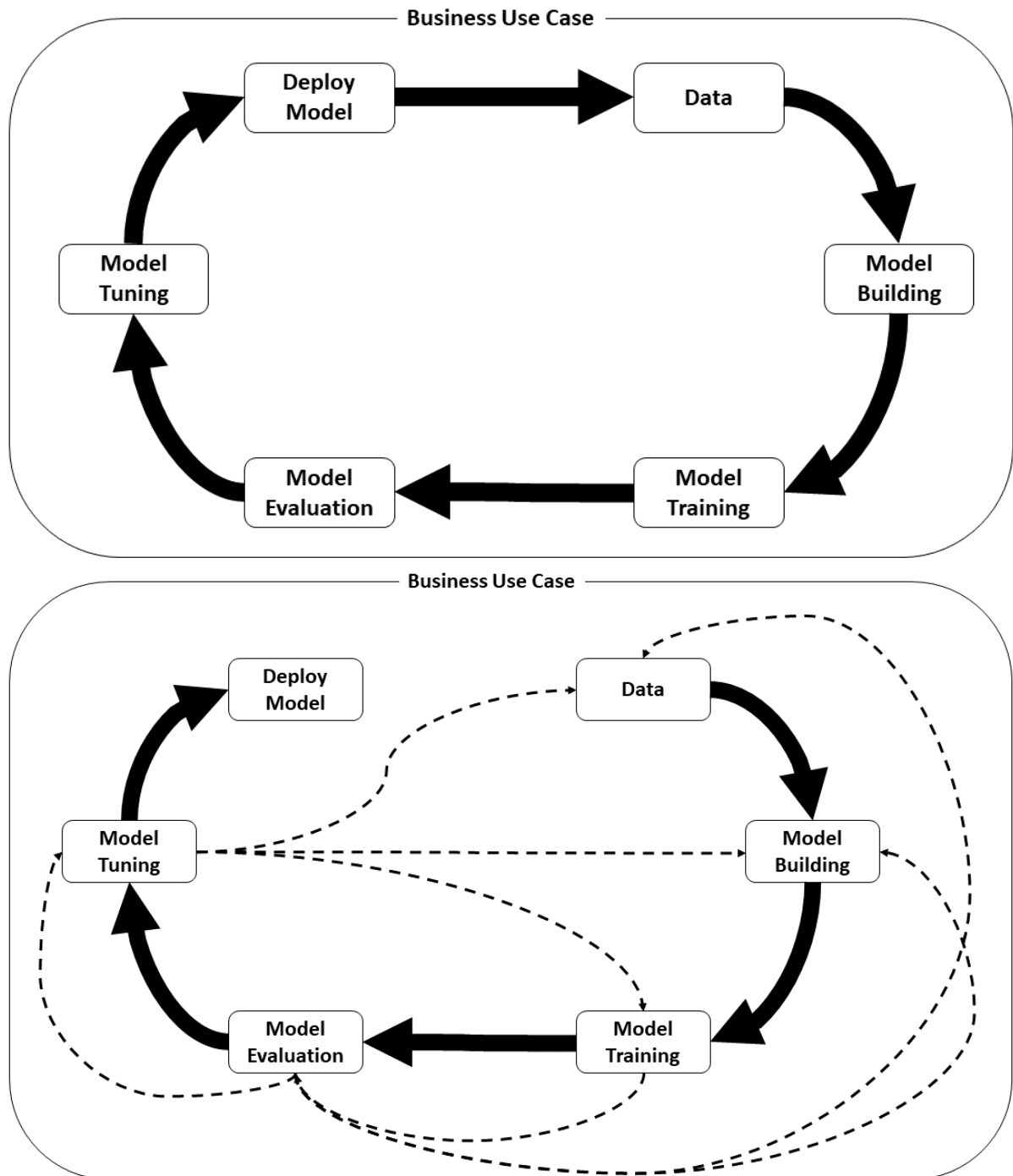


Chapter 1: Getting Started with Automated Machine Learning on AWS



Business Use Case

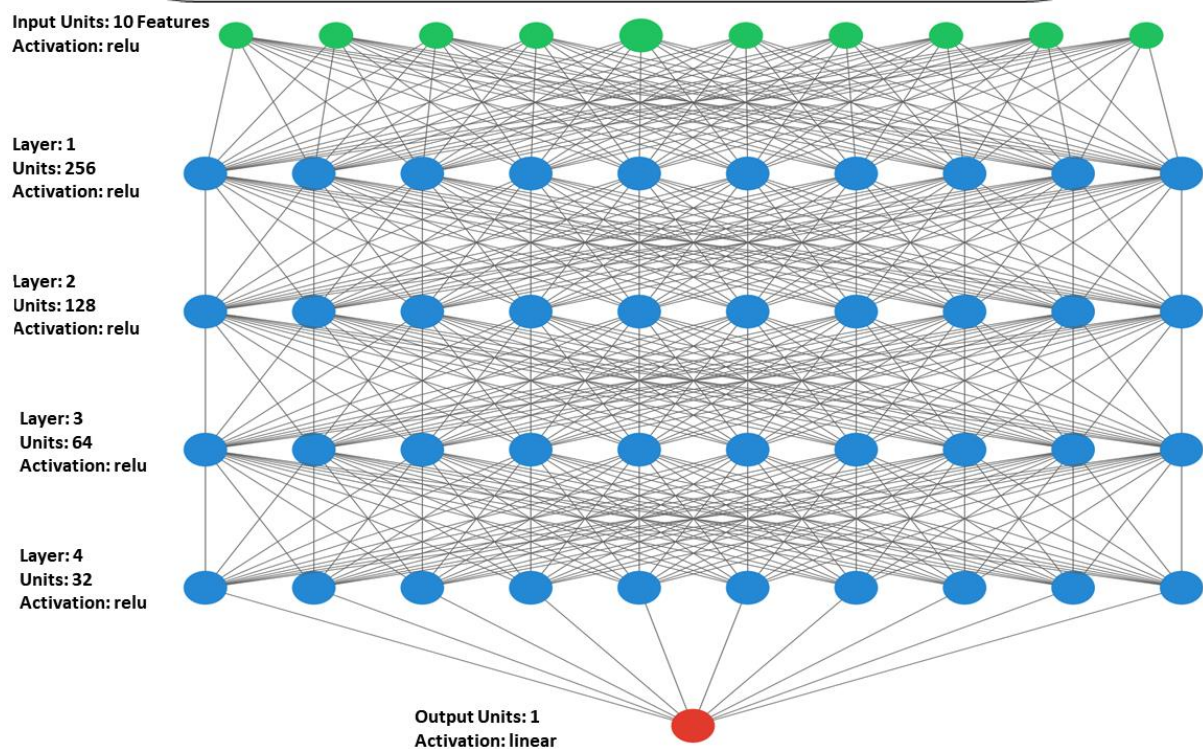
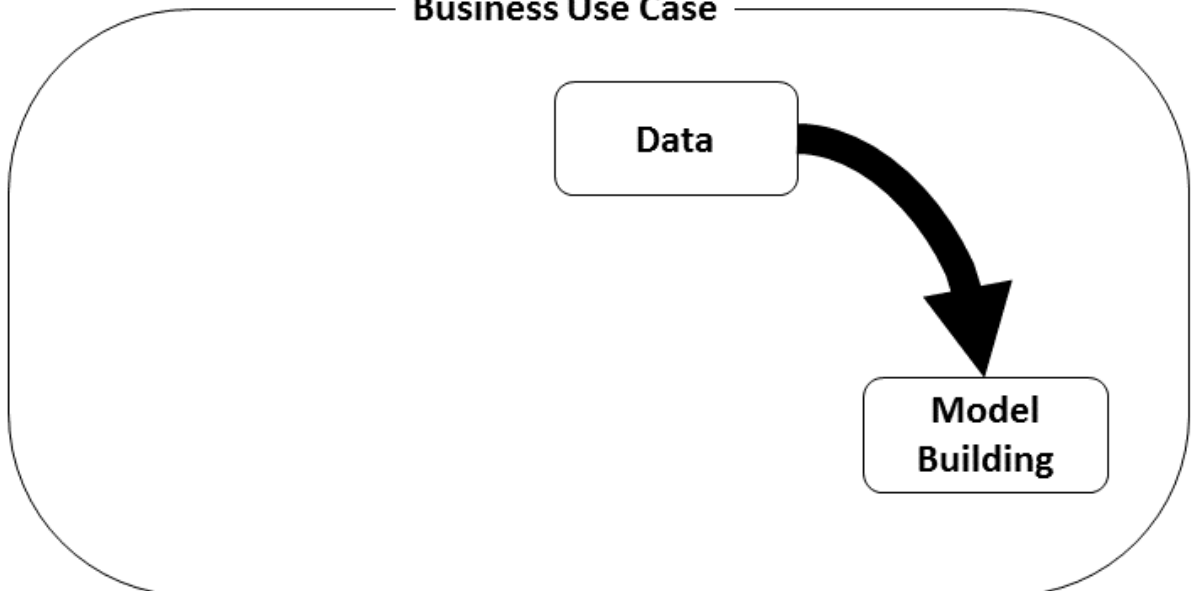
Business Use Case

Data

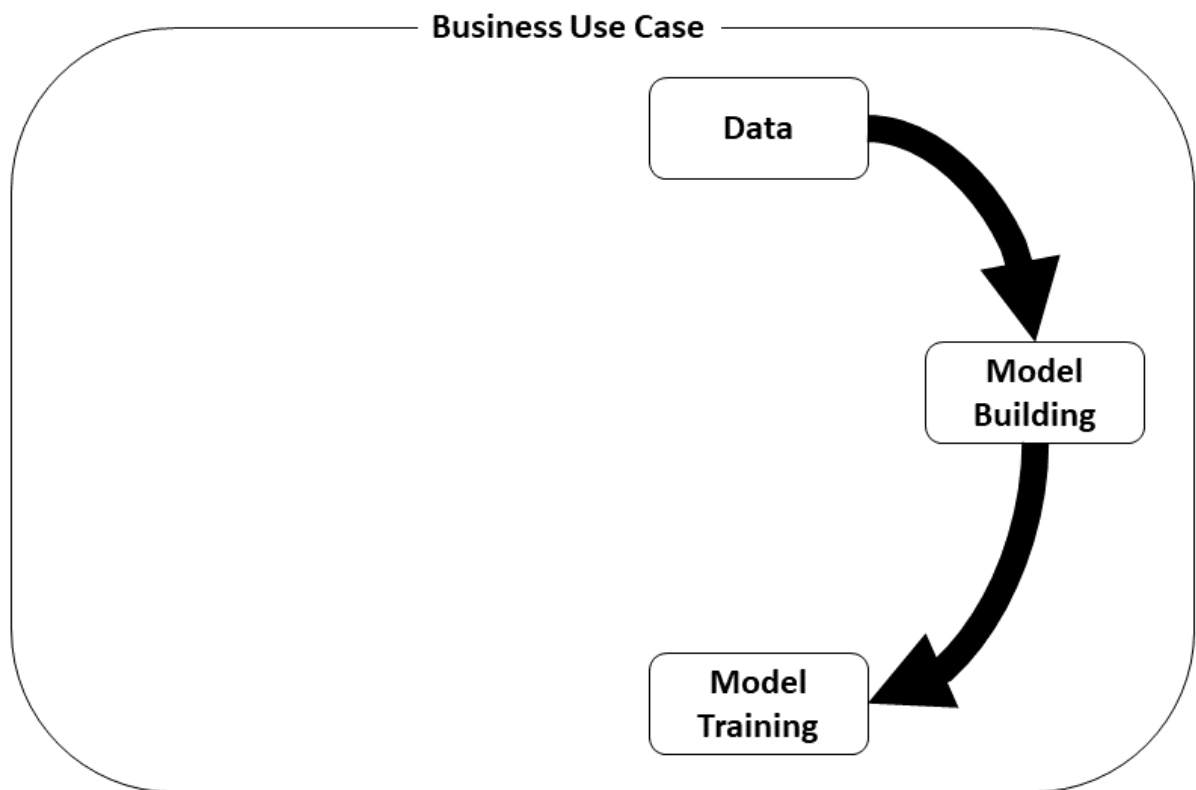
	sex	length	diameter	height	whole_weight	shucked_weight	viscera_weight	shell_weight	rings
0	M	0.455	0.365	0.095	0.5140	0.2245	0.1010	0.150	15
1	M	0.350	0.265	0.090	0.2255	0.0995	0.0485	0.070	7
2	F	0.530	0.420	0.135	0.6770	0.2565	0.1415	0.210	9
3	M	0.440	0.365	0.125	0.5160	0.2155	0.1140	0.155	10
4	I	0.330	0.255	0.080	0.2050	0.0895	0.0395	0.055	7
		length	diameter	height	whole_weight	shucked_weight	viscera_weight	shell_weight	rings
count		4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000
mean		0.523992	0.407881	0.139516	0.828742	0.359367	0.180594	0.238831	9.933684
std		0.120093	0.099240	0.041827	0.490389	0.221963	0.109614	0.139203	3.224169
min		0.075000	0.055000	0.000000	0.002000	0.001000	0.000500	0.001500	1.000000
25%		0.450000	0.350000	0.115000	0.441500	0.186000	0.093500	0.130000	8.000000
50%		0.545000	0.425000	0.140000	0.799500	0.336000	0.171000	0.234000	9.000000
75%		0.615000	0.480000	0.165000	1.153000	0.502000	0.253000	0.329000	11.000000
max		0.815000	0.650000	1.130000	2.825500	1.488000	0.760000	1.005000	29.000000

