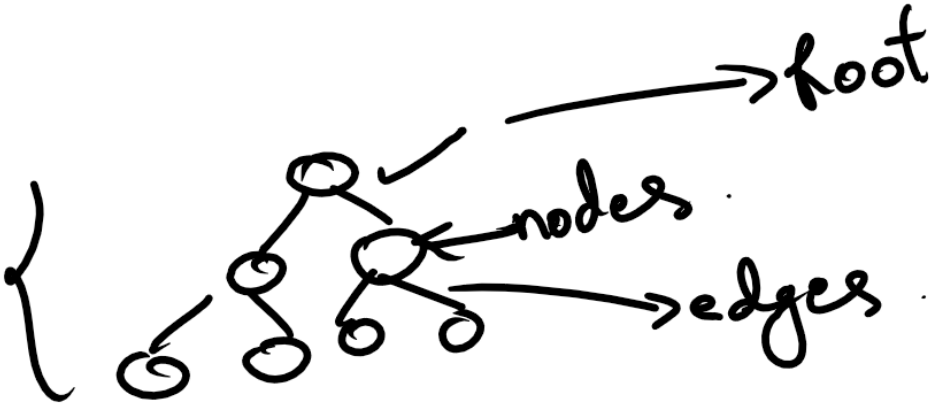
BOSSCODER ACADEMY

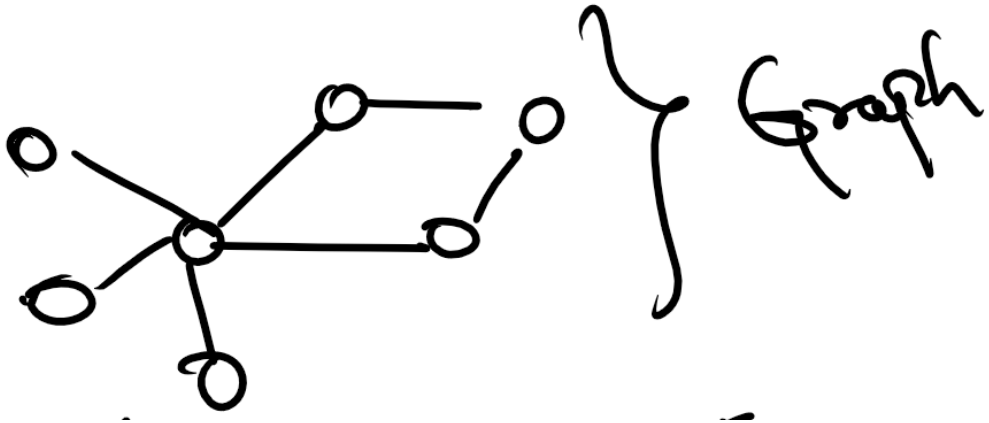
MASTERCLASS NOTES

Starts @ 0905 PM

- → Intro ✓
- → Graphs — Def
  - → Repr
  - → DFS vs BFS
  - → Pitch
  - → Problems
  - → 10 mins
- → Q&A

Trees





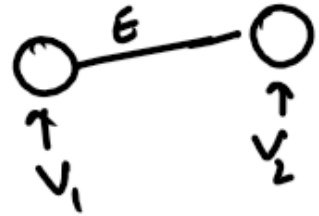
Graph is tuple → mathamatical obj

INT
Strin
Obj

$G \rightarrow (V, E)$

V → set of Vertices Nodes

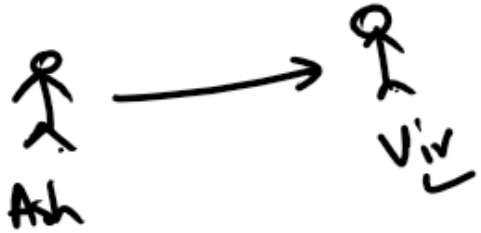
E → set of edges.



