Instructions:

- **Apply HEADING-1 (ctrl + alt + 1) style for new company name to show in outline**
- **Apply HEADING-2 (ctrl + alt + 2) style for your college name**
- While typing, use **Ctrl + Enter** to go to new pages
- **PLEASE KEEP COMPANIES ON SEPARATE PAGES**
- Enable outline for Company Shortcuts **View Show Document Outline**
- Page edit history will be maintained in **History Page**
- If possible, mention whether the company is open for M.Tech. or notF
- While adding external solution links, please apply green color highlights
- Mention **CPI Cutoff and eligible discipline,** please apply red color highlights

Please don’t edit or remove heading 1 or heading 2 style , it screws up the outline and makes the document look chaotic.

You can search the questions of the companies.

KINDLY ENTER COMPANY HERE, IF ANY INFO IS ADDED IN DOC

Microsoft	Reliance Jio (DS)	Axtria	Adobe	Intel Software	oracle
Amazon	Microsoft(data scientist)	JDA Softwares	Apple	Uber	Tower Research Capital
Rivigo (AE)					

History of Companies

Date	Company + College
31/11/2018	IITG (Microsoft SDE/Uber/TRC)
1/12/2018	(IIT KGP) Apple software , Rivigo (IITK)
2/12/2018	Intel IITM, IITM Oracle
3/12/2018	IIITH Microsoft Data-Scientist, Reliance Jio IITM, JDA Softwares IITM
10/12/2018	(IIITH) Amazon
	KINDLY ENTER COMPANY HERE, ONLY IF THE QUES ARE ADDED IN DOC

Microsoft SDE

IITG

https://www.geeksforgeeks.org/microsoft-interview-experience-sde-2018/

1. https://stackoverflow.com/questions/2205540/algorithm-to-transform-one-word-to-another-through-valid-words

IIT ISM DHANBAD

Online coding test:

The questions discussed in the 2018-2019 placements document were asked in the online test.

Group fly round:

i) Given an two arrays, one containing the x coordinates and the other containing the y coordinates, of the points on the Cartesian plane find the maximum number of points lying on the same line.

Solution: https://www.geeksforgeeks.org/count-maximum-points-on-same-line/

ii) Given a continuous stream of input, the input is of the form: (customer_id, timestamp, amount_of_purchase), return the customer_id with the highest amount of purchase till any given point of time. (**The time will be given by the user as a query and it need not be equal to any of the timestamps provided in the above stream of inputs).**

Out of 105 members, who were shortlisted for this round, only 31 made it to the interviews.

Interview (Round 1):

Behavioral questions:

i) Tell me about yourself.
ii) What do you know about ML?
iii) Why did you take up Computer Science?

Technical questions:

i) Find the first k numbers that have only 3,5,7 as their prime factors.
Similar to this post from geeks.
ii) Design a data structure for Online Book Management System. Also write functions to register a new member, extend his/her membership, to search books from the database.

Interview (Round 2):

i) Discussion over my academic project.
ii) Write a O(n) solution for finding the longest palindromic substring.
iii) Questions on OOPS mainly on **virtual functions, abstract functions**, different types of polymorphism.

Interview (Final Round):

i) This was HR round.
ii) Basic behavioral questions like “Introduce yourself”.

Each interview lasted for 30 minutes on average. It solely depends on the Interviewer. **If you have Machine learning projects then do prepare them thoroughly as they dive deep into the concepts.**

1. For the group fly round, try to write the code for both the questions. The code must be clean and readable. Use proper indentations and deal with the edge cases separately.
2. Dry run the code by taking a small test case.
3. Do not reveal the most optimised solution to interviewer in the first attempt. Build your solution from brute force to the the most optimised approach.
4. If you get stuck at any point, interact with the interviewer. They are very helpful and will be more than happy to interact with you.

Microsoft Data Scientist

IIIT H

Round 0(Group Fly):

1) Given an array A, all numbers appear K times but a number appear K+1 times. Find the number appearing K+1 times. Expected Time: O(n*31)
2) Given a doubly linked list and head and tail pointers. Each node contains an integer value. Find if the list is a palindrome. Eg (1)->(23)->(1)->(321) => Yes, (1)->(-23)->(3)->(2)->(-1) => Yes. Expected Time. O(n);

Round 1

1) Given Wikipedia Dump design classifier to form a taxonomy. Multiple parts posed in the question to simplify. What features are unique in a wiki page. How to incorporate this into the model. What should the model be? How to incorporate info-box information. Can we use graph/s based inference How? Write the code for a single wiki page prediction.