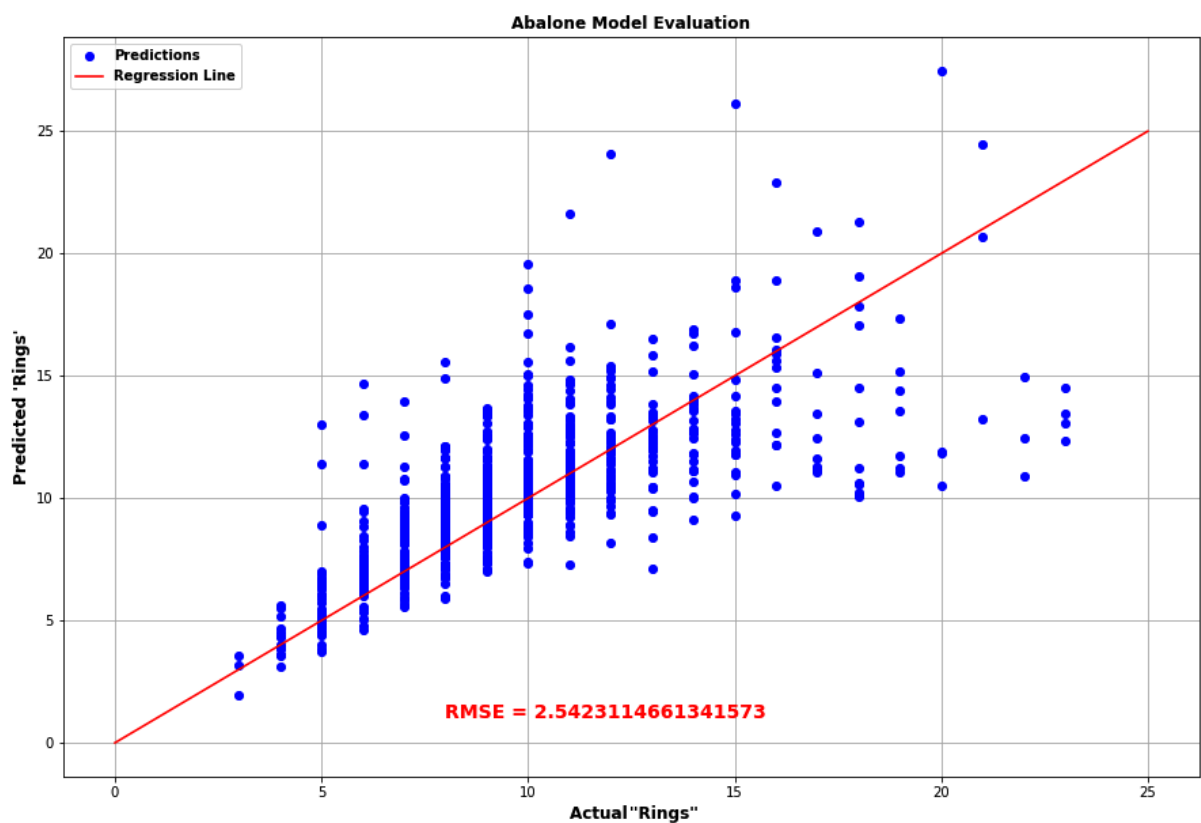
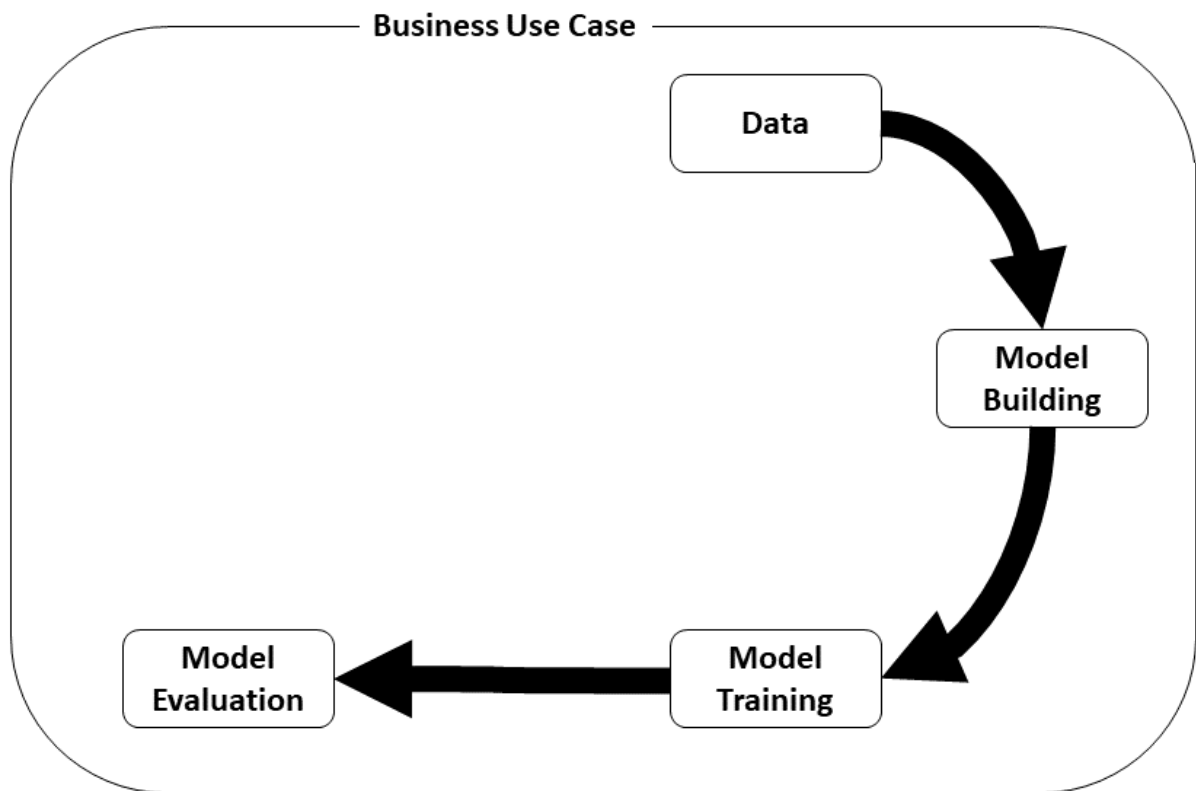
	length	diameter	height	whole_weight	shucked_weight	viscera_weight	shell_weight	rings	sex_F	sex_I	sex_M
0	0.455	0.365	0.095	0.5140	0.2245	0.1010	0.150	15	0	0	1
1	0.350	0.265	0.090	0.2255	0.0995	0.0485	0.070	7	0	0	1
2	0.530	0.420	0.135	0.6770	0.2565	0.1415	0.210	9	1	0	0
3	0.440	0.365	0.125	0.5160	0.2155	0.1140	0.155	10	0	0	1
4	0.330	0.255	0.080	0.2050	0.0895	0.0395	0.055	7	0	1	0

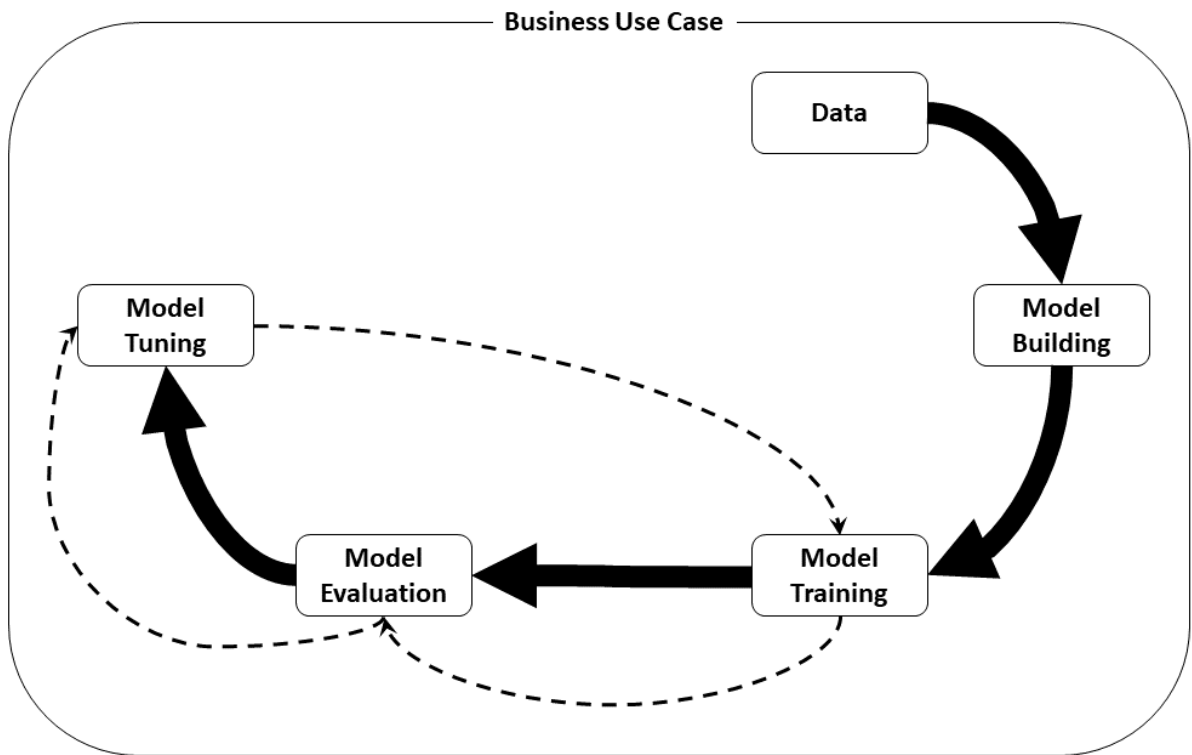
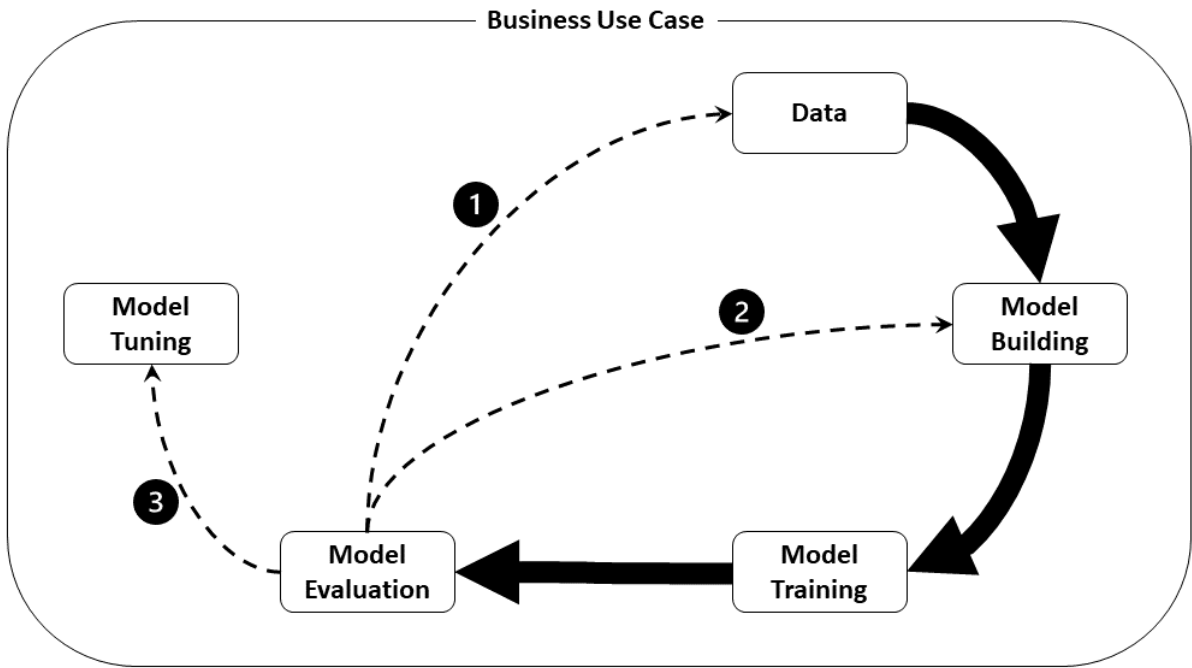
Business Use Case