Social N/W

facebook

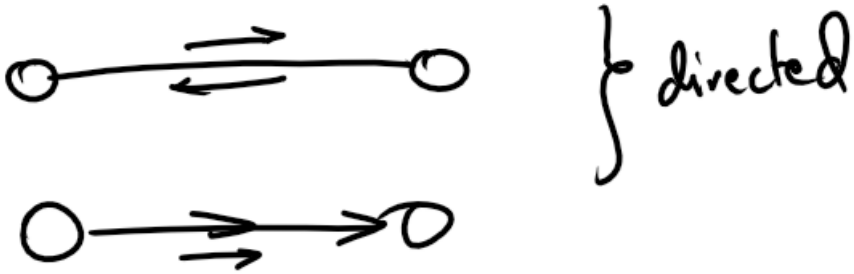
Insta



Undirected graph.

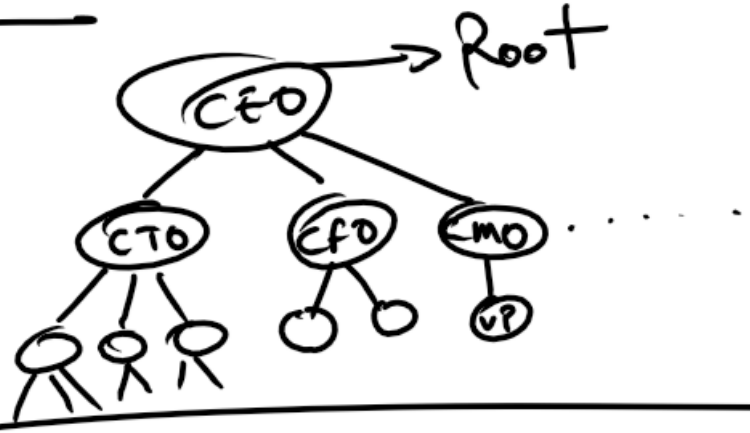
Directed Graph

Google map

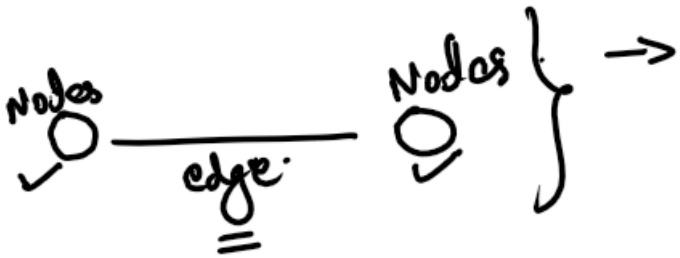


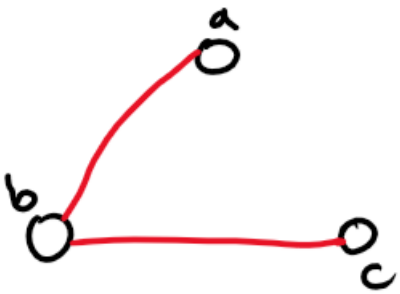
Company structure:

Tree



Representation of Graph





① matrix

$$\begin{array}{c|ccc} & a & b & c \\ \hline a & 0 & 1 & 0 \\ b & 1 & 0 & 1 \\ c & 0 & 1 & 0 \end{array}$$

} Undirected Graph.

Just by given matrix, how do we identify it's an undirected graph?

int[ ][ ] matrix } code.

② Adj list "c"

a → b
b → a → c
c → b

} Linkedlist

C# JAVA } Array list list of list.

List<List<int>> graph } code.

{ a → {b}
b → {a, c}
c → {b} }

which is Better ?