Amazon

IITD

1. Serialize and deserialize n-ary tree without using any extra space
2. Find the largest BST in any given binary tree
3. In a binary search tree, add the value of all the nodes greater than the present node to the value of present node
4. Print all nodes at a distance of k from the present node in the binary tree
5. Find nth node from last in linked list without extra space
6. Find the missing number in an array where every element is repeated twice except one.
7. Create a stack such that is a element ‘x’ present in the stack and again u want to push ‘x’ then u first remove old ‘x’ and insert new ‘x’ and this task should happen in O(1).
8.

IIIT H

Round 1

1) Give a binary Tree determine if its a binary search tree. https://www.geeksforgeeks.org/a-program-to-check-if-a-binary-tree-is-bst-or-not/
2) Given a dictionary of words. A word is connected to another word if the edit distance is 1. Now given a starting and ending word, find minimum number of steps to reach ending word by using the connections in the dictionary. Solution: BFS. https://www.geeksforgeeks.org/word-ladder-length-of-shortest-chain-to-reach-a-target-word/

Round 2

1) Given a binary tree find the sum of all internal nodes whose values are odd. Complexity added in the definition of the internal nodes. Basically reduced to doing a level order traversal of binary tree.
2) Given a BST, Delete a node such that the BST property holds (not height balanced).https://www.geeksforgeeks.org/binary-search-tree-set-2-delete/
3) Have you attempted/done open source projects? What are your major learnings?
4) Describe one of your projects where the course content and internet/wikipedia did not help significantly and you had to use common sense or unconventional things/ideas to solve the issue.

Round 3

1) Given a cost array and a procurement array. Find the minimum segment where sum of cost array equals sum of procurement array, which is greater than ‘K’ days. If any such segment is found return the starting and ending index of any such segment. Expected Sol: Time Complexity: O(nk), Space Complexity: O(n). Sol using Prefix Sum and a

hashmap of integers and list/deque. Using an efficient data structure and binary search Time complexity could be reduced to O(nlog(k)).

2) Asked question from Machine Learning Project based on Resume.

Round 4

1) Given an array of positive and negative numbers, partition them such that left part has positive numbers and right part has negative numbers. Relative ordering in positive and negative numbers should not change. Do this in place. Expected Sol : Modified Merge Sort. Example: 1, 2, 5, -3, -5, 4 ===> 1, 2, 5, 4, -3, -5
2) Question from Operating Systems: What is Virtual Memory, Virtual Address to Physical Address, Page Tables. Locks, Semaphores. Show how to use on a particular scenario.

Each interviewer explained about their specific work/roles at Amazon and offered to answer questions. It was expected to come up with relevant questions based on their work at Amazon. The first interview was 90 mins, second 60 mins, third 60 mins and fourth 90 mins.

https://www.geeksforgeeks.org/word-ladder-length-of-shortest-chain-to-reach-a-target-word/

Reliance Jio(DS)

IIT KGP

1. Asked to write a program to find if the number is prime(lot of followups eg: how can you decrease the number of calculations performed? Why will iterate only till square root of n etc.)
2. Given a sentence and asked to print the sentence in the reverse order.
3. N battalions went to a party, no lower rank officer of the same battation can sit along with senior. minimum tables required?
4. N wine bottles 1 contains poison, minimum required to find the poison.
5. prisoners

IIT Bombay

1. Program to find a number is prime or not
    a. Given any natural number, find the next prime number (you are free to pre-compute)
    b. With Time complexity of the above is O(1)
2. Given N-1 numbers from 1-N numbers and one number missing find the number missing
3. ML questions on word-embeddings

4. How to choose training set and testing set.

5. Questions on Loss functions calculation.

Reliance Jio (SDE)

IITM

Interviewers were not helping interviewee. Interviewers attitude was rude.
Round 1:

1. Questions on data structures and heap
2. The puzzle on how to implement Sudoku game with given space complexity

Walked out after the 1st round because of the demotivating attitude of the interviewer.

Axtria

IIT KGP

1. Mostly the interviewer tried to grill me. Asked what will cgpa signify? Why was it low?
2. Typical HR questions.

I

J.P Morgan (DS)

IITG

1. https://www.geeksforgeeks.org/puzzle-16-100-doors/
2. https://leetcode.com/problems/trapping-rain-water/

Goldman Sachs

IITG

1. LCA of Binary Tree (O(n) solution)
2. Find next greater element in an array.
3. Find arbitrage opportunity in a graph (Given a starting currency and their conversion rates) .

