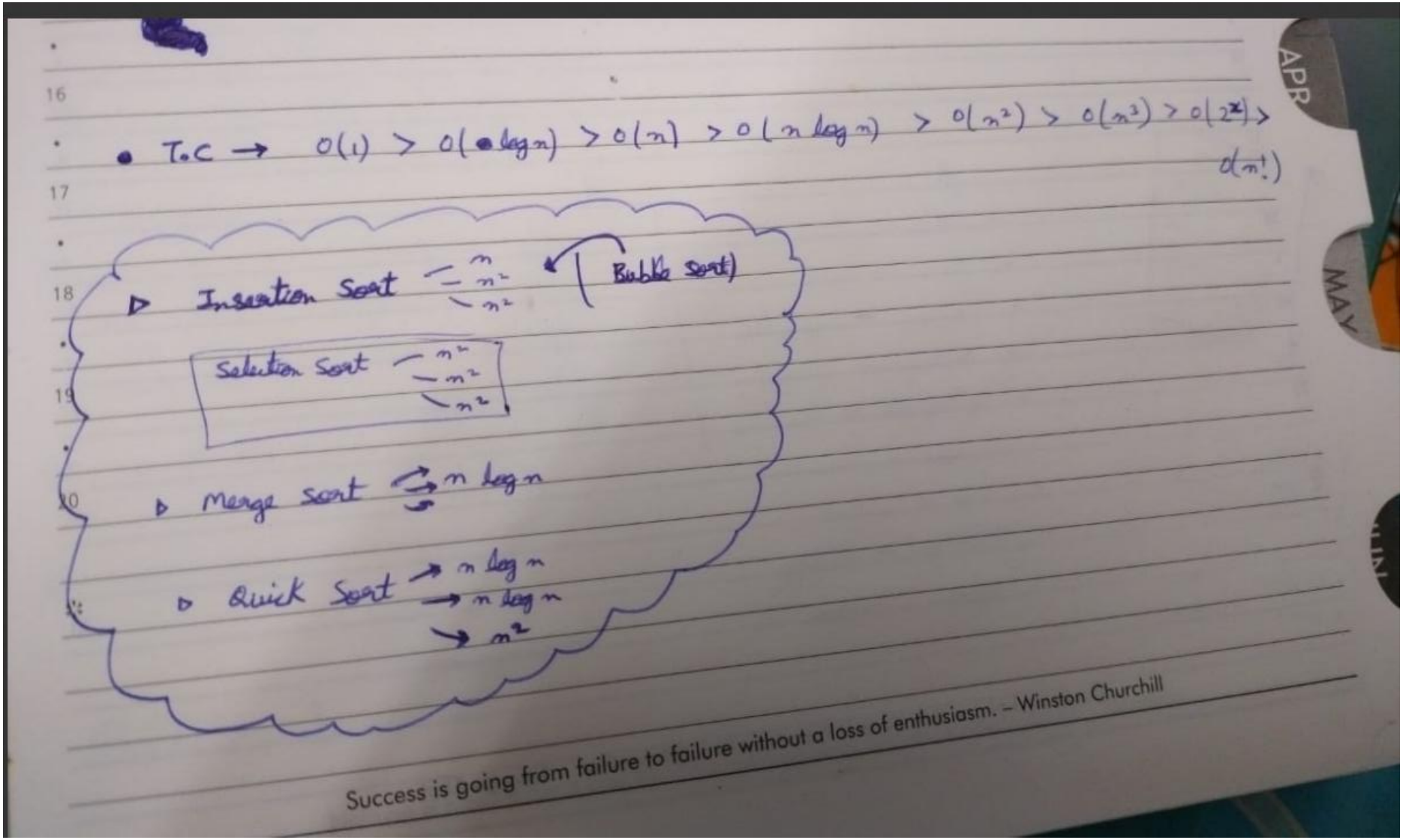
EXTRA:-

1. **400 - Bad Request**: Occurs when the server cannot understand the request due to invalid syntax.
2. **401 - Unauthorized**: Indicates authentication failure; the client needs valid credentials.
3. **403 - Forbidden**: The server understands the request but refuses to authorize it.
4. **404 - Not Found**: The server can't find the requested resource (common for broken links).
5. **405 - Method Not Allowed**: The HTTP method used is not allowed for the requested resource (e.g., using GET where POST is required).
6. **408 - Request Timeout**: The client took too long to send the request, and the server gave up waiting.
7. **409 - Conflict**: The request could not be completed due to a conflict with the current state of the resource (often occurs with PUT requests).
8. **415 - Unsupported Media Type**: The server refuses the request because the media type is not supported.
9. **500 - Internal Server Error**: A general server-side error when something unexpected happens.
10. **502 - Bad Gateway**: The server received an invalid response from an upstream server while acting as a gateway or proxy.
11. **503 - Service Unavailable**: The server is temporarily unable to handle the request (e.g., maintenance or overload).
12. **504 - Gateway Timeout**: The server, acting as a gateway, didn't get a response in time from an upstream server.