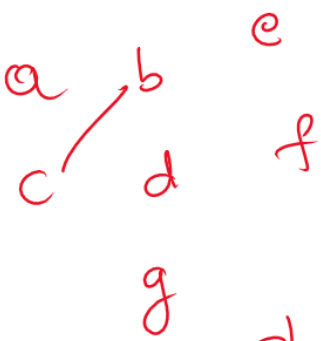
number of nodes in list = a, b, c

ArrayList<int> arrlist

ArrayList<ArrayList<int>> Graph } Java|C#

Vector — C++

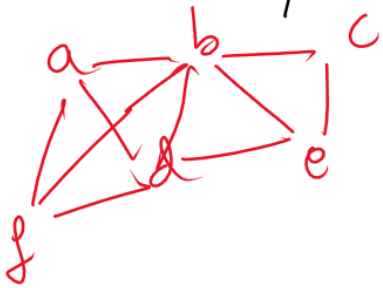
	a	b	c	d	e
a	0	0	0	0	0
b	0	0	1	0	0
c	0	1	0	0	0
d	0	0	0	0	0
e	0	0	0	0	0



Sparse graph → has more less edges
→ lot of 0s

Adj list
↳
a — null
b — {c}
c — {b}
d — null
e — null

Adj list → ~~more space~~
↳ Pointer overhead

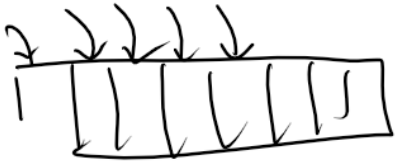


Dense Graph → Matrix.
↳ why not list for dense graph?

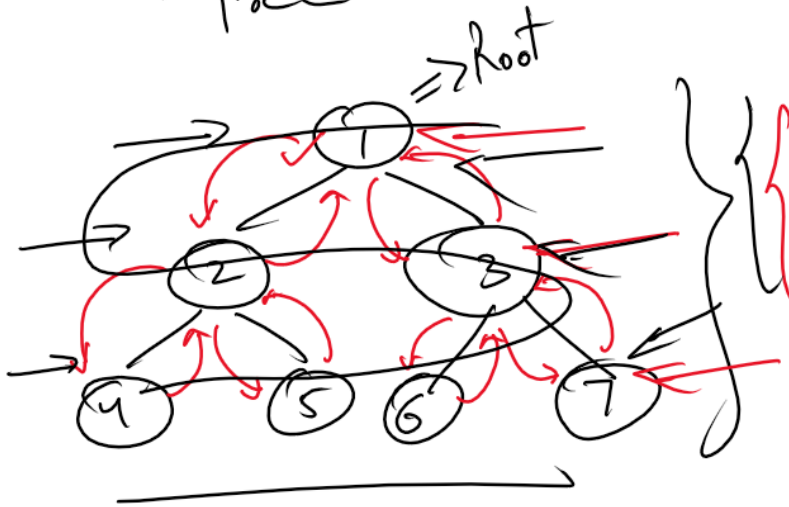
int[ ][ ] matr = new matr[8][8] ⟶ Array → Contiguous mem Allocation

