**Project Details:**

Design and build a resilient and scalable cloud-based web-scale microservice application.

Project Scenario

1. ABC Pvt Ltd. is a software application company. It has built an Web application (Document Services) that allows doctors to upload documents (eg. Scans of reports) and images (x-rays) along with meta-data about those documents.
2. Documents and images uploaded need to be accessed quickly for first 6 months but are infrequently accessed after that. After 3 years they can be archived.

Current On-premises Architecture:

Web Tier:

1. 1 Physical server (Two CPUs/4 GB Memory/50 GB storage)
2. Linux CentOS
3. Running Apache and PHP

Database Tier:

1. One Physical server.
2. Linux CentOS
3. MySQL Server
4. Database is backup night to an off-site backup provider.

Future Requirements:

* ABC Pvt. Ltd. has decided to use cloud technology to support the growth as high demand after Covid. IT Manager has decided to use AWS as cloud service provider and has chosen **your team** to accomplish the task.
* The system needs to be easily scalable as the business grows. In particular, compute, storage and database capacity need to be able to be expanded.
* Requires high availability and fault tolerance.
* Requires high durability of the documents and images uploaded by doctors.

Your Tasks:

* Identify single point of failure of the current On-premises system.
* Identify and discuss the components of the system that prevent the capacity from being easily expanded.
* Design a cloud-based implementation of Document Services. The Document Service will have a web page interface to enable doctors to interact with it.
  + Clearly describe function of each service that you choose for cloud-based implementation.
  + Identify in your architecture, what are the responsibilities of AWS and ABC Pvt. Ltd.
* Create an AWS architecture diagram showing you cloud-based implementation such as VPC, Availability Zones, Subnets, Internet Gateways, Web Servers (Ec2 instances), Elastic Load Balancers, Autoscaling etc) and links between the services.
  + Web Servers in public subnet and database server in private subnet.
  + Describe the type, size and justification for EC2 instances that you will use.
  + Describe and justify the type of database you purpose
    - Managed/unmanaged
    - DB engine
    - DB instance type (if applicable)
  + The website should only be accessible via the Elastic load balancer.
  + Images and documents should be stored in S3 and metadata (FirstName, LastName, Data of Birth, Address, Phone Number of Patients, Patient ID, Doctor ID, Date and Time of Upload, Comments) should be stored in database.
    - No need to normalize the database at this stage.
  + Once document is upload, it must notify the administrator (Must use Lambda function and SNS).
* Perform Functional testing to verify images/documents are stored in S3 and meta-data stored in database.
* Perform Availability testing to verify autoscaling and multi-az deployment is working successfully.

What to Submit:

1. Documentation of your cloud-based web scale implementation.
2. Architectural Diagram.
3. Demonstrate your implementation (Everything required for this project comes under free tier. Make sure you stop your resources when not in use).

What I will provide (if required):

* A web page that includes a web-form.
* PHP/Python code to connect to database and S3.