• T.C → O(1) > O(log n) > O(n) > O(n log n) > O(n²) > O(n³) > O(2ⁿ) > O(n!)
▷ Insertion Sort — n, n², n²
(Bubble Sort)
Selection Sort — n², n², n²
▷ Merge sort ⇉ n log n
▷ Quick Sort → n log n, → n log n, → n²
Success is going from failure to failure without a loss of enthusiasm. – Winston Churchill

ROW_NUMBER(): Each row ko unique number assign karta hai.

sql Copy code

```sql
SELECT name, salary, ROW_NUMBER() OVER (ORDER BY salary DESC) as rank FROM employees;
```

RANK(): Similar values ko same rank assign karta hai.

sql Copy code

```sql
SELECT name, salary, RANK() OVER (ORDER BY salary DESC) as rank FROM employees;
```

DENSE_RANK(): Similar to RANK but without gaps in ranks.

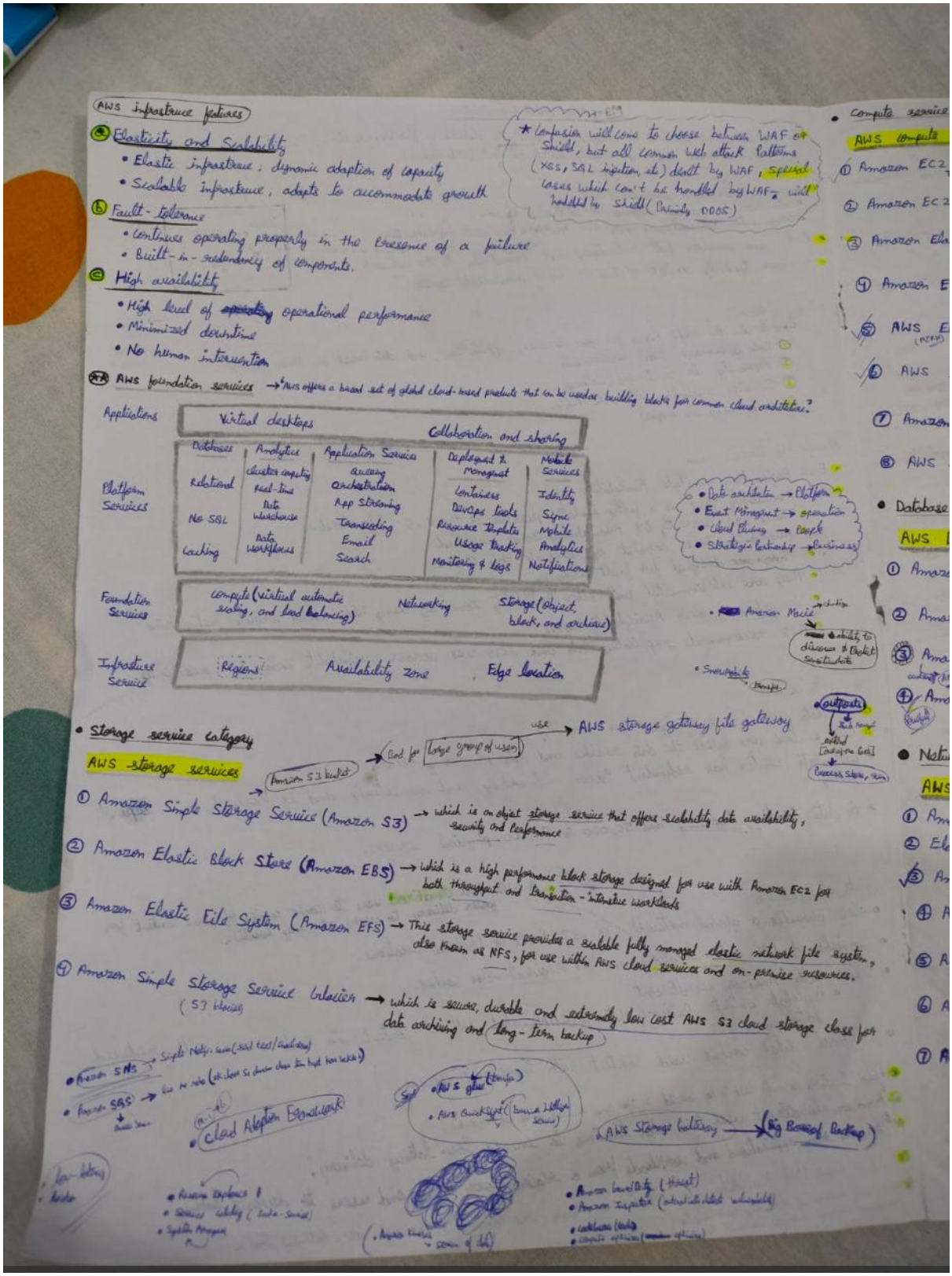
sql Copy code

```sql
SELECT name, salary, DENSE_RANK() OVER (ORDER BY salary DESC) as rank FROM employees;
```