Vs

List<List<in>> matr = new Li..... ⟶ Linked list → heap



Tree



In Order
Pre Order
Post Order
} → DFS

1, 2, 4, 5, 3, 6, 7

Level Order → 1; 2, 3, 4, 5, 6, 7 } BFS

1 2 3 level

Level → 1, 3, 2, 7, 6, ... } BFS

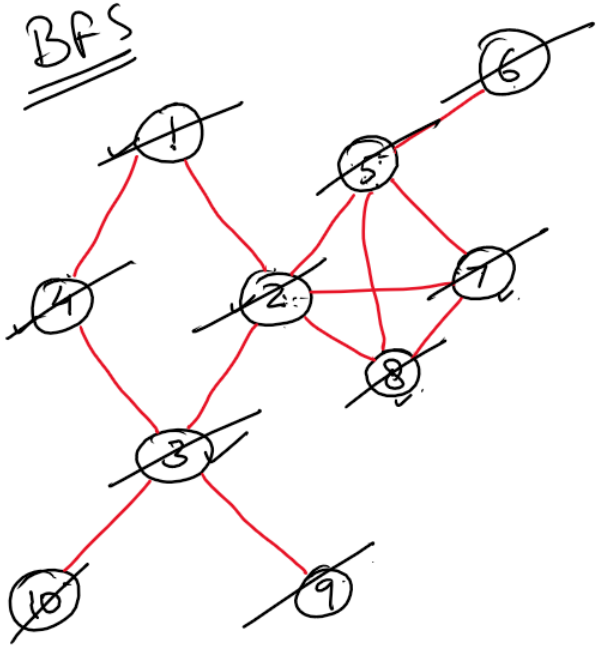
1 2 3

multiple output for DFS or BFS

In Pr Po

{RL, LR, spiral}

BFS

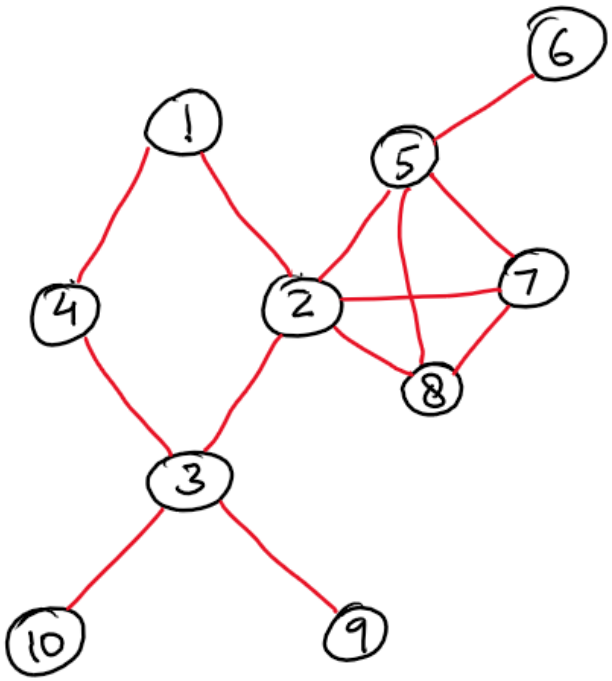


→ can start from anywhere.