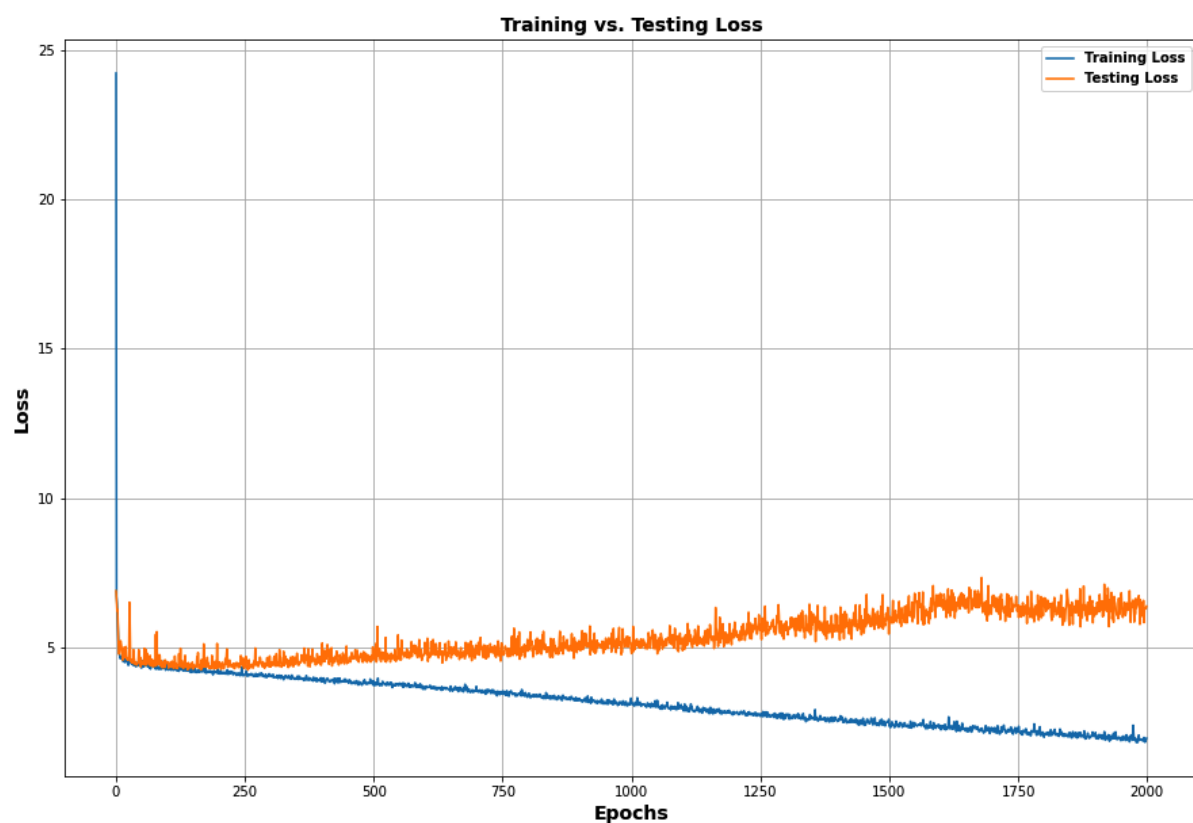


Layer (type)	Output Shape	Param #
dense (Dense)	(None, 256)	2816
dense_1 (Dense)	(None, 128)	32896
dense_2 (Dense)	(None, 64)	8256
dense_3 (Dense)	(None, 32)	2080
dense_4 (Dense)	(None, 1)	33
Total params: 46,081		
Trainable params: 46,081		
Non-trainable params: 0		

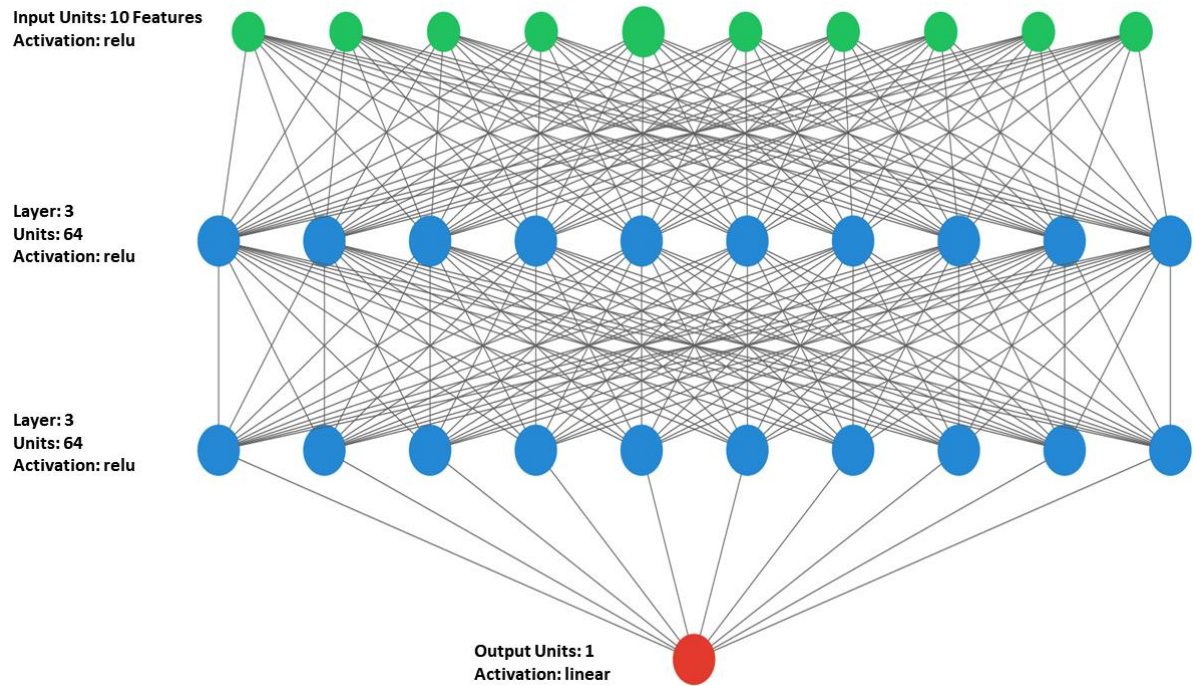


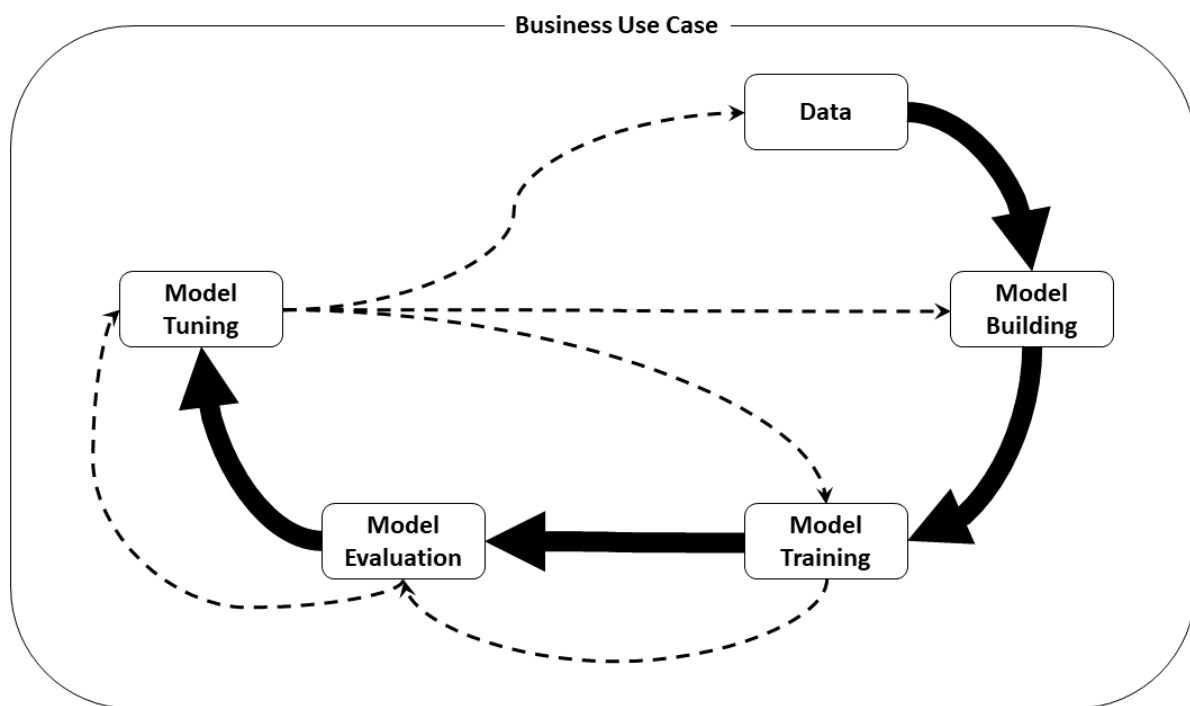
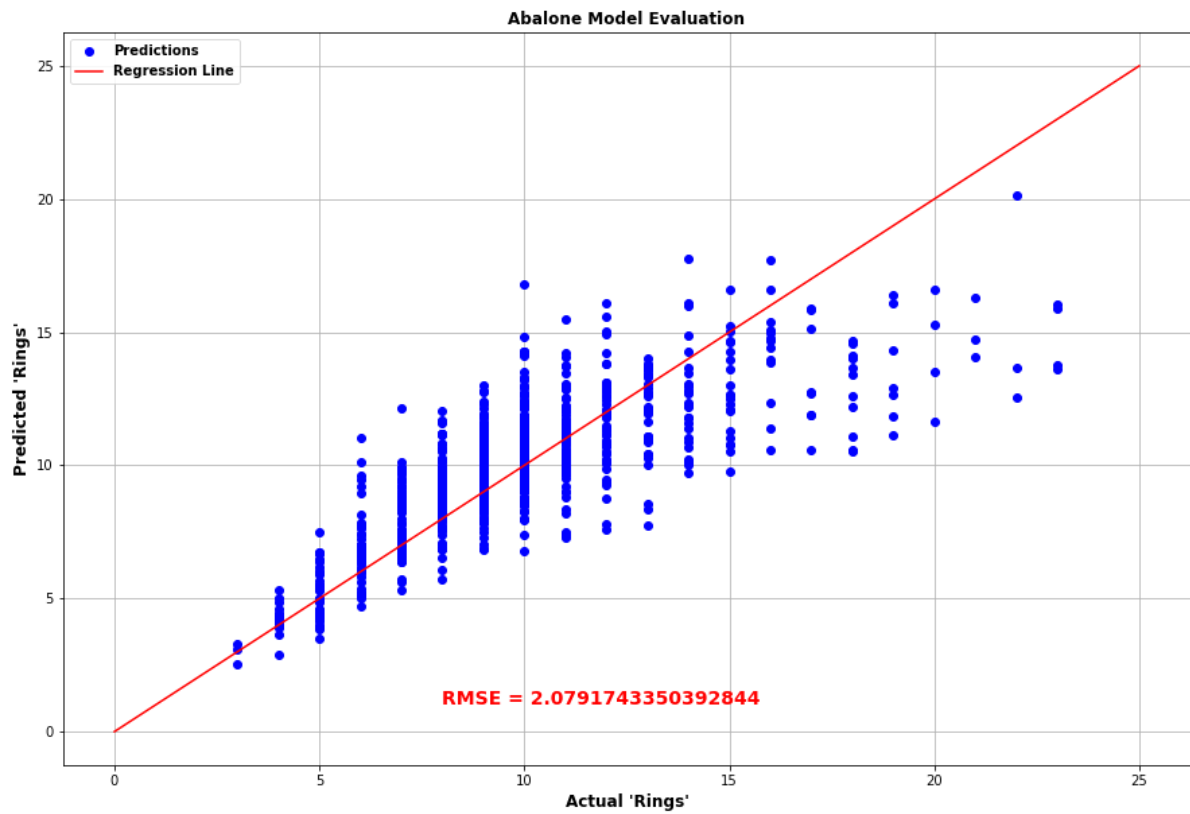


