PRITHWISH MANDAL

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Kolkata, West Bengal

# PROFILE

A software developer skilled in crafting efficient, dynamic applications, excelling in both backend and frontend development using complex DSA. Proficient in DevOps and AWS cloud, distributed computing, ensuring seamless integration, deployment, and scalable, secure infrastructure. Demonstrates flexibility in adapting to advances in technology and domain, contributing to a team using agile development methods and continuous integration. An excellent team player who learns, contributes, improves, and innovates. Proficient in Python automation, streamlining tasks and boosting productivity, embodying the future of software engineering. Excited about new opportunities to contribute skills and embrace new technologies.

# EXPERIENCE

## Software Developer, Ernst & Young

### Jan 2022- Till Now

* Proven ability to deliver CDP Private Cloud maintenance releases, debug system-level deployment issues, and develop Java, Scala, and Python solutions.
* Wrote clean and dynamic code, leveraging expertise across multiple programming languages to meet diverse requirements.
* Strong background in Hadoop ecosystem (Spark) and experience with high-availability systems.
* Adept at working in Linux environments, improving internal infrastructure, and performing root cause analysis for system failures.
* Designed and maintained highly available microservices running on AWS EKS (Kubernetes clusters).
* Implemented load balancing strategies using AWS ALB to ensure continuous availability.
* Set up multi-region and multi-AZ deployments to minimize downtime and improve resilience and worked on horizontal and vertical scaling strategies for efficient resource utilization.
* Utilized advanced knowledge of Python, JavaScript to develop high-quality, scalable code for various clients.
* Designed auto-scaling mechanisms in AWS/Azure to handle high loads dynamically.
* Built and optimized distributed applications using Spark, Kafka, and NoSQL databases (DynamoDB).
* Developed a Flask (Python & JavaScript) backend for real-time monitoring of file processing counts across interfaces, with data sourced from an RDS database updated by Python-based AWS Lambda functions.
* Engineered advanced automation solutions for complex data engineering tasks using Python in AWS Lambda, optimizing data workflows and enhancing system efficiency.
* Developed a sophisticated alert mechanism using AWS resources and Python in Lambda functions, sending notifications to MS Teams and email when CPU and memory thresholds are exceeded.
* Developed a Python-based Fast API application for deploying various cloud resources, including servers and related infrastructure in AWS.
* Developed a Django application for monitoring server, database, AWS resource utilization, and API health. Data is collected hourly, sent to CloudWatch Logs, and visualized for users. Added monthly report downloads, graphical flow analysis, and integrated ML for breach prediction with GenAI for actionable insights.
* Deployed a Django app on AWS with Docker, Helm, Kubernetes (EKS), and ECR, ensuring  
  ensuring seamless deployments.
* Developed CI/CD pipelines with AWS CodeBuild and GitHub Actions, implementing automated workflows, GitOps, and best practices for security and scalability. Collaborated on processes and documentation.
* Integrated shift-left security into CI/CD pipelines with SonarQube for early scans and continuous monitoring.
* Managed Kubernetes (EKS+ECR) for production environments across multiple clients.
* Used AWS services (EC2, S3, RDS) and Terraform for scalable, cost-efficient application deployment and management, ensuring high availability and optimized performance.
* Monitored and troubleshot CI/CD pipeline issues, resolving bottlenecks and optimizing performance for reliable, efficient deployments.
* Worked with architects and stakeholders to align CI/CD processes with project goals and ensure smooth integration of workflows.
* Gained experience working with service mesh technologies, such as Istio to enhance microservices communication and management.
* Proficient in AWS services like EC2, S3, DynamoDB, RDS, EKS, IAM, VPC, SQS, and Lambda, with expertise in managing and optimizing scalable, high-availability solutions tailored to client needs.
* Experienced in AWS monitoring and logging with CloudWatch for real-time alerts, X-Ray for tracing, and CloudTrail for logging and auditing. Configured dashboards and metrics to ensure application health, proactively resolve issues, and optimize resource usage.
* Designed and deployed an automated Azure DevOps pipeline to provision over 60000 servers with Terraform, utilizing a three-stage template structure. Integrated with ServiceNow to dynamically populate Terraform scripts via Python and send real-time notifications upon pipeline completion.