→ Queues helps us to traverse

1	4	2	3	5	7	8	10	9	6

⇒ 1, 4, 2, 3, 5, 7, 8, 10, 9, 6



Depth first Search

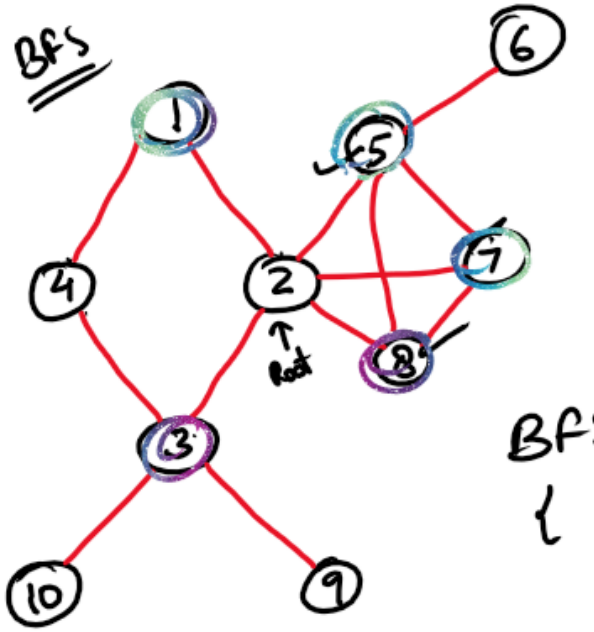
Vs

Breadth first Search

Traversal Algorithm

1. Visiting a Vertex
2. Exploration of Vertex

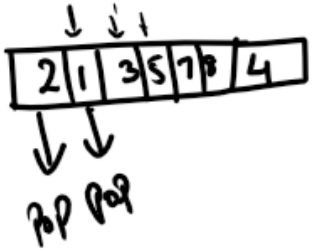
BFS



1, 4, 2, 3, 5, 7, 8

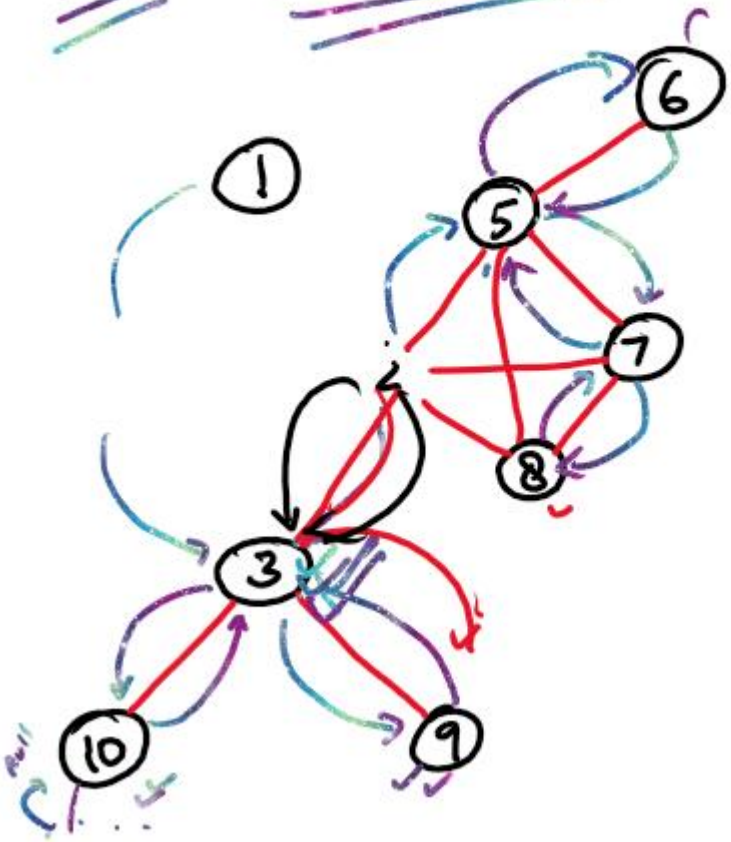
1, 2, 4, 5 7 8 3

```
BFS(root)
{
    create queue;
    create list of visited nodes.
    mark root node as visited
    enqueue root node
    while (queue is not empty){
        x = queue.Pop()
        for (all immediate neighbours of x){
            if (not visited)
            {
                enqueue
                mark as visited
            }
        }
    }
}
```



DFS

List visited



```
f1(root)
{
  for(A=0)
    f1(2)
}
```

reverse this loo

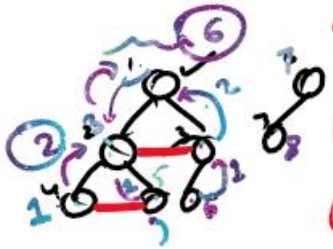
10, 9, 3, 4, 8, 7, 6, 5 ..... DFS

① Given a graph

↳ matrix
↳ Adj list } or { if graph is a forest }

input → forest.

```
int intution(root)
{
    if(root==null)
        return 0;
    count = 0;
    for all children child i {
        count = count + intution(child)
    }
    count ++;
    return Count;
}
```