IIT Kharagpur

1. Find loop in linked list-say both the methods and compare
2. Initial start position given. Find shortest path covering all cities. (solved using Dijkstra algo)
3. Graph bfs application
4. Tries-code for insert and search

Adobe

IIT KGP

1. B-Trees (walk through an example)
2. Reverse sentence word by word O(n)
3. Next greater permutation of string
4. Neural Network (Backpropagation derivation)
5. Geometric distribution puzzle
6. Thrashing in OS and page replacement algorithms

Quantiphi

IIT R

1. What is difference between a graph and a session regarding tensorflow? Why we need graph? (Tensorflow was in my resume)

2. What ML algorithms you have worked on?

3. How decision tree makes criteria for decision to divide data into groups?

4. How does xgboost works?

5. Do you know about gini coefficient? its formula as well.

6. Do you know about multicollinearity? (couldn't ans this one so he quickly moved on)

7. How support vector machine works?

8. Since you have mentioned monte carlo simulation, how would you find area under un integratable function using monte carlo simulation?

9. How can you populate a circle with dots uniformly? every point has to be equally likely.

10. What matrix we use for classification error?

one or two more questions I don't remember.

11. Do you have any questions?

ORACLE

IIT-M

1. Angle between minute and hour hand.
2. Data structure used for family tree.
3. Approaches you will use to store graph and why.
4. https://www.geeksforgeeks.org/search-a-word-in-a-2d-grid-of-characters/ (Guy asked for different variation of this code like what if u have to maximize word count , what will be your parallazation scheme.)
5. Write c++ code for **grep** linux command.
6. Find all lines in a document which contain a given word.
7. Code for LRU cache (approach matters)

IIT KGP

Soc. Gen.

JDA Software

IITM

Profile: Software Engineer
Package: 20L
Open for: CSE (BT, DD, MT, MS)
Number of Rounds: 3

Round 1:

1. Discussion on projects
2. https://www.geeksforgeeks.org/write-a-c-program-to-find-the-maximum-depth-or-height-of-a-tree/
3. Few basic questions on cloud computing (will be based on the courses you have done)

Round 2:

1. Discussion on projects
2. A puzzle based on the combination

Round 3 (HR):

1. Basic situation based questions like
2. If you are depressed what will you do?
3. If your team member is not working, then what will be your move?
4. Have you ever regretted doing anything in life?
5. Package discussion.

Tips:

1. Be thorough with all the projects you have mentioned in your resume.
2. Prepare yourself for the basic questions of the courses you have done/mentioned in the resume.
3. Don't hesitate to ask for a hint if you're stuck somewhere.
4. CONFIDENCE matters.
5. Never give up on any problem and try to solve it even if you don't know.

Intel (SE)

IITM

Package: 19L
Open for: CSE (BT, DD, MT, MS)
Number of Rounds: 2 for some people and 3 for some people.

Some people had 2 rounds of technical and HR round as 3rd round. Some people were directly sent to the HR round after the 1st technical round (reason: I don't know).

Round 1:

1. Algorithm to find a given word in all the files and subfolders
2. Basic questions related to OS and Data Structure
3. Questions on IPC
4. Brief discussion on the projects.

Round 2: (HR for me)

1. Happiest moment of the life
2. How you handle team members if you're working in a team

Hints: Don't say "I don't know" to any questions, be confident while talking, if your solution was proved to be wrong, accept it.

Apple (Software)

IIT Kharagpur

1. About almost every project and internship written in resume
2. Compare apple maps and Google maps. Dijkstra algo application and linear Regression to find weights of each edge in the graph.

IIT BHU

1.Detailed discussion on Minimum spanning tree and graph algorithms.
2.Research problems on networking were discussed but major focus was on graph solution.

IIT Bombay

Tips :

1. **Don't just jump into the solution. They judge your thought process. Start with the simplest solution and build up on that, optimize that.**
2. **Know your resume. They asked a lot of questions about projects and internships that I mentioned in my resume. Make sure that you are able to describe whatever you have written on your resume.**
3. **Think out loud. Make sure you handle all corner cases while answering coding questions.**

There were a total of three rounds. Each round was of 50 minutes. First, there was a coding round, followed by system design round and finally a HR round.

Each round started with interviewer giving his/her introduction and what he/she is working on followed by detailed technical or HR interview and then 5-10 minutes for questions from the interviewee.

