



CODECHEF-VIT NEWSLETTER

COMPETITIVE EDGE

INTERVIEW Q & A

Q) Two linked lists L1 and L2 intersects at a particular node N1 and from there all other nodes till the end are common. The length of the lists are not same. What are the possibilities to find N1?

- Solution exist for certain cases only
- No linear solution exist
- Linear solution is possible
- Only Non-linear solution exist.

Solution: c. Linear solution is possible

Have two pointers say P1 pointing to the first node of L1 and P2 to that of L2. Traverse through both the lists. If P1 reaches L1's last node, point it to the first node of L2 and continue traversing. Do the same thing for P2 when it reaches L2's last node. (By doing this, we are balancing the difference in the length between the linked lists. The shorter one will get over soon and by redirecting to longer list's head, it will traverse the extra nodes also.) Finally they will Meet at the Intersection node.

Q) Given an array of distinct elements. The task is to find triplets in array whose sum is zero.

Examples :

Input : arr[] = {0, -1, 2, -3, 1}

**Output : 0 -1 1
2 -3 1**

Input : arr[] = {1, -2, 1, 0, 5}

Output : 1 -2 1

O(n³):

```
// A simple C++ program to find three elements
// whose sum is equal to zero
#include<bits/stdc++.h>
using namespace std;
```

```
// Prints all triplets in arr[] with 0 sum
```

```
void findTriplets(int arr[], int n)
{
    bool found = true;
    for (int l=0; l<n-2; l++)
    {
        for (int j=l+1; j<n-1; j++)
        {
            for (int k=j+1; k<n; k++)
            {
                if (arr[l]+arr[j]+arr[k] == 0)
                {
                    cout << arr[l] << " "
                        << arr[j] << " "
                        << arr[k] << endl;
                    found = true;
                }
            }
        }
    }
}
```

```
// If no triplet with 0 sum found in array
if (found == false)
    cout << " not exist " << endl;
```

```
}
```

```
// Driver code
```

```
int main()
{
    int arr[] = {0, -1, 2, -3, 1};
    int n = sizeof(arr)/sizeof(arr[0]);
    findTriplets(arr, n);
    return 0;
}
```

Hashing - O(n²):

```
// C++ program to find triplets in a given
// array whose sum is zero
```

#What's Trending

Top 10 Technologies:

- Artificial Intelligence & Deep Learning
- Behavioral Analytics
- Embedded Hardware Authentication
- Blockchain Cybersecurity
- Zero-Trust Model
- Robotic Process Automation
- Intelligent Apps
- DevOps
- Augmented Reality and Virtual Reality
- Angular and React

```
#include<bits/stdc++.h>
using namespace std;
```

```
// function to print triplets with 0 sum
```

```
void findTriplets(int arr[], int n)
{
    bool found = false;

    for (int l=0; l<n-1; l++)
    {
        // Find all pairs with sum
        // equals to
        // "-arr[l]"
        unordered_set<int> s;
        for (int j=l+1; j<n; j++)
        {
            int x = -(arr[l] + arr[j]);
            if (s.find(x) != s.end())
            {
                printf("%d %d %d\n",
x, arr[l], arr[j]);
                found = true;
            }
            else
                s.insert(arr[j]);
        }
    }
}
```

```
if (found == false)
    cout << " No Triplet Found"
<< endl;
```

```
}
```

```
// Driver code
```

```
int main()
{
    int arr[] = {0, -1, 2, -3, 1};
    int n = sizeof(arr)/sizeof(arr[0]);
    findTriplets(arr, n);
    return 0;
}
```

Sorting : O(n²):

```
// C++ program to find triplets in a given
// array whose sum is zero
#include<bits/stdc++.h>
using namespace std;

// function to print triplets with 0 sum
void findTriplets(int arr[], int n)
{
    bool found = false;

    // sort array elements
    sort(arr, arr+n);

    for (int i=0; i<n-1; i++)
    {
        // initialize left and right
        int l = i + 1;
        int r = n - 1;
        int x = arr[i];
        while (l < r)
        {
            if (x + arr[l] + arr[r] == 0)
            {
                // print elements if it's sum is zero
                printf("%d %d %d\n", x, arr[l], arr[r]);
                l++;
                r--;
                found = true;
            }

            // If sum of three elements is less
            // than zero then increment in left
            else if (x + arr[l] + arr[r] < 0)
                l++;

            // if sum is greater than zero than
            // decrement in right side
            else
                r--;
        }
    }

    if (found == false)
        cout << " No Triplet Found" << endl;
}

// Driven source
int main()
{
    int arr[] = {0, -1, 2, -3, 1};
    int n = sizeof(arr)/sizeof(arr[0]);
    findTriplets(arr, n);
    return 0;
}
```

Did you Know ?

HP, Google, Microsoft and Apple have just one thing in common, other than the fact that they are IT companies. They were all started in garages.

