

[version\_1.0]

## Note

The exercises in this course will have an associated charge in your AWS account. In this exercise, you will create the following resources:

- AWS CodePipeline pipeline

**This exercise includes instructions to delete all the resources that you created in the exercises.**

Familiarize yourself with [AWS CodePipeline pricing](#) and the [AWS Free Tier](#).

# Exercise: Creating a Pipeline

In this exercise, you will first start by using AWS CodePipeline to create a new pipeline. You will create a new feature branch in your repository and edit some application code. You will then commit the changes to your feature branch and merge the feature branch into your main branch.

## Task 1: Creating a pipeline

In this task, you use AWS CodePipeline to create a pipeline.

1. In the console, choose **Services**, and search for and select **CodePipeline**.
2. Choose **Create pipeline**.
3. For **Pipeline name**, enter `trivia-pipeline` and choose **Next**.
4. In the **Add source stage** step, configure the following settings:
  - **Source provider:** *AWS CodeCommit*
  - **Repository name:** *trivia-app*
  - **Branch name:** *main*
5. Choose **Next**.
6. In the **Add build stage** step, configure the following settings:
  - **Build provider:** *AWS CodeBuild*
  - **Project name:** *trivia-unittests*

7. Choose **Next**.
8. In the **Add deploy stage** step, choose **Skip deploy stage** and then choose **Skip**.
9. In the **Review** step, choose **Create pipeline**. You should see a *Success* message.

## Task 2: Creating a feature branch

In this task, you create a new feature branch in your AWS CodeCommit repository.

1. In a separate browser tab, switch to the **AWS Cloud9** development environment. Make sure that you are in the `trivia-app` directory.

```
cd ~/environment/trivia-app
```

Create a feature branch by running the following command:

```
git checkout -b feature-bonus-scores
```

You should see that you created a new branch and switched to that branch:

```
Switched to a new branch 'feature-bonus-scores'
```

## Task 3: Editing the code

In this task, you edit the code to implement a bonus scores feature.

1. Open the `trivia-app/back-end-python/gameactions/app.py` file.
2. In the `trivia_calculate_scores` function, locate the code where `last_answer` is set.
3. On the next line, add code to set the `bonus` variable:

```
last_answer = connection["lastAnswer"] if "lastAnswer" in connection else ""  
bonus = question["bonus"] if "bonus" in question else 0
```

4. You also need to add the `bonus` variable to the calculation logic. Update the code incrementing `score` so that it includes `bonus`.

Code before:

```
if last_question_id == question["id"] and last_answer == question["answer"]:  
    score += 20
```

Code after:

```
if last_question_id == question["id"] and last_answer == question["answer"]:
    score += 20 + bonus
```

5. Save the file.
6. You also need to update the unit tests code so that it tests the new bonus score. Open the `trivia-app/back-end-python/tests/unit/test_handler.py` file.
7. Replace `SCORES_EVENT` with a new event that includes a bonus score:

```
SCORES_EVENT = {
    "gameid" : "01234567012301230123012345678901",
    "questions" : [
        { "id" : "q-1111", "question" : "Good question?", "answer" : "Yes", "bonus": 20},
    ],
    "iterator" : { "questionpos" : 0 }
}
```

Save the file.

8. Find the `test_trivia_calculate_scores_correct` section and change the assert statements to expect a score of 40.

```
app.TABLE.update_item.assert_called_with(
    Key={'gameId': '01234567012301230123012345678901', 'connectionId': 'connection-1'},
    AttributeUpdates={'score': {'Value': 40, 'Action': 'PUT'}}
)

app.MANAGEMENT.post_to_connection.assert_has_calls([
    mock.call(Data={'action': "playerlist", "players": [{"connectionId": "connection-1", "playerName": "AliceBlue", "score": 40, "currentPlayer": tr
    mock.call(Data={'action': "gameover"}, ConnectionId='connection-1')
])
```

9. Save the file.
10. Verify that the code is stable by running the unit test.

```
./local_build.sh
```

You should see that everything passed.

11. (Optional) You can verify that the coverage is still 100 percent by previewing the `htmlcov/index.html` file.

## Task 4: Committing and merging the new code

In this final task, you commit the new code to your feature branch in AWS CodeCommit. You then merge the changes into the `main` branch.

