OS and explain how it's different from other OS?
7. Define signal and interrupt handling.
8. What is Input and Output in a component?
9. What is the boundary problem in the allocation of the size of structures?
10. What is the difference between user and kernel space?

Cisco Interview Questions for Software Engineers

1. What is connection-oriented and connectionless transmission in the transport layer?
2. Explain OSI layers and their responsibility.
3. What is a multidimensional array, and what is a linked list? Explain the scenarios where you can use linked lists and arrays.
4. What are the differences between Static and Dynamic routing protocols?
5. What is ARP(Address Resolution Protocol), and how does it work?
6. How is a stack different from a queue?
7. Explain the difference between TCP and UDP with examples.
8. Given a string containing braces '{', '[', '(', ')', '}', ']'. Check if the string is balanced. If yes, return how many braces there are and if not return -1;
9. Given the position of 2 queens on a chessboard, determine if they can attack each other.
10. What do you understand about the sliding window protocol?

Cisco Data Engineer Interview Questions

1. Talk about the XML configuration files in Hadoop.
2. What are the various steps to employ a big data solution?
3. Explain replication factors in HDFS.
4. Have you ever built data systems using the Hadoop framework?
5. What is Hadoop?
6. What are the differences between structured and unstructured data?
7. What are the differences between NVL and NVL2?
8. What is data partitioning and when should you use it?
9. Explain Snowflake in brief. How does it vary from Star Schema?
10. What is the meaning of FSCK?

Cisco DevOps Interview Questions

- 1. Why is configuration management important in DevOps?**
- 2. How do open-source tools boost DevOps?**
- 3. Describe the advantages of Forking Workflow over other Git workflows?**
- 4. What are continuous testing and automation testing?**
- 5. What is the difference between DevOps and Agile?**
- 6. Explain some of the key performance indicators that can help measure the success of your DevOps efforts.**
- 7. What are the various tools used in DevOps?**
- 8. How is DevOps different from NetOps?**
- 9. How will you create a backup and copy files in Jenkins?**
- 10. How will you launch a browser using WebDriver?**