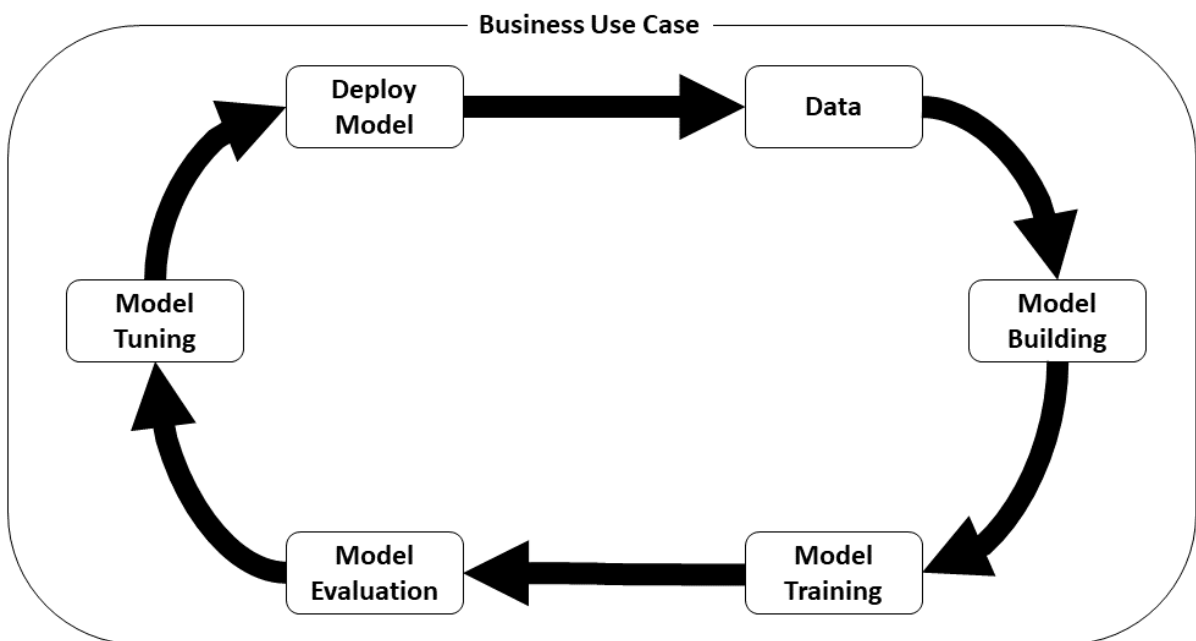
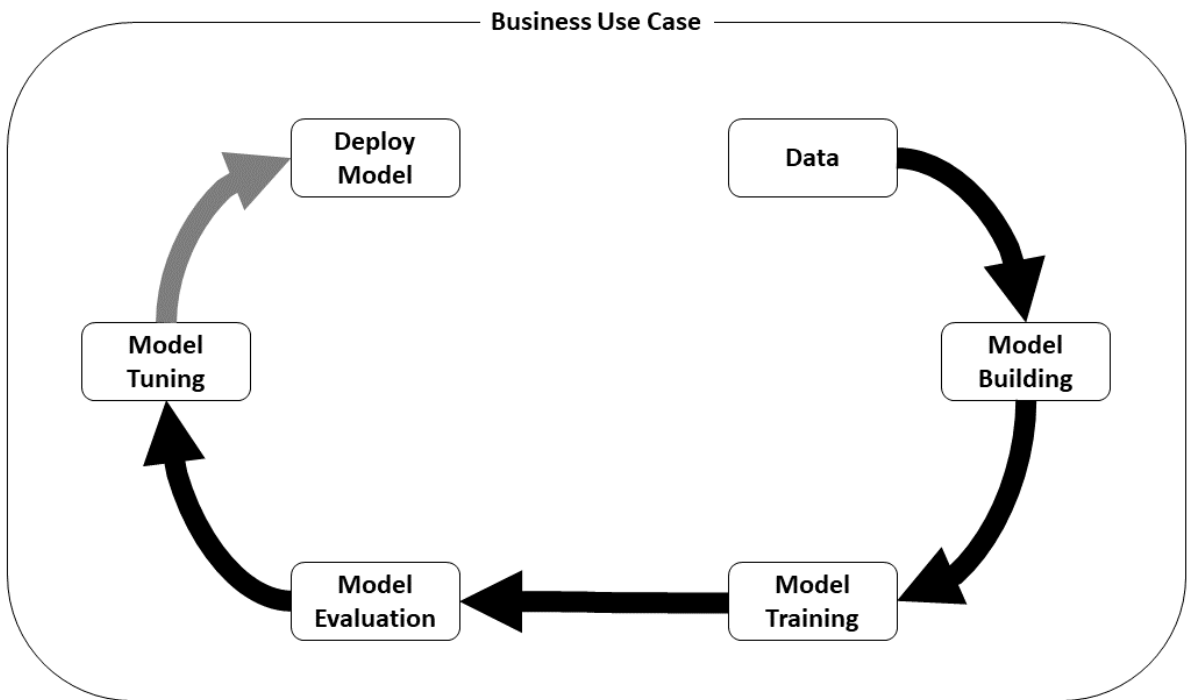




Layer (type)	Output Shape	Param #
dense_5 (Dense)	(None, 64)	704
dense_6 (Dense)	(None, 64)	4160
dense_7 (Dense)	(None, 1)	65
Total params: 4,929		
Trainable params: 4,929		
Non-trainable params: 0		







Chapter 2: Automating Machine Learning Model Development Using SageMaker Autopilot

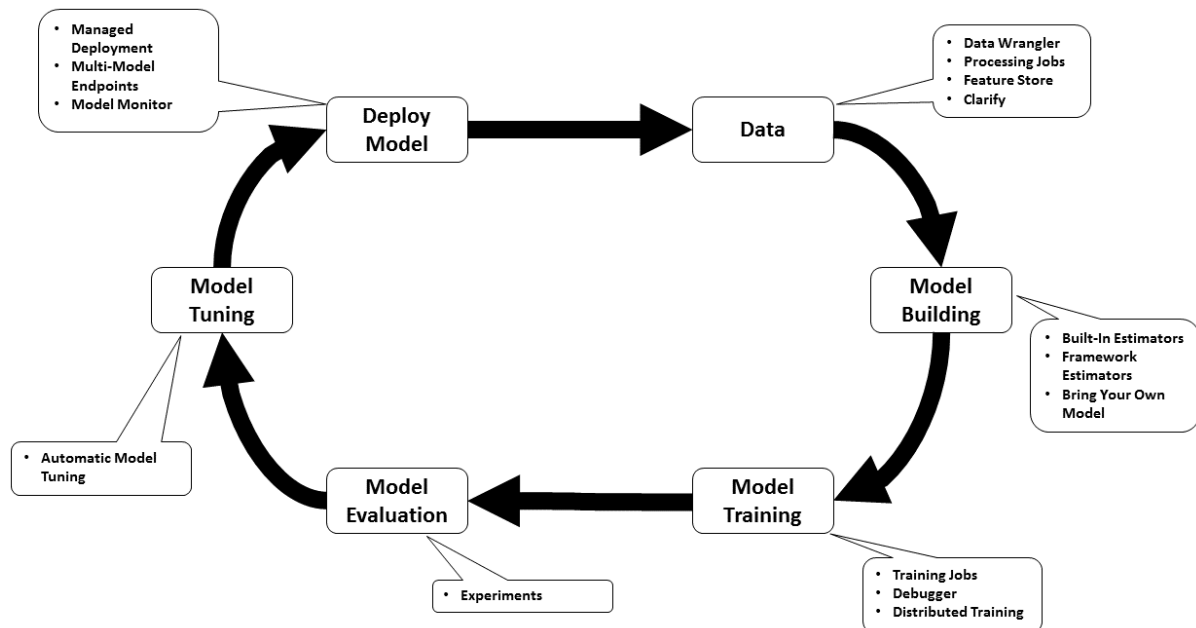
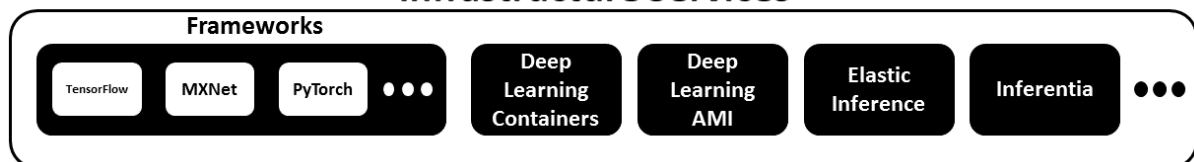
AI Services



ML Services



Infrastructure Services



Setup SageMaker Domain

Use SageMaker Domain as the central store to manage the configuration of SageMaker for your organization.

Quick setup

Let Amazon SageMaker configure your account, and set up permissions for your SageMaker Domain.

- ✓ Public internet access, and standard encryption
- ✓ SageMaker Studio Integration
- ✓ Sharable SageMaker Studio Notebooks
- ✓ IAM Authentication

Standard setup

Control all aspects of account configuration, including permissions, integrations, and encryption.

- ✓ Advanced network security, and data encryption
- ✓ SageMaker Studio, and RStudio integration
- ✓ SageMaker Studio Projects, and Jumpstart configurable
- ✓ IAM, or SSO authentication

User profile

Name

The name can have up to 63 characters. Valid characters: A-Z, a-z, 0-9, and - (hyphen)

Default execution role

SageMaker Domain requires permissions for its users to access other AWS services, such as Amazon SageMaker and Amazon S3. The execution role must have the [AmazonSageMakerFullAccess](#) policy attached. If you don't have a role with this policy attached, we can create one for you.

[Cancel](#)[Submit](#)

Create an IAM role



Passing an IAM role gives Amazon SageMaker permission to perform actions in other AWS services on your behalf. Creating a role here will grant permissions described by the [AmazonSageMakerFullAccess](#) IAM policy to the role you create.

The IAM role you create will provide access to:

✓ S3 buckets you specify - optional

☒ Any S3 bucket

Allow users that have access to your notebook instance access to any bucket and its contents in your account.

☐ Specific S3 buckets

Comma delimited. ARNs, "*" and "/" are not supported.

☐ None

✓ Any S3 bucket with "sagemaker" in the name

✓ Any S3 object with "sagemaker" in the name

✓ Any S3 object with the tag "sagemaker" and value "true"

[See Object tagging](#)

✓ S3 bucket with a Bucket Policy allowing access to SageMaker

[See S3 bucket policies](#)[Cancel](#)[Create role](#)

SageMaker Domain

Users

Add user

Q Search users

< 1 > ⚙

Name ▾	Modified on ▾	Created on ▾	
default-1640199221023	Dec 22, 2021 19:08 UTC	Dec 22, 2021 19:08 UTC	Launch app ▾

► Domain

How to delete the domain

Delete Domain

Edit Settings

sagemaker-studio-

Objects

Properties

Permissions

Metrics

Management

Access Points

Objects (0)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

↺

Copy S3 URI

Copy URL

Download

Open

Delete

Actions ▾

Create folder

Upload

Q Find objects by prefix

< 1 > ⚙

	Name ▲	Type ▾	Last modified ▾	Size ▾	Storage class ▾
No objects					
You don't have any objects in this bucket.					
Upload					

[Objects](#)[Properties](#)[Permissions](#)[Metrics](#)[Management](#)[Access Points](#)

Objects (0)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

  Copy S3 URI

 Copy URL

 Download

 Open

Delete

Actions ▼

Create folder

 Upload

< 1 > 

☐	Name ▲	Type ▼	Last modified ▼	Size ▼	Storage class ▼
--------------------------	--------	--------	-----------------	--------	-----------------

No objects

You don't have any objects in this bucket.

 Upload

Upload [Info](#)

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose **Add files**, or **Add folders**.

Files and folders (1 Total, 1.7 MB)

Remove

Add files

Add folder

All files and folders in this table will be uploaded.

Find by name

< 1 >

☐	Name ▲	Folder ▼	Type ▼	Size ▼
☐	abalone_with_headers.csv	-	application/vnd.ms-excel	1.7 MB

Destination

Destination

s3://sagemaker-studio-mps1qmpm6bs

► Destination details

Bucket settings that impact new objects stored in the specified destination.

► Permissions

Grant public access and access to other AWS accounts.

► Properties

Specify storage class, encryption settings, tags, and more.

Cancel

Upload

FileEditViewRunKernelGitTabsSettingsHelp

+

/

Name	Last Modified
------	---------------



SageMaker resources

Select the resource to view.

Experiments and trials

EXPERIMENTS

Create Autopilot Experiment

0 rows selected 0/20 filters

 Search column name to start

AUTOPILOT EXPERIMENT SETTINGS

Experiment name 

abalone-v0|

CONNECT YOUR DATA ⓘ

[S3 documentation](#) ↗

☒ Find S3 bucket ☐ Enter S3 bucket location

S3 bucket name ⓘ

sagemaker-studio-██████████ ▼

Dataset file name ⓘ

abalone_with_headers.csv ▼

Target ⓘ

rings ▼

Output data location (S3 bucket) ⓘ

☒ Find S3 bucket ☐ Enter S3 bucket location

S3 bucket name ⓘ

sagemaker-studio-██████████ ▼

Dataset directory name ⓘ

output ▼

Select the machine learning problem type ⓘ

Auto ▼

Auto deploy ⓘ

Off ☒ On

EXPERIMENT: ABALONE-V0



- Pre-processing
- Candidate Definitions Generated
- Feature Engineering
- Model Tuning
- Explainability Report Generated

A default experiment will generate 250 models and can take hours to complete. Check back later to see your experiment results.

If experiment is taking too long to run, you can [stop the experiment](#)

Trials

Job profile

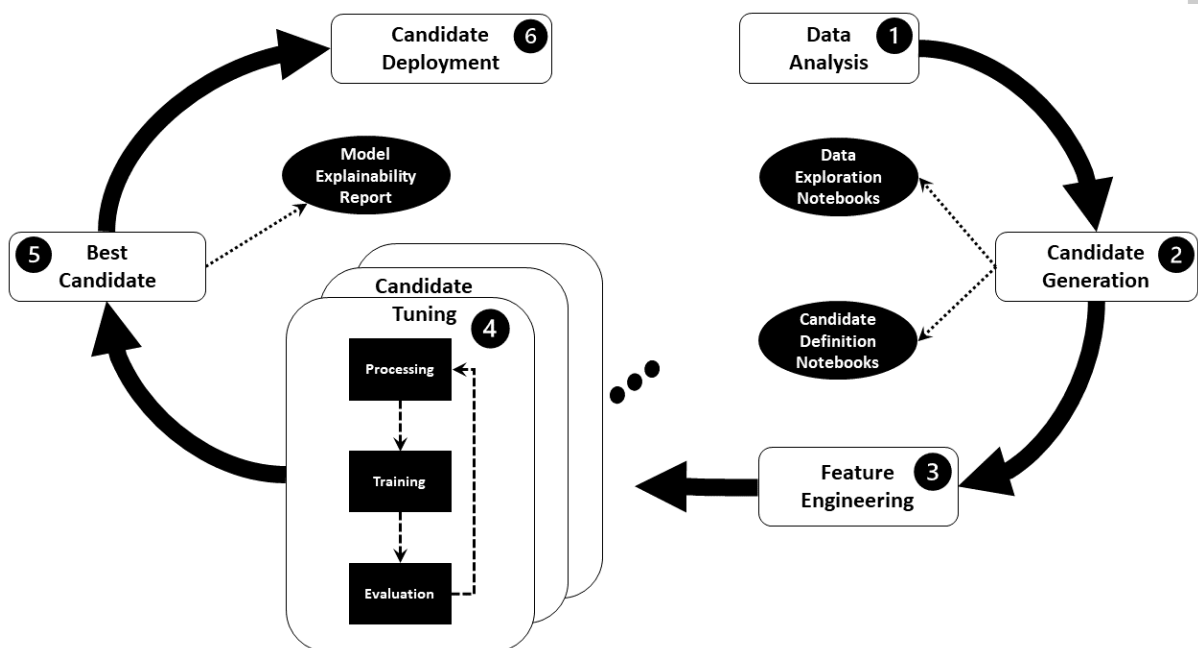
Your trials will display here as they are generated.