OVER() with PARTITION BY: Window function ko partitions me divide karta hai.

sql Copy code

```sql
SELECT name, department, salary, RANK() OVER (PARTITION BY department ORDER BY salary DESC
```


AWS infrastructure features
a Elasticity and Scalability
• Elastic infrastructure : dynamic adaption of capacity
• Scalable infrastructure, adapts to accommodate growth
b Fault-tolerance
• Continues operating properly in the presence of a failure
• Built-in-redundancy of components.
c High availability
• High level of operational performance
• Minimized downtime
• No human intervention
AWS foundation services → "AWS offers a broad set of global cloud-based products that can be used as building blocks for common cloud architectures."
Applications
Virtual desktops
Collaboration and sharing
Platform Services
Database
Relational
No SQL
caching
Analytics
cluster computing
Real-time
Data Warehouse
Data Workflows
Application Service
queuing
Orchestration
App streaming
Transcoding
Email
Search
Deployment & Managment
Containers
DevOps tools
Resource templates
Usage tracking
Monitoring & logs
Mobile Services
Identity
Sync
Mobile
Analytics
Notifications
Foundation Services
compute (virtual automatic scaling, and load balancing)
Networking
Storage (object, block, and archive)
Infrastructure Service
Regions
Availability zone
Edge location
Storage service category
AWS storage services
Amazon S3 bucket
Used for [large group of users]
use
AWS storage gateway file gateway
① Amazon Simple Storage Service (Amazon S3) → which is an object storage service that offers scalability, data availability, security and performance
② Amazon Elastic Block Store (Amazon EBS) → which is a high performance block storage designed for use with Amazon EC2 for both throughput and transaction-intensive workloads
③ Amazon Elastic File System (Amazon EFS) → This storage service provides a scalable fully managed elastic network file system, also known as NFS, for use within AWS cloud services and on-premise resources.
④ Amazon Simple Storage Service Glacier (S3 Glacier) → which is secure, durable and extremely low cost AWS S3 cloud storage class for data archiving and long-term backup
Amazon SNS
Amazon SQS
cloud Adoption Framework
AWS glue
AWS Quicksight
AWS Storage Gateway → (Big Board of Backup)
Amazon GuardDuty (threat)
Amazon Inspector
Compute service
AWS Compute
① Amazon EC2
② Amazon EC2
③ Amazon Ela
④ Amazon E
⑤ AWS E
⑥ AWS
⑦ Amazon
⑧ AWS
Database
AWS
① Amaz
② Ama
③ Ama
④ Ama
Netw
AWS
① Am
② El
③ A
④ A
⑤ A
⑥ A
⑦ A

- Compute service category

AWS compute services

① Amazon EC2 (or Amazon Elastic compute cloud) → complete control over your AWS that provides resizable compute capacity as virtual machines in the cloud

② Amazon EC2 auto scaling → It enables you to automatically add or remove EC2 instances according to the conditions that you define.

③ Amazon Elastic Container Service (Amazon ECS) → It is a highly scalable, highly performance container orchestration service that supports Docker containers.

④ Amazon EC2 container registry → also known as Amazon ECR, this service is a fully managed Docker container registry that makes it easy for developers to store, manage and deploy Docker container images.

⑤ AWS Elastic Beanstalk → It is a service for deploying and scaling web applications and services on familiar servers, such as Apache and Microsoft internet information services, IIS.
The service which deploy, scale your web application automatically.

⑥ AWS Lambda → which enables you to run code without provisioning or managing servers. You pay only for the compute time that you consume. There is no charge when your code is not running.

⑦ Amazon Elastic Kubernetes Service (Amazon EKS) → makes it easy to deploy manage and scale containerized applications that use Kubernetes on AWS.

⑧ AWS fargate → a compute engine for Amazon ECS that allows you to run containers without having to manage servers or clusters.

- Database service category

AWS Database services

① Amazon Relational Database Service (or Amazon RDS) → one easy to setup operate and scalable relational database in the cloud. It provides resizable capacity while automating time-consuming administration tasks, such as hardware provisioning, database setup, patching, and backups.

② Amazon Aurora → which is a MySQL and PostgreSQL compatible relational database. It is set up to be five-times faster than standard MySQL databases and three-times faster than standard Postgres databases.

③ Amazon Redshift → It enables you to run analytic queries against petabytes of data that is stored locally in Amazon. It delivers fast performance at any scale.