Resources to help you out

- General:
- 1. NETTUTS
 - 2. WebAppers
 - 3. IBM’s developerWorks
 - 4. del.icio.us
 - 5. GeeksForGeeks

BLOG RECAP: Articles from our members

Molecular eraser enables better data storage and computers for AI

Mehul Agarwal
Core Committee member

Utilization of hydrogen molecules to seek out and automatically repair errors in atomic-scale circuitry to improve atomic data storage, is one of the most heated topics researchers have been holding an eye on. This new tool better enables an ultra-efficient sort of hybrid computer for the training of neural networks for artificial intelligence where a hydrogen-related novel method takes advantage of a natural physical phenomenon to the atomic-scale manufacturing world, that can reduce carbon-intensive implications. This research study is focused on the latest speeds of processes 1000 times on the atomic-scale manufacturing process. With the application of atomic memory, we will now be able to craft smaller hard drives to more efficient data centers and supporting our data-driven climate-concerned planet.

Researchers in Canada have developed a scanning tunneling microscope (STM) charge characterization technique which decreases the influence of the typically perturbative STM tip field for this purpose. Using the technique, they observed single molecule binding events to atomically defined reactive sites. The technical process of moving hydrogen molecules at the atomic level scales up in efficiency is inclusive of electronic circuits and memories increase in size, translating to easier mass production of low-power electronics with more memory and faster functioning. Wolkow and Achal are two of the minds behind the groups’ recent groundbreaking discoveries, quickly and efficiently improving the work, that once was slow and ineffective.

It’s supposed to be automatic, but actually you have to push the button.



Extent of Machine Learning Algorithms ?

Rajat Sablok

Core Committee member

Even in its infancy, machine learning algorithms have never failed to surprise techies. New algorithms are being written every day to help change our lives for the better. Many believe if we sleep better, we perform better as a whole. Keeping this in mind, researchers have developed a machine learning algorithm that classifies the sleep stages of mice. As strange as it may sound, this research done on mice will have great impact on our lives.

Manual scoring of sleep stages requires considerable human expertise and efforts. This gave rise to automated sleep stage scoring for mice. The existing methods do not provide the scoring accuracy required for practical use. Dubbed 'MC-SleepNet', the algorithm achieves an astounding 96% accuracy. This highly accurate method makes use of two deep neural network. The reason for such high accuracy is that it makes use of a dataset of 4,200 biological signal records of mice. The use of this system for automatically annotating data can significantly assist sleep researchers when analyzing the results of their experiments.

New technology makes internet memes accessible for people with visual impairments.

Anmol Pant

Core Committee member

Memes are graceful intricate entities bestowed upon us, filthy peasants which are sporadically known to drift one into a sea of existential crisis. If you are someone who relates to Patrick when it comes to living under a rock and are somehow unfamiliar with this cross-cultural phenomena, in layman terms, a meme can be best described as the online version of an inside joke, but, if you are a man of culture as well who is well versed with them ,this article is going to be such wow much fun for you.

Unfortunately people with visual impairments often find it difficult to understand and interpret memes as the screen reader technology falls short whilst interpreting memes which don't include alternate text to depict what's portrayed in the image. For instance, the screen reader software might just be able to identify the image of a frog and read the text encapsulating it, without even grasping that it is 'kermit' it is looking at ,let alone the essence of the image.

Most social media platforms allow users to add alternative text to the images but this feature is seldom expected to the fullest, making it increasingly difficult for the visually impaired to be a part of this cross-cultural bandwagon.

The new alt- text generating AI attempts to bridge the gap where screen recorders are found to stumble by breaking down the meme into audio information, the other template uses the alternative text feature describe the image , the third template separates the text and the background image. The new images encountered are then added to the existing catalogue of memes from which the model learns to identify future memes, hence making the AI all the more powerful.

The researchers at ACCESS in Pittsburgh are currently working on other related projects, which include a browser extension for Twitter that attempts to add alternative text for every image a user uploads on the website.

Are Hiring algorithms fair? They are too opaque to tell, study finds.

Shashank

Core Committee member

An old saying goes as - “ Time is Gold ” and so saving time is necessity of the hour . Hiring new employees takes a significant amount of time which can lead to extravagance of time . Hiring decisions taken by humans can be biased and may have discrimination. In order to overcome this problem , hiring algorithms are brought in to the market . Predictive hiring tools to both reduce the time and cost - and to hypothetically increase the quality and tenure - of each new hire. Understanding at which points algorithms come into play in the hiring process can help identify the origins of bias.

Algorithms are often trained to read specific formats of CVs and resumes, which could mean your CV is not evaluated properly. The algorithm successfully converts the CV into machine readable format and rank the application according to its factors such as years of experience ,languages and software skills . Often this approach inherently replicates the same biases that were present before the arrival of AI recruiting tools. If the gender distribution of the training data was strongly imbalanced, this may be replicated by an algorithm even if gender is not included in the information provided in the application documents.

However , the algorithms used by recruiters are not neutral ; rather ,they reproduce the errors produced by humans that they are made to eliminate .

The developers of this tools don't provide a concrete model and documentation that reports for its accountability, fairness and transparency. Thus ,the opaque nature of this algorithms make them a bit difficult to use. Hence, reducing the complexness of the algorithm will increase its viability .

Cornell University's Manish Raghavan said, "The real question is not whether algorithms can be made perfect; instead, the relevant comparison is whether they can improve over alternative methods, or in this case, the human status quo."