Round 1 :

1. Josephus problem
    a. Interviewer wanted analytical solution.
2. A simple problem based on DFS.
    a. Interviewer wanted proper code with all corner cases with proper function names etc.
3. Finally, there was a discussion on various projects and internships that I mentioned in my resume.

Round 2 :

1. Design a game leaderboard displaying top rankers from different regions.
    a. Take reliability, availability and latency into account for system design questions.
    b. Discussion on choice of databases : SQL based vs NoSQL.
    c. Discussion on latency, availability and reliability (CAP theorem).
    d. Database design for the system.
    e. API design.
2. What happens when you type an address on a web browser and hit enter. Followed by questions related to DNS like what it is and how it works etc. This was followed by a question about how would I design DNS.
3. This was followed by discussion on projects that I mentioned in my resume.

Round 3 :

1. Discussion on various projects and internships that I mentioned in my resume.
2. Discussion on scalability of work done during my internship.
3. Discussion on some of the open source development I have been involved in.
4. General HR questions.
5. Discussion on work culture in Apple.

Uber

IITG (Domestic + US)

Tips :-

1. **Be ready to type and run the code on hackerrank code pair.**
2. **Each round is a knockout round, try not to mess up any round.**
3. **The interviewer will time you and look at your coding style.**
4. **Try to code the best in your first attempt as quickly as possible.**
5. **Make sure all the base/corner conditions are checked.**

Round 1 :

1. Maximimise the minimum distance type problem - https://www.spoj.com/problems/AGGRCOW/ a
   Solution - **Binary Search**.(Read the tutorial of the above problem)
2. You are given n offices of Uber and an array containing the maximum number of holidays you can take during each week of the year at every office. You are also given a directed graph between the offices. Your objective is to maximise the number of holidays you can take in the year. You can switch from one office to other on weekends if there is a directed edge between them.
   Solution - simple DP. *dp[i][j]* = the maximum number of holidays I can take starting at office *i* and *j*th week.
   dp[i][j] = holidays[i][j] + max{dp[i][j+1], all the connected offices}.

Round 2 :

Given an array ***A***, maximise ***A[i] - A[j] + A[k]*** under the following constraints

1. ***i < j < k***
2. ***A[i] < A[j] < A[k]***

   Solution - O(n log n)
   Pre-calculate the Maximum element to the right of each element.
   Loop once through the array. The current iter represent the A[j]. Maintain a Binary Search Tree for the elements to the left of this element. Insert this element and find the predecessor of the current element in the tree.
   Update the value of the answer for the required conditions.

Round 3: Hiring Manager

System Design question. Don't remember the question, but was very tough and I got to know later than no one was able to solve this.

Tower Research Capital

IITG

Round 1 :

1. What is ARP?
2. What is DHCP?
3. Given 2 type of coding styles, weigh out their pros and cons for different type of code segments (A,B,C).
    a. Code style 1

```
For i in N:
    A
    B
    C
```

    b. Code style 2

```
For i in N:
    A
For i in N:
    B
For i in N:
    C
```

4. You are standing in the center of the circle at coordinate 0,0. You are given the coordinates of the trees in the 2-D plane planted outside the circle.You are also given the angle of your camera capture window. Find the angle at which you can capture the maximum number of trees. The angles are not quantised.
    a. No tree will overlap the other tree.
    b. you are given angles instead of the coordinates
    c. The angles are given in sorted order.

Round 2 :

Don't remember the exact question, but it was a simple DP question and a very basic System Design questions. The answer to the system design question was to use Load balancer.

Round 3 : HR round

Just asked my Company Preference and Why I want to join TRC given that there are other companies like Graviton, Uber USA, Google in competition. Need a very strong reason to make the HR believe your preference :p

Yahoo Japan

IITB

2 Rounds which covered the following content

- Coding on paper,question - https://www.techiedelight.com/find-pair-with-given-sum-array/
- Questions related content that was mentioned on resume
- Some questions on willingness to work in Japan

Rivigo Services (Algorithm Engineer)

36 Lacs

IIT KANPUR

1) Given a and b, in range (0, 10^18), find number of elements in group with maximum cardinality. Where each group has all those numbers from a to b which has its one digit number equal to the group number.

   One digit number of any number n:::: one(n)

   One(n){ s = sum of all digits of n
   return (s) }
   And if n is single digit number return n.

   Eg: a= 9 and b=11
   9 10 11 = 9 1 2
   3 groups, with each having 1 element in it. So, ans is 1.
   (Hint:: there will always be 9 groups with cardinality ≥ 0)