[Open candidate generation notebook](#)
[Open data exploration notebook](#)

[Trials](#) [Job profile](#)

Deploy model

Trial name	Status	Start time	Objective: Accuracy
★ Best: abalone-v0Jyb0ohoyE47jpFXk...	Completed	20 minutes ago	0.2917381823062897
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	18 minutes ago	0.29144808650016785
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	17 minutes ago	0.2893601655960083
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	25 minutes ago	0.28934869170188904
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	37 minutes ago	0.2887481153011322
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	40 minutes ago	0.28815001249313354
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	29 minutes ago	0.2869545519351959
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	20 minutes ago	0.28665801882743835
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	20 minutes ago	0.2866548001766205
abalone-v0Jyb0ohoyE47jpFXkM6ZXRK-...	Completed	1 hour ago	0.2866462171077728



Endpoint name ⓘ

Abalone-Endpoint-v0

Instance type ⓘ

ml.m5.xlarge ▼

Instance count ⓘ

1 ↕

Data capture ⓘ

☒ Save prediction requests

☒ Save prediction responses

Endpoint data location (S3 bucket) ⓘ

☒ Find S3 bucket ☐ Enter S3 bucket location

S3 bucket name ⓘ

sagemaker-studio-mps1qmpm6bs us-west-2 ▼

Dataset directory name ⓘ

Data-Capture ▼

Sampling percentage ⓘ

100 ▼

Inference Response Content ⓘ

▼

predicted_label ✕

Select Kernel

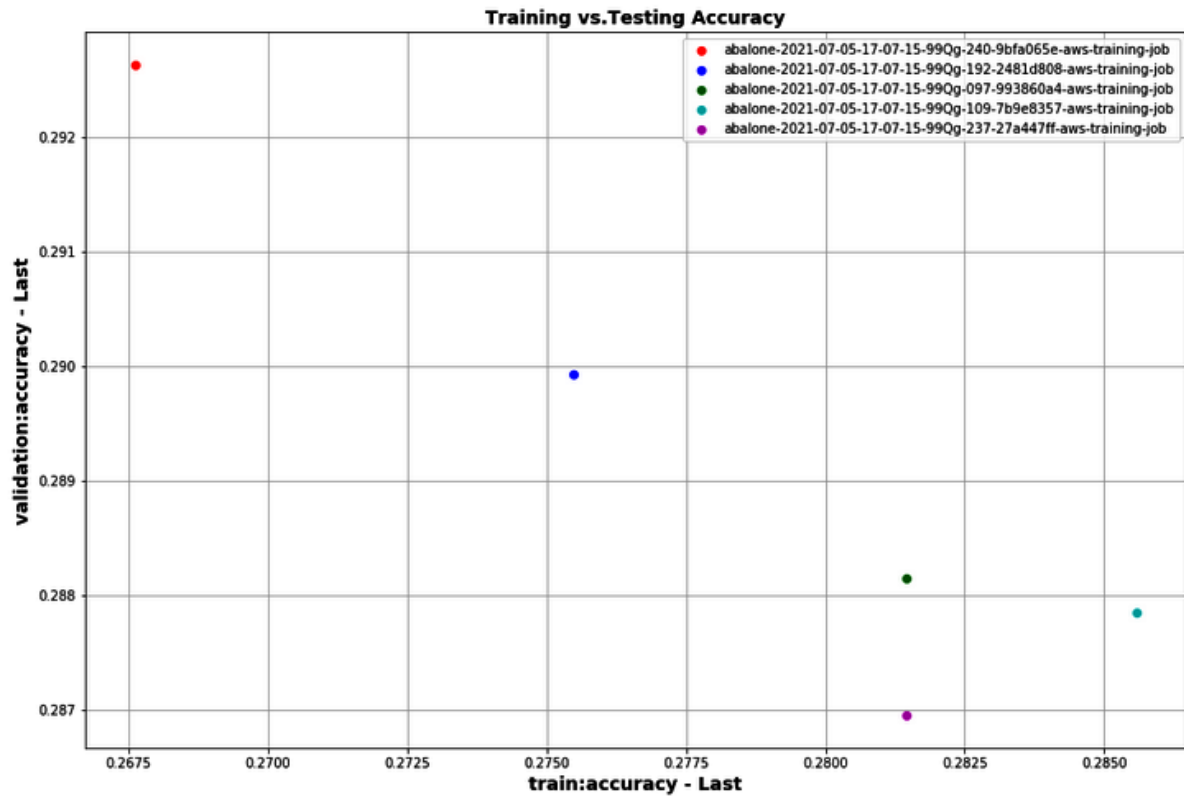
Select kernel for: "Untitled.ipynb"

Python 3 (Data Science) ▼

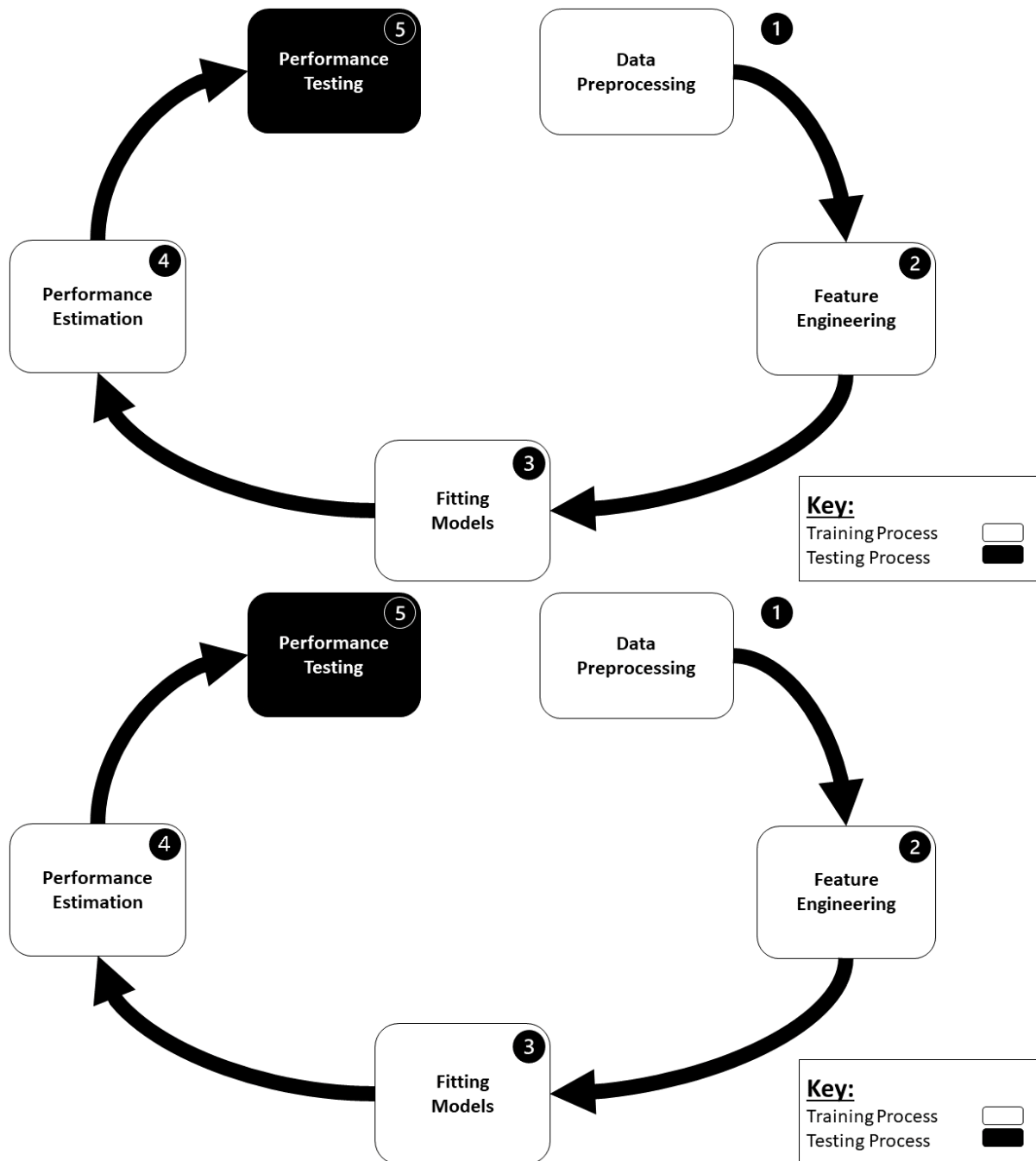
Cancel

Select

	TrialComponentName	validation:accuracy - Last	train:accuracy - Last
5	abalone-2021-07-05-17-07-15-99Qg-240-9bfa065e-...	0.292639	0.267620
58	abalone-2021-07-05-17-07-15-99Qg-192-2481d808-...	0.289939	0.275474
155	abalone-2021-07-05-17-07-15-99Qg-097-993860a4-...	0.288151	0.281461
142	abalone-2021-07-05-17-07-15-99Qg-109-7b9e8357-...	0.287852	0.285575
16	abalone-2021-07-05-17-07-15-99Qg-237-27a447ff-...	0.286952	0.281460

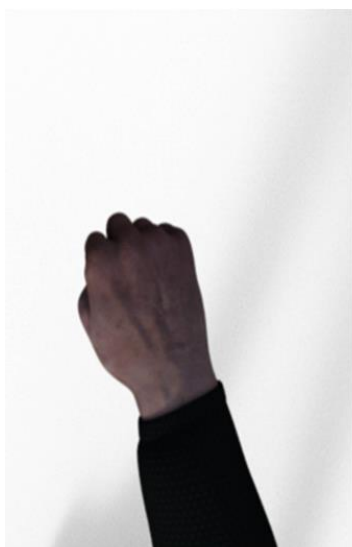
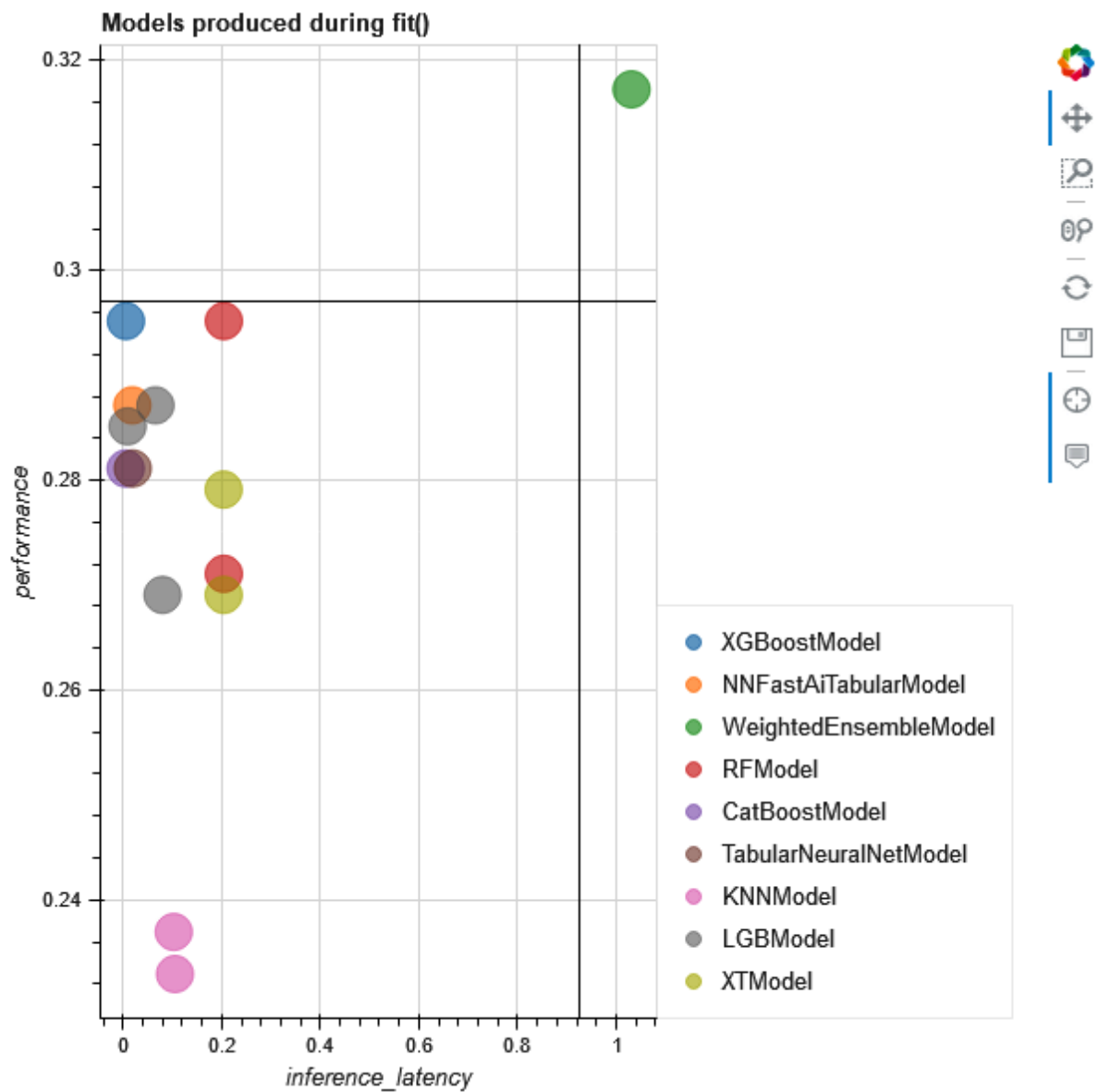