* Developed and managed Ansible scripts for automated package installations, with scripts versioned in Azure DevOps. Leveraged Ansible Tower for streamlined, scalable deployment and configuration management across environments.
* Served as a Migration Engineer for multiple clients, successfully orchestrating the migration of on-premises servers to cloud environments, ensuring seamless transitions and optimized cloud configurations.
* Developed a GenAI agent using the Autogen Framework to detect resource anomalies post- migration by integrating Azure Monitor, Azure Sentinel, Azure App Insights, and Azure Advisor. Leveraged Python for data analysis and KQL queries to identify logs related to anomalies. Built a Flask-based application to store these anomalies in a PostgreSQL database, which is now deployed in production and used by multiple clients.
* Configured distributed logging & monitoring using ELK Stack (Elasticsearch, Kibana), Prometheus, and Grafana.
* Conducted failure analysis & RCA (Root Cause Analysis) for distributed system failures, improving system resilience.
* Worked on distributed databases with eventual consistency and strong consistency models (Cassandra) and managed replication and sharding strategies for SQL databases to ensure data durability.
* Implemented auto-recovery mechanisms using Kubernetes self-healing features, improving system reliability. Configured Liveness Probes, Readiness Probes, Pod Disruption Budgets, Cluster Autoscaler, HPA, VPA.
* Developed a Flask-based (Python & JavaScript) backend for real-time analytics of file processing metrics using AI and ML algorithms, including LSTMs and Random Forests, for anomaly detection and trend analysis. Leveraged an RDS database updated via Pythonpowered AWS Lambda functions to enable seamless data integration and intelligent decision-making.
* Engineered advanced automation solutions for complex data engineering tasks using Python in AWS Lambda, leveraging ML algorithms like Gradient Boosting and K-Means for data optimization and feature engineering. Streamlined data workflows, ensuring efficient preprocessing, transformation, and integration to support machine learning pipelines and model deployment.
* Developed an AI-driven alerting system using Python-based AWS Lambda, leveraging algorithms like Isolation Forest and K-Means for anomaly detection in CPU and memory usage. Enabled real-time notifications to MS Teams and email, enhancing proactive decision-making and system reliability.
* Developed a GenAI-powered Django app for monitoring server and AWS resource utilization, using GenAI orchestrator agents and Autogen Framework for breach prediction. Data is collected hourly, visualized, and enriched with flow analysis and monthly reports for actionable insights.
* Implemented a custom AI chatbot for enterprise customer support using LangChain, integrating document retrieval, LLMs, and conversational AI. Enhanced query understanding and context-aware responses by leveraging vector databases for semantic search and chain-based reasoning, improving customer satisfaction and operational efficiency.
* Designed and implemented a sophisticated process within the Autogen framework using assistant agents, userproxy agents, and ChromaDB for data vectorization. This involved orchestrating tasks across a multi-agent pool of Scientists, Engineers, Code Writers, and Approvers. Utilized NLP for input analysis, executed code, managed API interactions, and ensured seamless database connectivity, leading to efficient and successful output delivery.
* Implemented an AI-driven system where data from a survey application is processed via AWS Lambda, stored in S3, and transformed with Glue. Trained a deep learning model using Twnsorflow in SageMaker for analytics, with real-time predictions via the SageMaker endpoint. Automated workflows using EventBridge and visualized insights on a Bedrock-integrated dashboard.
* Experienced in AI-driven AWS monitoring, leveraging CloudWatch for real-time alerts, XRay for tracing, and CloudTrail for auditing. Integrated ML algorithms like Isolation Forest for anomaly detection and Linear Regression for trend analysis, optimizing resource usage and ensuring application health with dynamic dashboards and metrics.
* Enhanced CI/CD test automation for Big Data components, reducing regression failures in multi-cluster environments.
* Gained experience with data structures and algorithms in production environments, addressing diverse problems using advanced techniques such as hash tables, binary search trees, dynamic programming, and graph algorithms like Dijkstra's and A\* for efficient data manipulation.