1. In the **AWS Cloud9** terminal, view the status of your git repository by running the following command:

```
git status
```

You should see that status of the two files changed to *not staged for commit*.

```
modified:   back-end-python/gameactions/app.py
modified:   back-end-python/tests/unit/test_handler.py
```

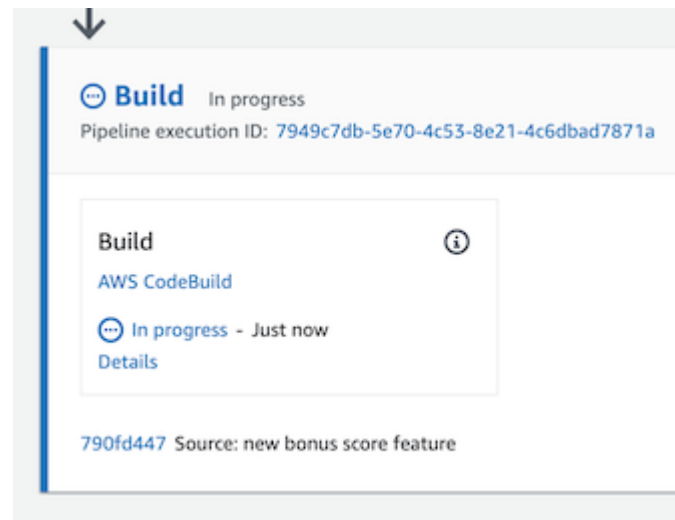
2. Add the files, create a commit, and push the changes to the `origin` remote.

```
git add *
git commit -m "new bonus score feature"
git push origin feature-bonus-scores
```

As of now, you haven't made any changes to the `main` branch yet.

3. Switch back to the **CodePipeline** tab.
4. Choose **Services** and then select **CodeCommit**.
5. In CodeCommit, open the `trivia-app` repository and in the navigation pane, choose **Commits**.
6. On the right, view the bonus score commit by opening the dropdown menu with `main` and selecting `feature-bonus-scores`.
7. At the top of the window, choose the `trivia-app` breadcrumb.
8. Choose **Create pull request**.
9. For **Destination**, keep `main` selected and for **Source**, choose `feature-bonus-scores`.
10. Choose **Compare**. You can scroll down to see the code changes that you made.
11. In **Details > Title**, enter `New feature: Bonus scoring`. Choose **Create pull request**.
12. Choose **Merge**.
13. Keep both **Fast forward merge** and **Delete source branch feature-bonus-scores after merging?** selected. Choose **Merge pull request**.
14. In the navigation pane, see the new merge commit by choosing **Commits**.

14. In the navigation pane, see the new merge commit by choosing **Commits**.
15. In the navigation pane, open the **CodePipeline** console by choosing **Pipeline > Pipelines**.
16. View the pipeline details by opening **trivia-pipeline**. In the **Source** section, you should see the new commit: *Source: new bonus score feature*
17. Review the **Build** section. The recently merged commit on the `main` branch triggered a pipeline build.



pipeline\_build

18. Switch back to the **AWS Cloud9** tab.
19. The new features you committed have been merged to `main`. Update the main branch locally by running the following commands:

```
git checkout main
git pull origin main
git log
```

In the Git log, you should see the *new bonus score feature* commit.

## Task 5: Deleting all exercise resources

Congratulations! You have successfully completed the course project. In this task, you delete the AWS resources that you created for this project.

1. Open the **AWS CodePipeline** console.
  - Delete the **trivia-pipeline** pipeline.
  - Delete the **trivia-unittests** build project.
2. Open the **AWS CodeCommit** console.
  - Delete the **trivia-app** repository.
3. Open the **Amazon Simple Storage Service (Amazon S3)** console.
  - Empty and delete the **-trivia-app-bucket**.
  - Empty and delete the **aws-sam-cli-managed-default-samclisourcebucket-** bucket.

- Empty and delete the **codepipeline-** bucket.
- 4. Open the **AWS CloudFormation** console.
  - Delete the **trivia-app** stack.
  - Delete the **aws-sam-cli-managed-default** stack.
- 5. Open the **AWS Identity and Access Management (IAM)** console.
  - Delete the following IAM roles.
    - **AWSCodePipelineServiceRole-<region>-trivia-pipeline**
    - **codebuild-trivia-unittests-service-role**
    - **cwe-role-region-trivia-pipeline**
- 6. Open the **AWS Cloud9** console.
  - Delete the **trivia-game** environment.

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