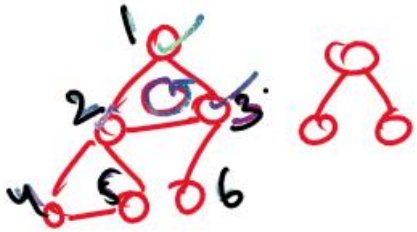
tree input

	1	2	3	4	..	7
1	0	1	1	0		0
2	1	0	1		0	1
3	1	0	1	0	0	1
4	0	0	0	1		0
7						

$O(n^2)$

total no. of nodes

↳ no of rows in matrix



1 - 2, 3

2 → 4 5 3

1 2

4, 5, 3

1 2 6

loop

loop

Break the loop

Hashmap visited

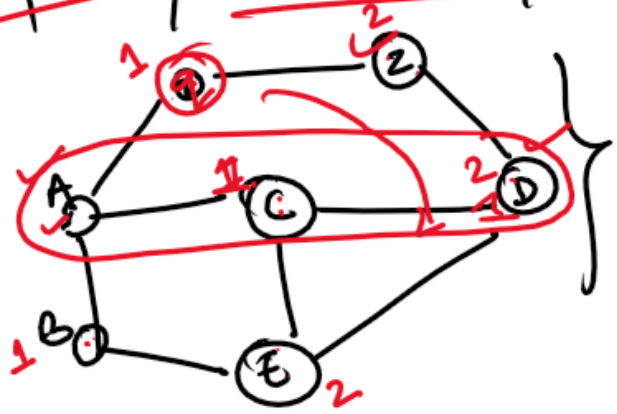
visted <+v

```
int dfs(root, vi) {
    if(root == null) return 1;
    visited [root] = true
    for(neighbours of root → neighbour[i]) {
        if([root.neighbour[i]] visited != true)
            { count = count + dfs(neighbour[i])
            }
    count++
    return count;
}
```

DFS - Problem above.

BFS → Problem.

Shortest Path / minimum no. of hops . . . . . BFS



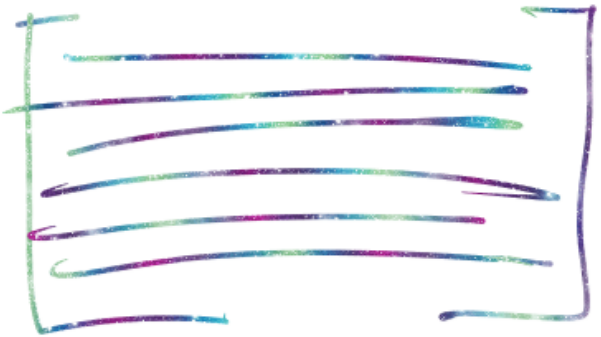
A to D

A Q Z D
0 1 2
A C D
A B E D
A B E C D

lot of Paths.

A	Q	C	~~B~~	~~Z~~	~~D~~	~~E~~

Ans = 2



Gr

{n×n}

{row == col}

m×n ✗

m×m ✓

ABOUT BOSSCODER

Bosscoder is an online upskilling platform for techies. We help learners upskill in tech roles to get them placed at top tech companies.
We do so through our structured & mentored program designed by industry experts.

USP of our program include:

✨ STRUCTURED CURRICULUM:

Covers everything you need to get placed at top tech companies: Problem solving in DS & Algo, CS Fundamentals, System Design (HLD + LLD), Full Stacks & Queues Projects

✨ LIVE CLASSES:

An active learning classroom program taught by engineers working at companies like Microsoft, PayPal, Amazon

✨ 1:1 MENTORSHIP & MOCK INTERVIEWS:

Personal mentors from top tech companies help you provide the right guidance, feedback, and support.

✨ 24/7 DOUBT SUPPORT:

Through our army of Teaching Assistants

✨ INDUSTRY-RELEVANT PROJECTS:

Full Stacks & Queues specialization with Industry-relevant projects

✨ PLACEMENT SUPPORT:

Providing opportunities to tech engineers in eminent startups & top tech companies.

BUILD YOUR CAREER WITH US

- 400+ Alumni placed at Top Product-based companies.
- Highest package of 86 LPA
- Average package of 22 LPA.
- Resume reviewed and interview scheduled for 1000+ students

Lakshmi susmitha
Software Engineer II, JP Morgan

Service Based to JP Morgan in 4 months

From a tier-3 college to working in service-based companies, my thirst to join a product-based company didn't go away. Bosscoder helped me provide a very detailed path from coding to system design. The way of teaching, and 1:1 mentorship helped me a lot.