## Data Analyst Intern, Data Peace AI Technologies Pvt Ltd

### Feb 2021- July 2022

* Developed an NLP-based chatbot using machine learning to analyze customer conversations and deliver optimal responses. Applied tokenization, lemmatization, and TF-IDF for text preprocessing, utilized sentiment analysis with VADER, and trained the model with LSTM networks to generate sentiment-driven replies.
* Developed a flight availability prediction api using deep learning neural networks, leveraging provided datasets and weather conditions to forecast flight statuses for specific dates and times.
* Utilized computer vision algorithms to extract Aadhaar card numbers from images using OCR and deep learning techniques for accurate text recognition and parsing.

## Software Developer Intern, Global Technology & Communication Solutions Pvt Ltd

### Feb 2020- Dec2020

* Gained in-depth expertise in various coding languages, including C++, C# and JavaScript.
* Created HTML templates, JavaScript files and CSS for UI module development.
* Developed a comprehensive School Management System from scratch using C#, ASP.NET, HTML, CSS, and JavaScript, incorporating all essential features.
* Implemented advanced SQL functions in SQL Server to support complex queries and optimize application performance.
* Gained experience with data structures and algorithms in production environments, addressing diverse problems using advanced techniques such as hash tables, binary search trees, dynamic programming

# EDUCATION

2018 - 2022

### KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY, KIIT UNIVERSITY

**Bachelor of Technology, Computer Science C*GPA: 8.0/10***

# KEY SKILLS

* **Programming Language**: Python, JavaScript, Scala, C#, C, Go
* **Cloud Technologies**: AWS (Managed Services, Serverless, Kubernetes, IAAS, Machine Learning, Data Engineering, Monitoring, Logging, Analytics)
* **CI/CD**: GitLab CI/CD, Github Actions, Jenkins, Azure DevOps
* **Infrastructure As A Code (IAC)**: Terraform, Pulumi, CloudFormation.
* **Monitoring**: Prometheus, Grafana
* **Security Practices**: AWS SecuriyHub, Verracode
* **Database & Storage**: RDS, NoSQL, SQL, KX (Time-Series Database).
* **Big Data & Distributed Systems**: Hadoop, Spark, Impala, Iceberg, Livy
* **Infrastructure & Debugging**: System-level debugging, root cause analysis, performance optimization

CERTIFICATIONS

* AWS Certified Developer - Associate
* AWS Certified Cloud Practitioner
* AWS Certified SysOps Administrator
* Az-900
* Hashicorp Certified: Terraform Associate (002)

# ACHIEVEMENTS

* + EY Spot Award
  + Youngest Infrastructure Lead Engineer Award
  + DevOps Practitioner Award
  + AWS Automation Spot Award

# PROJECTS

#### Resource Comparator Tool:

Developed a comprehensive application with a Flask backend and a frontend using HTML, CSS, and JavaScript to compare the infrastructure of lower and upper environments. Implemented advanced data structures in Python to perform detailed comparisons and identify mismatches in infrastructure configurations.

#### AIOPS:

Developed a Django-based application to detect anomalies in cloud resources and provide GenAI-powered solutions for resolution. Employed Python scripts to extract and process anomaly data from various logs, storing the results in a MySQL database. The application then retrieved and displayed detailed information from RDS, integrating OpenAI's GenAI to offer actionable solutions for detected issues.

### *E*-Commerce Application:

Developed a fully featured e-commerce application using Flask, resembling a comprehensive online shopping platform like Amazon. Implemented end-to-end functionalities, including product listings, shopping cart management, and secure payment processing, to provide a complete and user-friendly shopping experience.