**Question:**

create a sample web application using GitHub as the source code repository, AWS CodePipeline for the CI/CD pipeline, and AWS CodeBuild for the build process.

**Answer:**

We'll create a simple static web application using HTML, CSS, and JavaScript.

## Step 1: Set up the GitHub Repository

1. Sign in to your GitHub account or create a new one if you don't have one.

2. Create a new repository on GitHub and give it a name, e.g., "sample-web-app."

3. Initialize the repository with a README file (optional).

4. Create a new directory on your local machine to store the web application files.

5. Create your sample web application files (index.html, styles.css, script.js) in the local directory.

6. Add, commit, and push these files to the GitHub repository.

## Step 2: Create an IAM Role for CodePipeline and CodeBuild

1. Go to the IAM (Identity and Access Management) service in the AWS Management Console.

2. Click on "Roles" in the left-hand menu and then click on "Create Role."

3. Select "AWS service" as the trusted entity.

4. Choose "CodePipeline" as the service that will use this role.

5. Click "Next: Permissions."

6. Attach policies that grant permissions for your source code repository (e.g., CodeCommitFullAccess if using CodeCommit) and CodeBuild (e.g., AWSCodeBuildAdminAccess).

7. Proceed through the rest of the steps, providing a name and description for your IAM role.

## Step 3: Create the CodePipeline

1. Go to the AWS CodePipeline service in the AWS Management Console.

2. Click on "Create pipeline."

3. Provide a name for your pipeline, e.g., "SampleWebAppPipeline," and click "Next."

4. In the "Source" stage:

- Choose your source provider as "GitHub."

- Click "Connect to GitHub" and follow the steps to link your GitHub account.

- Select the repository you created in Step 1 and set the branch to "main" (or "master" depending on your default branch name).

- Click "Next."

5. In the "Build" stage:

- Choose "AWS CodeBuild" as the build provider.

- Click "Create project" to configure the CodeBuild project.

6. In the CodeBuild project configuration:

- Provide a name for your project, e.g., "SampleWebAppBuild."

- Choose "Use an existing build image."

- For "Operating system," select "Ubuntu."

- For "Runtime," select "Standard."

- For "Image," choose "aws/codebuild/standard:5.0."

- For "Build specification," choose "Use the buildspec.yml in the source code root directory."

- Leave the environment settings as default, but you can customize them based on your requirements.

- Click "Continue to CodePipeline" to go back to the pipeline setup.

7. In the "Deploy" stage:

- For the deployment provider, select "No deployment."

8. Review your pipeline configuration, and if everything looks good, click "Create pipeline" to create your CodePipeline.

## Step 4: Create a buildspec.yml file

1. In your GitHub repository, create a new file named "buildspec.yml" in the root directory.

2. Add the following content to the "buildspec.yml" file:

```yaml

version: 0.2

phases:

install:

runtime-versions:

nodejs: 14

pre\_build:

commands:

- echo "Installing dependencies..."

- npm install

build:

commands:

- echo "Building the web application..."

- npm run build

artifacts:

files:

- '\*\*/\*'

```

This buildspec file specifies the steps CodeBuild should follow to build your web application.

## Step 5: Test the CodePipeline

1. Make changes to your web application files in the GitHub repository.

2. Push the changes to the repository.

3. Go to the AWS CodePipeline console and monitor the pipeline's progress.

4. The pipeline will automatically trigger CodeBuild to build your web application using the buildspec.yml file.

5. After the build is successful, you'll find the build artifacts in the CodeBuild artifacts section.

That's it! You now have a sample web application set up with GitHub as the source code repository, AWS CodePipeline for the CI/CD pipeline, and AWS CodeBuild for the build process. You can further enhance the pipeline to include deployment to a web server or hosting service if needed.