Cycle 08 AWS Homework

1. GitHub Version Control

- **Topics to Learn:**

  - Branching: Create and switch branches to isolate features or fixes.

    - `git branch <branch-name>`

    - `git checkout <branch-name>` or `git switch <branch-name>`

  - Merging: Combine code from different branches.

    - `git merge <branch-name>` (into the current branch)

  - Pull Requests (PRs): Submit changes for review before merging into main.

    - Create PR on GitHub UI after pushing your branch.

  - Version control best practices:

    - Use descriptive commit messages.

    - Keep commits small and focused.

    - Rebase or squash before merging if required.

- **Practice:**

  - Create a personal test repository.

  - Practice creating branches, making commits, and merging with PRs.

2. Docker Auto-Restart Behavior

- **Objective:** Ensure Docker containers restart automatically on system reboot or crash.

- **Solution:**

  - Use `-restart` flag in `docker run`:

- - - **-restart=always** : Always restart container.

    - **-restart=unless-stopped** : Restart unless stopped manually.

  - Example:

    ```bash
    bash
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    docker run -d --name myapp --restart=unless-stopped nginx
    ```

- **Verify:**

  - Reboot the machine and use **docker ps** to check if the container restarted.

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3. AWS S3 - Public vs. Private Objects

- **Key Concepts:**

  - Buckets and objects are private by default.

  - Access control options:

    - Bucket policies

    - Object ACLs (Access Control Lists)

    - IAM user/role permissions

  - To make an object public:

    - Set ACL to **public-read** or apply bucket policy allowing **s3:GetObject** .

- **Security Best Practices:**

  - Avoid public access unless necessary.

  - Use bucket-level public access block settings.

  - Enable logging and versioning for tracking.

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4. AWS S3 - Static Website Hosting

- **Steps:**

- Create an S3 bucket with a unique name.

- Disable "Block all public access".

- Upload HTML, CSS, JS files.

- Enable static website hosting in bucket properties.

- Set index and error document (e.g., `index.html`, `error.html`).

- Add bucket policy to allow public read:

```json
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{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "PublicReadGetObject",
      "Effect": "Allow",
      "Principal": "*",
      "Action": "s3:GetObject",
      "Resource": "arn:aws:s3:::your-bucket-name/*"
    }
  ]
}
```

5. Auto-Scaling Debugging [Extension]

- **Common Debugging Areas:**
  - Launch template misconfigurations

  - Health checks not passing (ALB/EC2)

  - IAM role permissions missing

  - Scaling policies not triggering

- **Checklist:**

- Check logs (CloudWatch, system logs)

- Review ASG events

- Validate scaling policy thresholds

- Test with manual scale-up/down