Before
IBM
Application Engineer

→

After
JP Morgan
Software Egineer II

Dheeraj Barik
Software Engineer 2, Amazon

System Engineer at Service Based to SDE 2 at Amazon

Working in Infosys, I was looking for a platform to prepare for interviews of product-based companies. I found Bosscoder has a highly structured program covering DSA, System Design etc. in detail. Top-quality instructors and mock interviews proved helpful for me.

Before
Infosys
Systems Engineer

→

After
Amazon
SDE 2

Vishal Srivastava
Software Developer, Barclays

Service Based to London Based Bank

Doing self-prep, I couldn't even pass online assessments of Top companies. But the change Bosscoder Academy brought into my preparation is phenomenal. Crucial topics taught in Live classes like DSA, HLD, and LLD, and my personal mentor's guidance ensured I clear my dream company.

Before
Cognizant
Programmer Analyst Trainee

→

After
Barclays
Software Developer

Ujesh Nada
Software Development Engineer, Google

Business Development Associate to SDE at Google

I self-prepared DSA for 8 months, without any results. I joined Bosscoder Academy since I wanted to be mentored by industry experts, and it proved to be a great decision for my DSA and System Design preparation. Their 1-on-1 mentor sessions and Live classes helped me transform my career.

Before
Byju's
BDA

→

After
Google
SDE

Rakesh Kumar Satapathy
Sr. Developer, Hashedin

Bsc. Graduate stuck in service based to Hashedin

Stuck in a service-based company with no exposure, I always believed that I can realize my dream life, but didn't know how. Bosscoder Academy showed the right path to coding geek inside me. Their world-class curriculum and personal mentorship enabled me to switch to my dream role.

Before
Wipro
Software Engineer

→

After
Hashedin
Senior Python Developer

Harshith Ravinoothala
R&D Engineer 1, Synopsys

Tier 3 College Student to Product Based Company

I always wanted to get into a product based company, but being a tier 3 college student lacked exposure to coding. Bosscoder Academy helped me gain confidence in DSA and core subjects like OS, DBMS and System Design. Instant Mentor support helped me stay clear of doubts.

Before
G Pulla Reddy Engineering College
Sudent

→

After
Synopsys
R&D Engineer

Sarveshwar Neogi
Consultant, Sprinkler

Clueless college student to Consultant at Sprinkler

I was wasting my time in college, with no idea how to improve my coding skills. The structured roadmap provided by Bosscoder transformed me into a Tech Rockstar. In-depth live lectures and daily handpicked questions helped me become consistent in problem-solving.

Before
KIIT
B.Tech in CS

→

After
Sprinkler
Consultant

Aarushi Jain
Software Development Engineer, Atlassian

No interest in coding to SDE at Atlassian

My journey in college was a roller coaster ride, and I wasted lots of time in learning from free resources. Bossocder Academy's excellent curriculum helped me become consistent and invest my efforts in right direction. With my mentor's guidance, I received offers from Amazon and Atlassian.

Before
NIT Delhi
B.Tech in EEE

→

After
Atlassian
SDE

Sumedha Khandelwal
Technical Lead at Jubilant Foodworks

Scared of Technical Interviews to Technical Lead

Having 7 years of experience, I always believed there is more to achieve in my career but failed in technical interviews. Bosscoder helped me gain confidence to face technical interviews and I received many offers. Mock interviews and mentor feedback helped a lot.

Before
IHS Markit
Software Engineer

→

After
Jubilant Foodworks
Technical Lead

Irshad K
Software Engineer, ByteDance

NIT Delhi to SDE in Singapore

I am among those talented students who require proper guidance to prosper. Cracking ByteDance was possible due to the guidance of my personal mentor at Bosscoder Academy. Their structured curriculum helped me gain confidence in DSA and System Design.