Chapter 3: Automating Complicated Model Development with AutoGluon



```
.
├── Fit_Summary.txt
├── Leaderboard.csv
├── learner.pkl
├── Model_Evaluation.txt
├── models
│   ├── CatBoost
│   │   └── model.pkl
│   ├── ExtraTreesEntr
│   │   └── model.pkl
│   ├── ExtraTreesGini
│   │   └── model.pkl
│   ├── KNeighborsDist
│   │   └── model.pkl
│   ├── KNeighborsUnif
│   │   └── model.pkl
│   ├── LightGBM
│   │   └── model.pkl
│   ├── LightGBMLarge
│   │   └── model.pkl
│   ├── LightGBMXT
│   │   └── model.pkl
│   ├── NeuralNetFastAI
│   │   ├── model-internals.pkl
│   │   └── model.pkl
│   ├── NeuralNetMXNet
│   │   ├── model.pkl
│   │   └── net.params
│   ├── RandomForestEntr
│   │   └── model.pkl
│   ├── RandomForestGini
│   │   └── model.pkl
│   ├── trainer.pkl
│   ├── WeightedEnsemble_L2
│   │   ├── model.pkl
│   │   └── utils
│   │       ├── model_template.pkl
│   │       └── oof.pkl
│   └── XGBoost
│       └── model.pkl
├── predictor.pkl
├── SummaryOfModels.html
├── utils
│   └── data
│       ├── X.pkl
│       ├── X_val.pkl
│       ├── y.pkl
│       └── y_val.pkl
```

	model	score_test	score_val
0	WeightedEnsemble_L2	0.229665	0.307229
1	XGBoost	0.229665	0.303213
2	LightGBM	0.248804	0.289157
3	NeuralNetMXNet	0.296651	0.275100
4	NeuralNetFastAI	0.284689	0.273092
5	LightGBMLarge	0.253589	0.271084
6	LightGBMXT	0.267943	0.267068
7	RandomForestEntr	0.265550	0.263052
8	CatBoost	0.263158	0.257028
9	RandomForestGini	0.251196	0.255020
10	ExtraTreesGini	0.263158	0.251004
11	ExtraTreesEntr	0.260766	0.240964
12	KNeighborsUnif	0.217703	0.220884
13	KNeighborsDist	0.200957	0.218876



Rock



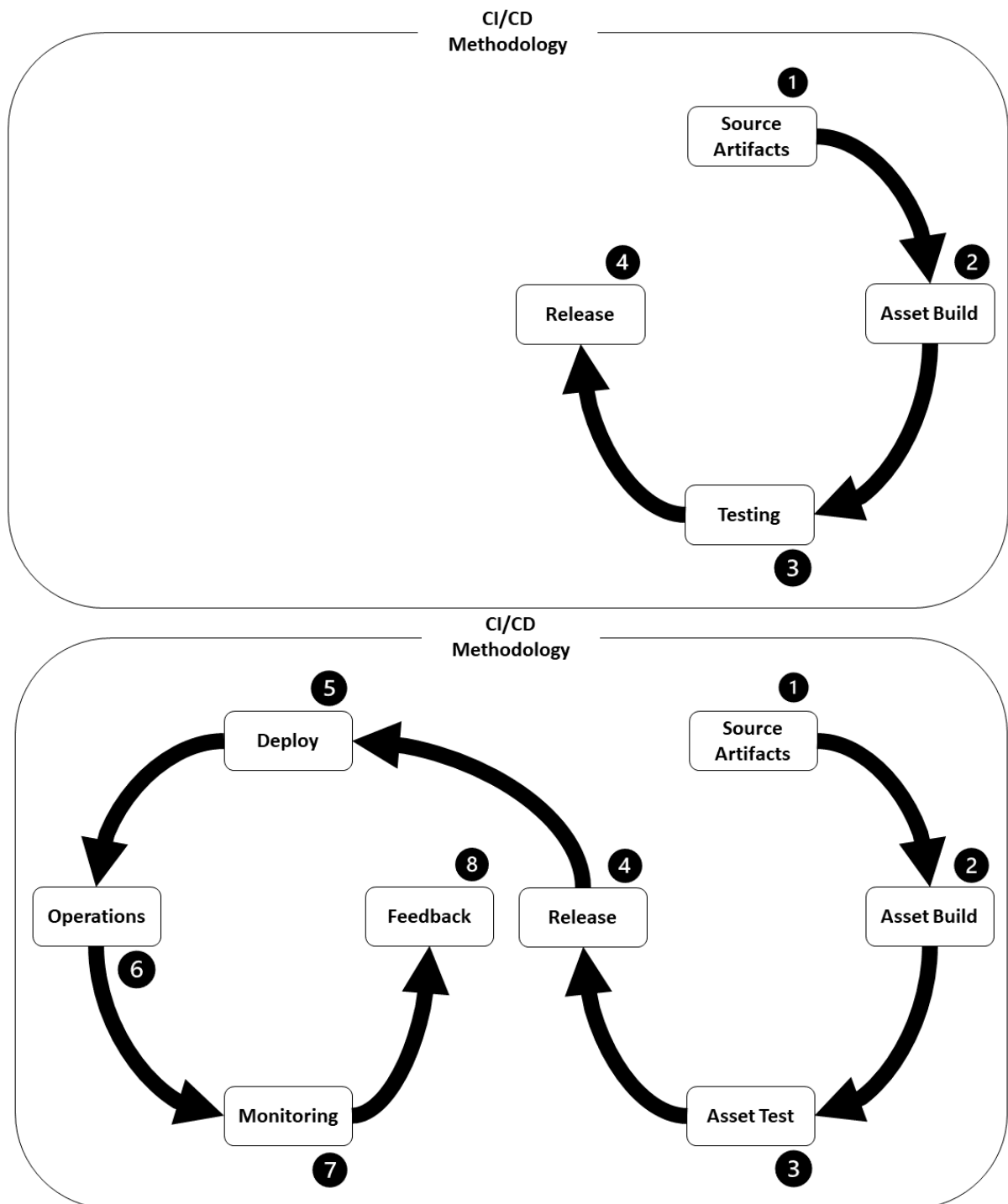
Paper

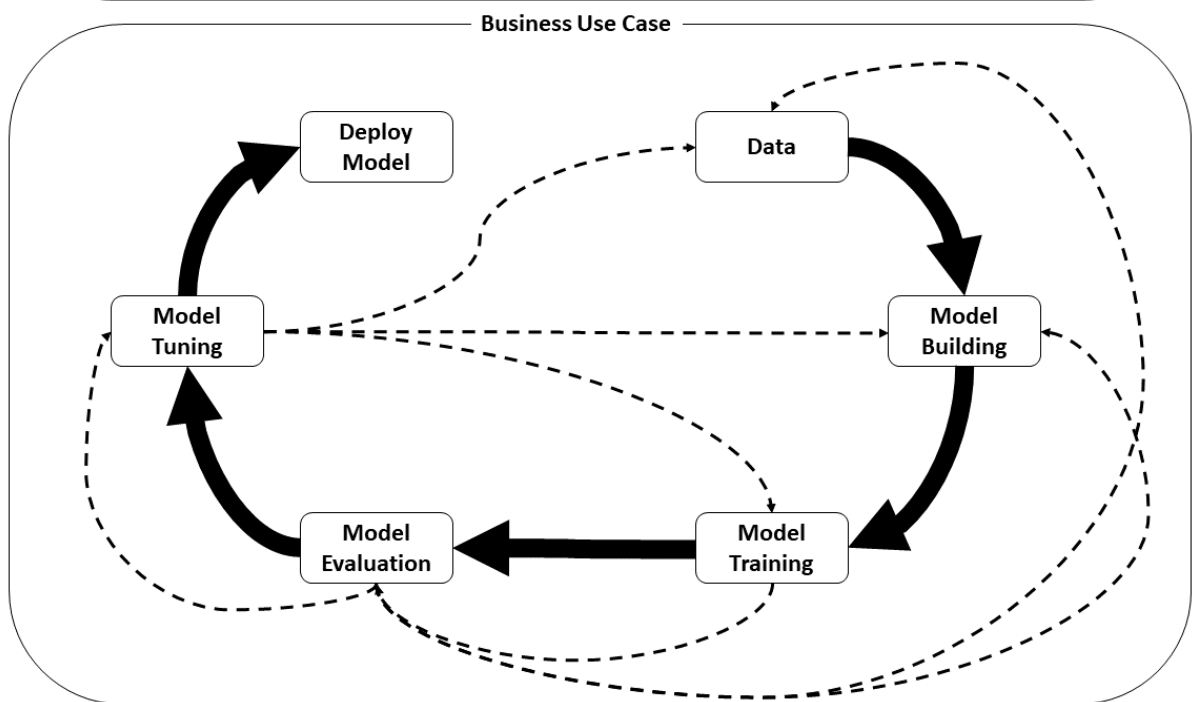
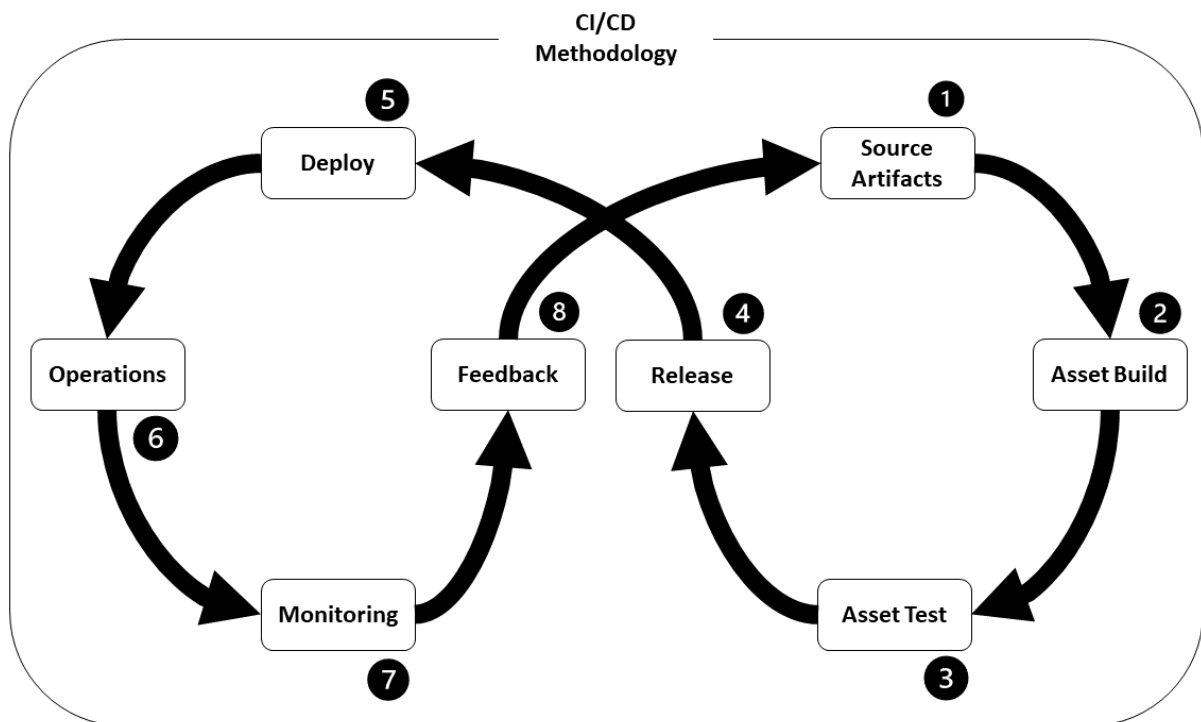