④ Amazon DynamoDB → A fully managed key value and document NoSQL database that delivers single-digit millisecond performance at any scale, with built in security, backup and restore, and in-memory caching.

- Networking and content delivery service category

AWS networking and content delivery services

① Amazon VPC (virtual private cloud) → which enables you to provision logically isolated sections of the AWS cloud to launch AWS resources in a virtual network that you define.

② Elastic Load Balancing → that automatically distributes incoming application traffic across multiple targets, such as Amazon EC2 instances, containers, IP addresses and Lambda function.

③ Amazon CloudFront → is a fast content delivery network, also known as a CDN, that securely delivers data, videos and applications and application programming interfaces, APIs, to customers globally with low latency and high transfer speeds. (edge location → faster delivery of my content)

④ AWS Transit Gateway → enables customers to connect their amazon virtual private clouds and their on-premises networks to a single centrally managed gateway.

⑤ Amazon Route 53 (DNS) → a scalable cloud domain name system web service designed to give you a reliable way to route end users to the internet applications. It translates URLs into the numeric IP addresses that computers used to connect to each other.

⑥ AWS Direct Connect → • Provides a way to establish a dedicated private network connection from your data center or office to AWS, which can significantly reduce costs and increase bandwidth throughput.

⑦ AWS VPN (or IPsec) → That provides a secure private tunnel for your network or device to the AWS global network

- Security, identity, and compliance service category

100%
- Believe in yourself
- Be confident

AWS security, identity, and compliance services

① AWS identity and Access management (IAM) → which enables you to manage access to AWS services and resources securely.

② AWS organizations → allows you to restrict what services and actions are allowed in your accounts.

③ Amazon Cognito → which lets you add user authentication and access control to your web and mobile apps.

④ AWS Artifact → Provides an on-demand access to AW security and compliance reports, as well as select online agreements

⑤ AWS Key management service (or AWS KMS) → enables you to create and manage encryption keys. You can use AWS KMS to control the use of encryption across a wide range of AWS services in your applications.

⑥ AWS shield → which is a managed distributed denial of service protection service that safeguards applications running on AWS.

- AWS cost management service category

AWS cost management services

① AWS cost and usage Report → which contains the most comprehensive set of AWS cost and usage data available, including additional metadata about AWS services, pricing and reservation.

② AWS Budgets → where you can set custom budgets that alert you when your AWS costs or usage exceeds, or is forecasted to exceed, your budgeted amount.

③ AWS cost explorer → has an easy-to-use interface that enables you to visualize and understand and manage your AWS and usage overtime.

- Management and governance service category

AWS management and governance service

① AWS management console → This is a service that is a web-based user interface for accessing your AWS account

② AWS Config → which is a service that helps you track resources inventory and changes.

③ Amazon Cloudwatch → allows you to monitor resources and applications.

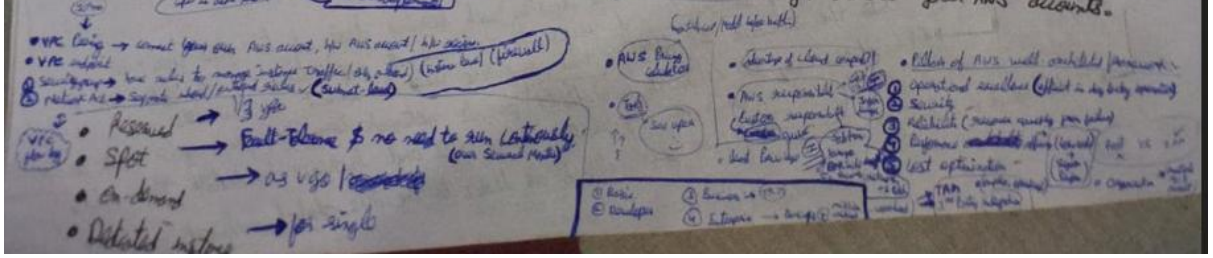
④ AWS auto scaling → It provides features that allow you to scale multiple resources to meet demand.

⑤ AWS command line interface (CLI) → which provides a unified tool to manage AWS services.

⑥ AWS Trusted advisor → It is an online tool which helps you optimize performance and security using AWS practices.

⑦ AWS well-architected tool → which provides help in reviewing and improving your workloads.

⑧ AWS CloudTrail → This service tracks user activity and API usage across your AWS accounts.



Two Differences between C++ and Java:

1. **Memory Management**:
   - **C++**: You manually manage memory using pointers, which can lead to memory leaks if not handled carefully.
   - **Java**: Java uses automatic garbage collection, which helps manage memory more safely.
2. **Platform Dependency**:
   - **C++**: Platform-dependent, meaning the code compiled on one operating system may not work on another without recompiling.
   - **Java**: Platform-independent due to the JVM (Java Virtual Machine), making it "write once, run anywhere."