Before
NIT Delhi
Application Engineer

→

After
ByteDance
SDE

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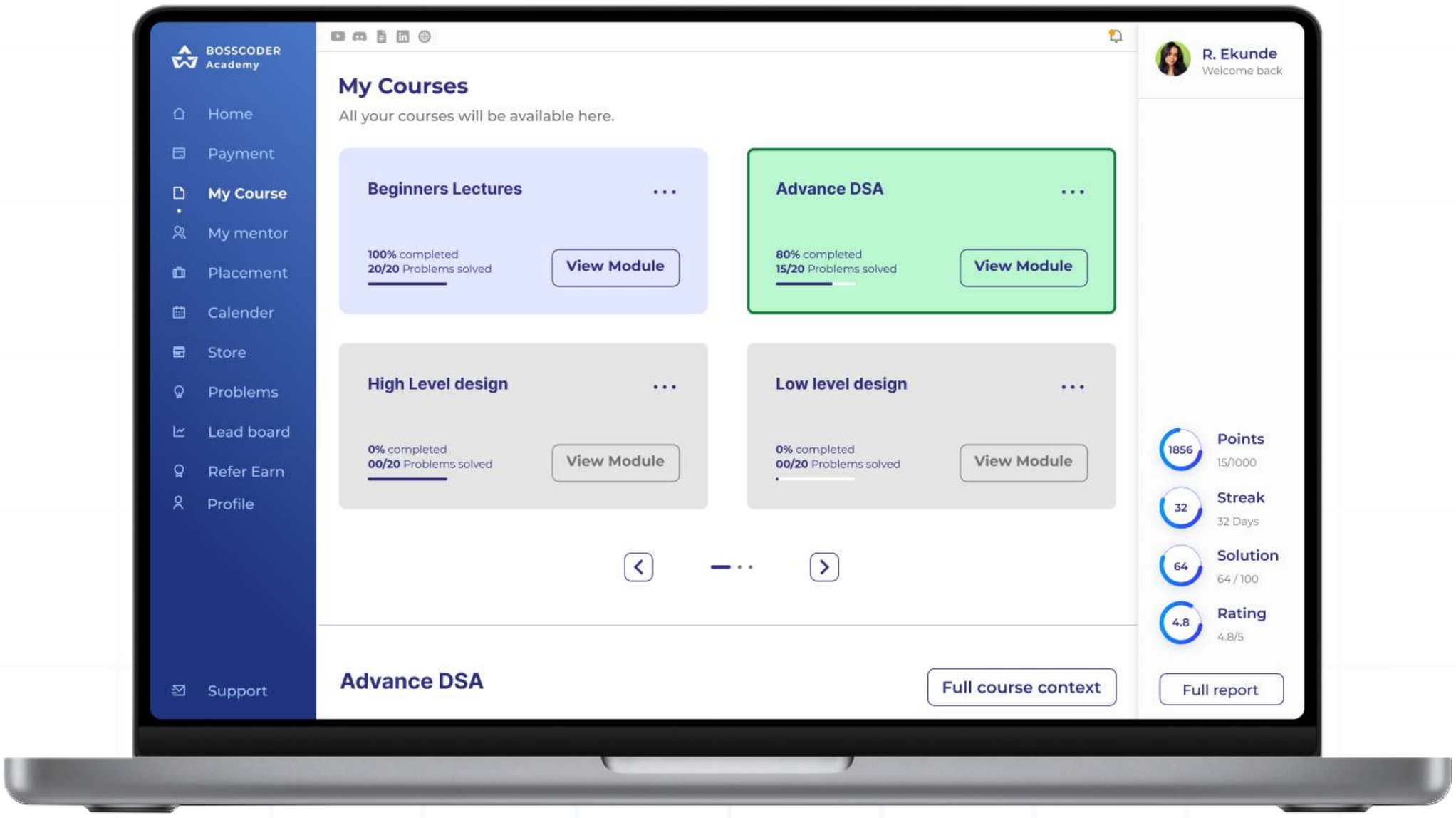
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