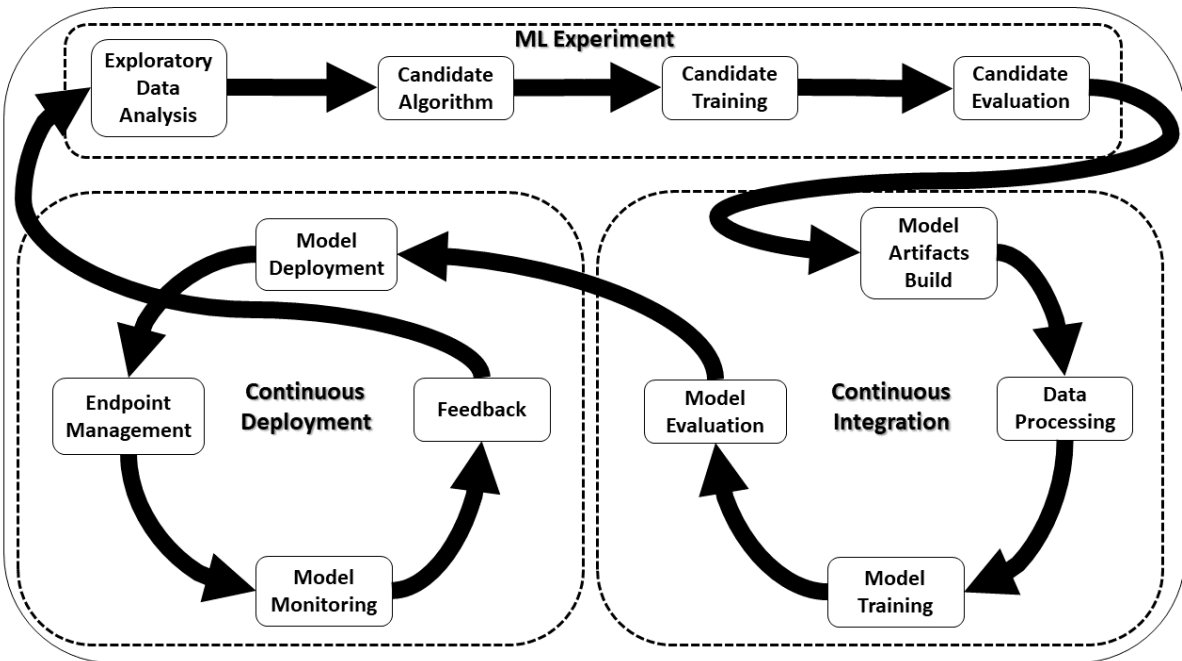
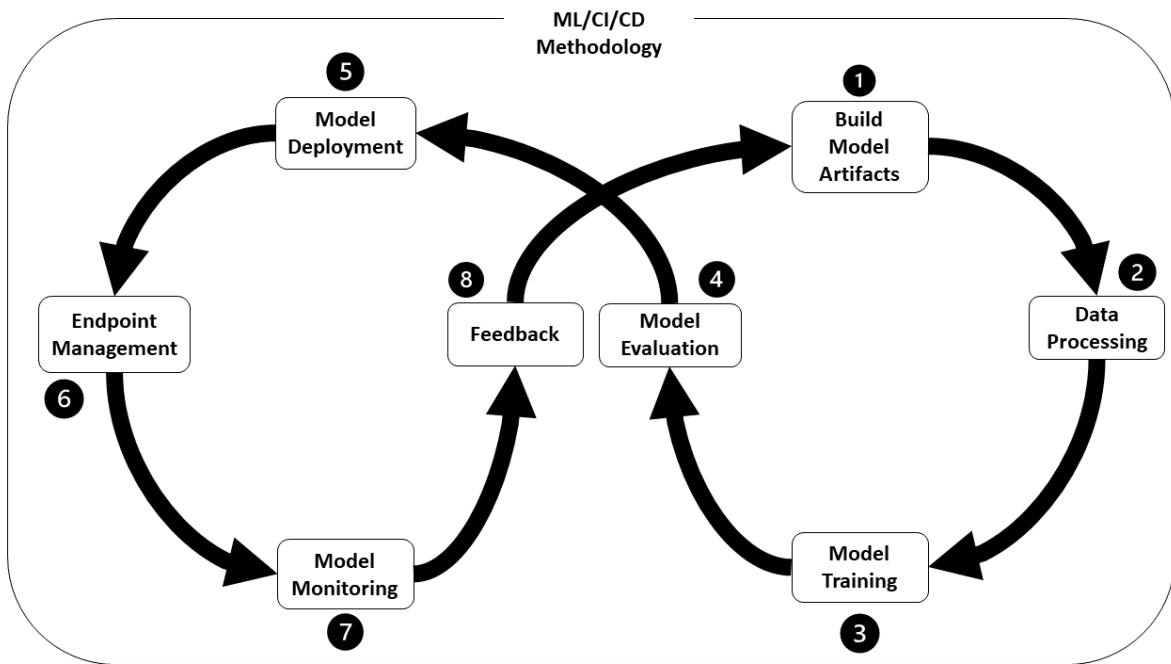
Scissors

	train_acc	valid_acc	total_time	best_config	fit_history
0	0.895536	1.0	609.59871	{'model': 'resnet50_v1b', 'use_pretrained': True, 'use_gn': False, 'batch_norm': False, 'use_se': False, 'last_gamma': False}	NaN
1	0.895536	1.0	609.59871	{'pretrained_base': True, 'batch_size': 64, 'epochs': 50, 'lr': 0.01, 'lr_decay': 0.1, 'lr_decay_period': 0, 'lr_decay_epoch': '40, 60', 'lr_mode': 'step', 'warmup_lr': 0.0, 'warmup_epochs': 0, 'num_training_samples': -1, 'num_workers': 4, 'wd': 0.0001, 'momentum': 0.9, 'teacher': None, 'hard_weight': 0.5, 'dtype': 'float32', 'input_size': 224, 'crop_ratio': 0.875, 'use_rec': False, 'rec_train': 'auto', 'rec_train_idx': 'auto', 'rec_val': 'auto', 'rec_val_idx': 'auto', 'data_dir': 'auto', 'mixup': False, 'no_wd': False, 'label_smoothing': False, 'temperature': 20, 'resume_epoch': 0, 'mixup_alpha': 0.2, 'mixup_off_epoch': 0, 'log_interval': 50, 'mode': '', 'start_epoch': 0, 'transfer_lr_mult': 0.01, 'output_lr_mult': 0.1, 'early_stop_patience': 5, 'early_stop_min_delta': 0.001, 'early_stop_baseline': -inf, 'early_stop_max_value': inf}	NaN
2	0.895536	1.0	609.59871	{'batch_size': 64, 'num_workers': 4}	NaN
3	0.895536	1.0	609.59871	[0]	NaN
4	0.895536	1.0	609.59871	< class 'gluoncv.auto.estimators.image_classification.image_classification.ImageClassificationEstimator'>	NaN
5	0.895536	1.0	609.59871	NaN	1.0
6	0.895536	1.0	609.59871	NaN	{}
7	0.895536	1.0	609.59871	NaN	609.5987095832825
8	0.895536	1.0	609.59871	NaN	OrderedDict([(0, {})])
9	0.895536	1.0	609.59871	NaN	acc_reward

Chapter 4: Continuous Integration and Continuous Delivery (CI/CD) for Machine Learning







Name environment

Environment name and description

Name

The name needs to be unique per user. You can update it at any time in your environment settings.

Limit: 60 characters

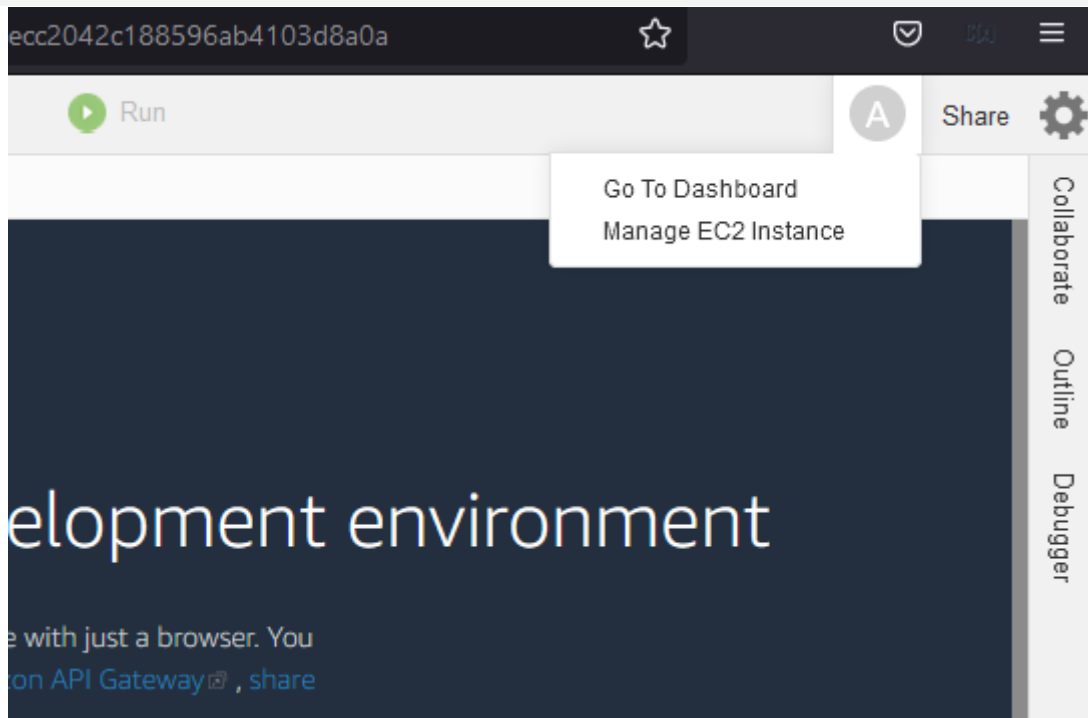
Description - *Optional*

This will appear on your environment's card in your dashboard. You can update it at any time in your environment settings.

Limit: 200 characters

Cancel

Next step



Instances (1/1) Info

Refresh

Connect

Instance state

Actions

Launch instances

Filter instances

search: aws-cloud9-MLOps-IDE-aeb1feedf69d44b99c819614060c9930

Clear

☒	Name	Instance ID	Instance state	Instance type
☒	aws-cloud9-M...	i-Of525ce3d00805a52	Running	t2.micro

Change security groups

Get Windows password

Modify IAM role

Connect

View details

Manage instance state

Instance settings

Networking

Security

Image and templates

Monitor and troubleshoot

Alarm status

No alarms

Modify IAM role Info

Attach an IAM role to your instance.

Instance ID

aws-cloud9-MLOps-IDE-aeb1feedf69d44b99c819614060c9930

IAM role

Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

Choose IAM role

Refresh

Create new IAM role

If you choose No IAM Role, any IAM role that is currently attached to the instance will be removed. Are you sure you want to remove from the selected instance?

Cancel

Save

Create role

1 2 3 4

Select type of trusted entity

 **AWS service**
EC2, Lambda and others



Another AWS account
Belonging to you or 3rd party



Web identity
Cognito or any OpenID provider



SAML 2.0 federation
Your corporate directory

Allows AWS services to perform actions on your behalf. [Learn more](#)

Choose a use case

Common use cases

EC2

Allows EC2 instances to call AWS services on your behalf.

Lambda

Allows Lambda functions to call AWS services on your behalf.

Filter policies

Q administrator

Showing 14 results

	Policy name	Used as
☒	 AdministratorAccess	Permissions policy (4)
☐	 AdministratorAccess-Amplify	None
☐	 AdministratorAccess-AWSElasticBeanstalk	None
☐	 AmazonAPIGatewayAdministrator	None
☐	 AWSAppSyncAdministrator	None
☐	 AWSAuditManagerAdministratorAccess	None
☐	 AWSCloud9Administrator	None
☐	 AWSGrafanaAccountAdministrator	None

Review

Provide the required information below and review this role before you create it.

Role name*

Cloud9-AdminRole

Use alphanumeric and '+=, @-_' characters. Maximum 64 characters.

Role description

Allows EC2 instances to call AWS services on your behalf.

Maximum 1000 characters. Use alphanumeric and '+=, @-_' characters.

Trusted entities

AWS service: ec2.amazonaws.com

Policies



AdministratorAccess



Permissions boundary

Permissions boundary is not set

Modify IAM role [Info](#)

Attach an IAM role to your instance.

Instance ID

 [REDACTED] (aws-cloud9-MLOps-IDE[REDACTED])

IAM role

Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

Cloud9-AdminRole ▼



[Create new IAM role](#) 

Cancel

Save



Welcome ×

Preferences × 

▶ PROJECT SETTINGS

▶ USER SETTINGS

▼ AWS SETTINGS

AWS

AWS Resources

Credentials

▶ KEYBINDINGS

▶ THEMES

▶ EXPERIMENTAL



AWS Settings

These settings change how AWS Cloud9 interacts with other Amazon Services and how the AWS Resources panel operates

AWS Resources

AWS Toolkit 



Credentials

AWS managed temporary credentials:



Chapter 5: Continuous Deployment of a Production ML Model

Pipelines [Info](#)

Notify

View history

Release change

Delete pipeline

Create pipeline

< 1 >

	Name	Most recent execution	Latest source revisions	Last executed
	abalone-cicd-pipeline	Failed	MainSource – ef28165d : Initial commit of Pipeline Artifacts	5 minutes ago

Source

Failed

Retry

Pipeline execution ID: [af2a5bdf-b1fe-4e94-8eaa-b2da1cd8d00d](#)

MainSource

[AWS CodeCommit](#)

Succeeded - 1 day ago

[7347332d](#)

ModelSource

[AWS CodeCommit](#)

Failed - 1 day ago

[Details](#)

[7347332d](#) MainSource: Inital commit of Pipeline Artifacts

Source

Succeeded

Pipeline execution ID: [4426eb96-9937-4d54-b480-dfad41571ae2](#)

MainSource

[AWS CodeCommit](#)

Succeeded - 2 minutes ago

[7347332d](#)

ModelSource

[AWS CodeCommit](#)

Succeeded - 2 minutes ago

[443ac5dd](#)

[443ac5dd](#) ModelSource: Initial commit of model artifacts

[7347332d](#) MainSource: Inital commit of Pipeline Artifacts

✓ **Build** Succeeded

Pipeline execution ID: [Sedeb509-19a3-4576-ba4f-18cf1ec1a7b9](#)

ContainerBuild



[AWS CodeBuild](#)

✓ Succeeded - 26 minutes ago

[Details](#)



Preprocess



[AWS CodeBuild](#)

✓ Succeeded - 21 minutes ago

[Details](#)



Train



[AWS CodeBuild](#)

✓ Succeeded - 11 minutes ago

[Details](#)



Evaluate



[AWS CodeBuild](#)

✓ Succeeded - 4 minutes ago

[Details](#)

[dbb2a718](#) ModelSource: Initial commit of model artifacts:

[0b5645fd](#) MainSource: Checkpoint



```
94
95 [Container] 2021/11/24 15:27:09 Running command python ./artifacts/scripts/build.py train
96 INFO: [build.py:251] Executing TRAIN task
97 INFO: [build.py:243] Task: train, Status: InProgress
98 INFO: [build.py:243] Task: train, Status: InProgress
99 INFO: [build.py:243] Task: train, Status: InProgress
100 INFO: [build.py:243] Task: train, Status: InProgress
101 INFO: [build.py:243] Task: train, Status: InProgress
102 INFO: [build.py:243] Task: train, Status: InProgress
103 INFO: [build.py:243] Task: train, Status: InProgress
104 INFO: [build.py:243] Task: train, Status: InProgress
105 INFO: [build.py:266] Task: train, Final Status: Completed
106
```

Approval Pending

Pipeline execution ID: [4426eb96-9937-4d54-b480-dfad41571ae2](#)

EvaluationApproval

Manual approval

 Waiting for approval -

Review

[443ac5dd](#) ModelSource: Initial commit of model artifacts

[7347332d](#) MainSource: Initial commit of Pipeline Artifacts

Review



Comments about this action

Is the Model Ready for Production?

URL for review

-

Comments - *optional*



Preview markdown

[Learn more](#)

Model approved for production.

Cancel

Reject

Approve

✓ **Deploy** Succeeded

Pipeline execution ID: [342cda3f-e617-4cd7-861f-62b001de58fd](#)

DeploymentBuild



[AWS CodeBuild](#)

✓ **Succeeded** - 25 minutes ago

[Details](#)



DeployEndpoint



[AWS CloudFormation](#) 

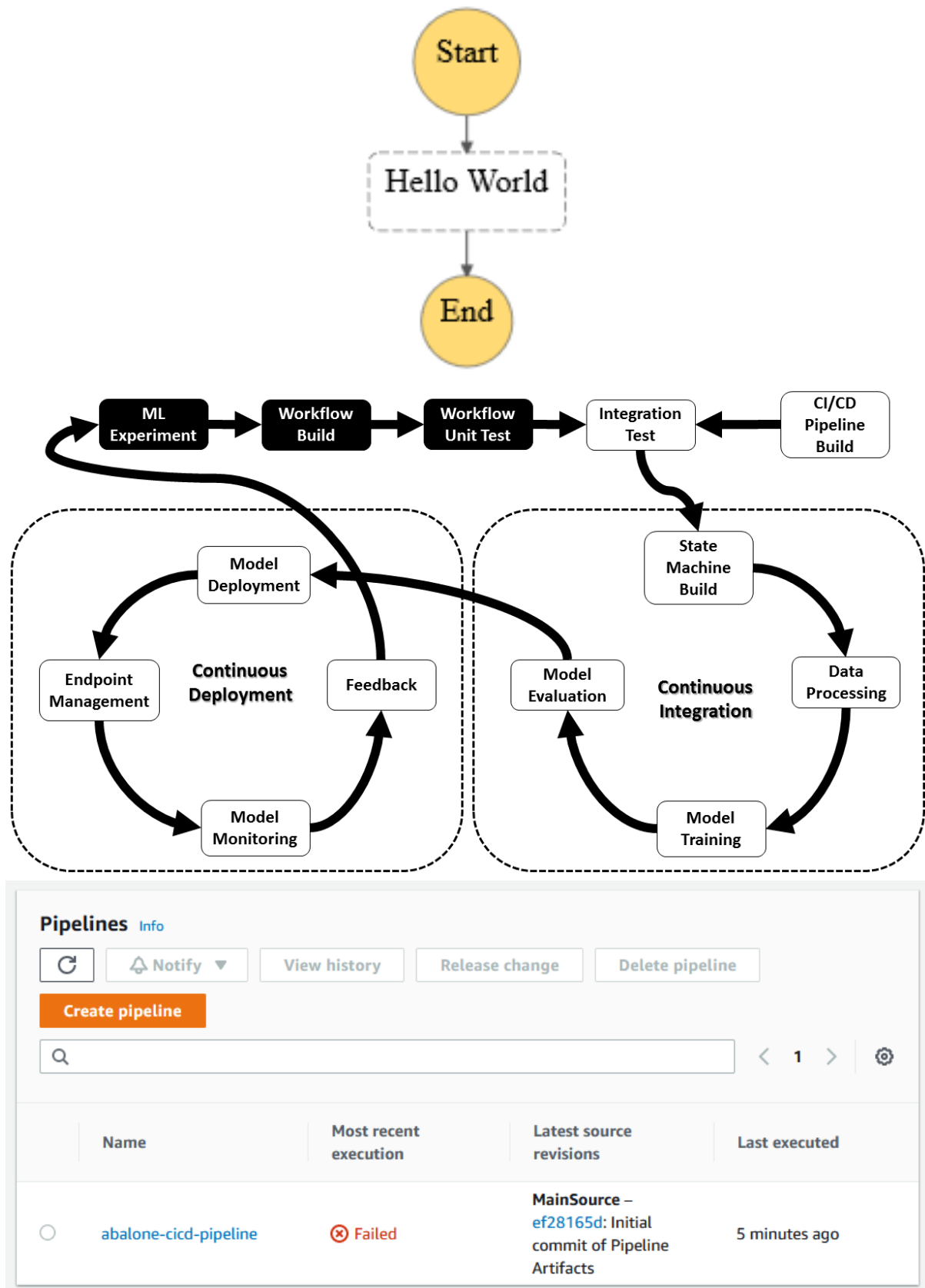
✓ **Succeeded** - 18 minutes ago

[Details](#) 

[443ac5dd](#) ModelSource: Initial commit of model artifacts

[7347332d](#) MainSource: Initial commit of Pipeline Artifacts

Chapter 6: Automating the Machine Learning Process Using AWS Step Functions



Chapter 7: Building the ML Workflow Using AWS Step Functions



FileEditViewRunKernelGitTabsSettingsHelp



You are not currently in a Git repository. To use Git, navigate to a local repository, initialize a repository here, or clone an existing repository.



Open the FileBrowser

Initialize a Repository

Clone a Repository



FileEditViewRunKernelGitTabsSettingsHelp



Current Repository

abalone-cicd-pipeline



Current Branch

main



Filter

New Branch



main

origin/HEAD

origin/main



Changes

History



Staged

Changed

Untracked



(0)

(0)

(0)

Create a Branch

×

Name

model

Create branch based on...

Filter

main

 The current branch. Pick this if you want to build on work done in this branch.

origin/HEAD



origin/main



Cancel

Create Branch

FileEditViewRunKernelGitTabsSettingsHelp

Current Repository

abalone-cicd-pipeline

Current Branch

model

Changes

History

▼ Staged (24)

__init__.py

abalone_cicd_pipeline

D

abalone_cicd_pipeline_stack.py

abalone_cicd_pipeline

D

abalone_endpoint_stack.py

abalone_cicd_pipeline

D

app.py

D

analyze_results.py

artifacts

A

analyze_results.zip

artifacts

A

abalone.data

artifacts/data

D

evaluate.py

artifacts

A

model_training.py

artifacts

A

preprocessing.py

artifacts

A

deploy.py

artifacts/scripts

D

cdk.json

D

Abalone Step Functions Workflow Example-checkpoint.ipynb

notebook/.ipynb_checkpoints

A

Untitled-checkpoint.ipynb

notebook/.ipynb_checkpoints

A

Abalone Step Functions Workflow Example.ipynb

notebook

A

Untitled.ipynb

notebook

A

README.md

D

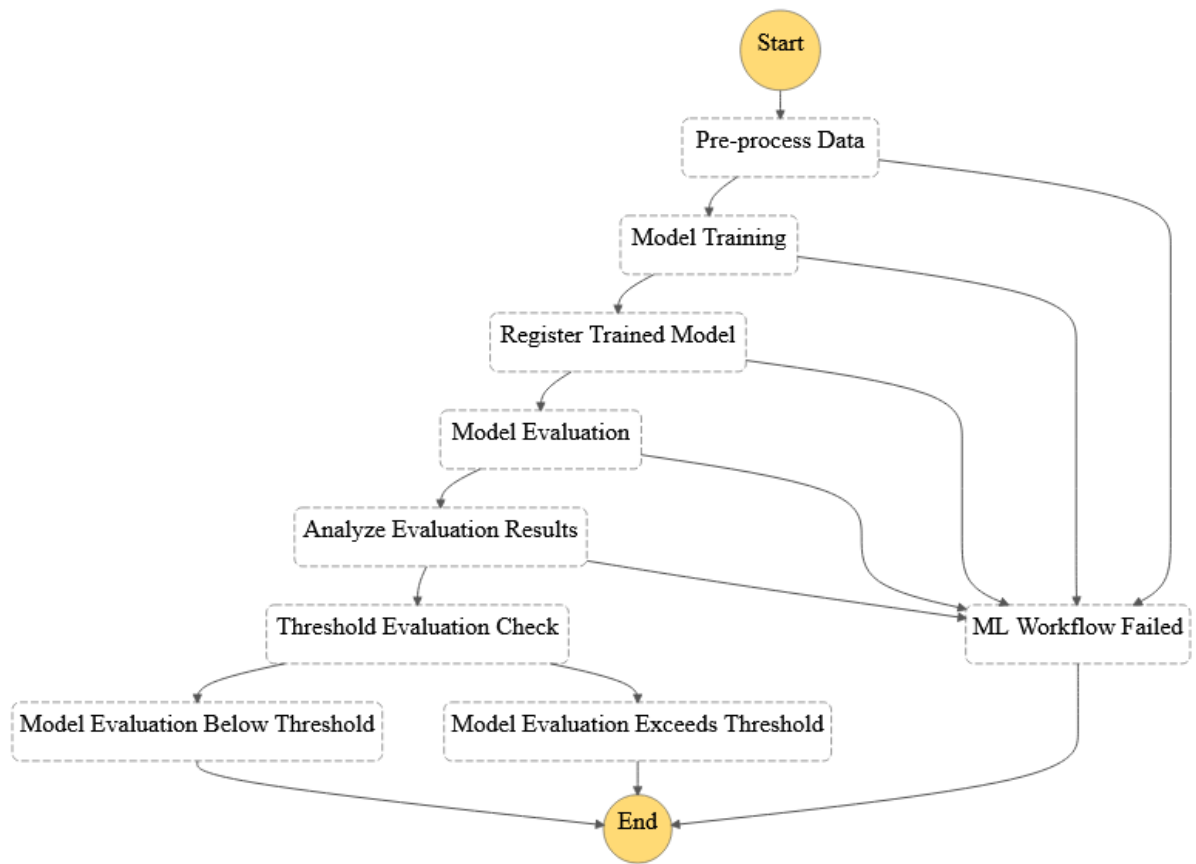
requirements-dev.txt

D

Initial commit of Workflow Artifacts

Description

Commit



✔ **Source** Succeeded

Pipeline execution ID: [828508aa-2c61-4caa-a596-ea37596129ac](#)

MainSource ⓘ

[AWS CodeCommit](#)

✔ Succeeded - 5 minutes ago
[cfe1451c](#)

ModelSource ⓘ

[AWS CodeCommit](#)

✔ Succeeded - 5 minutes ago
[d854de3d](#)

[cfe1451c](#) MainSource: Initial commit of Pipeline Artifacts

[d854de3d](#) ModelSource: Added Integration artifacts

↓
Disable transition

✔ **Build** Succeeded

Pipeline execution ID: [828508aa-2c61-4caa-a596-ea37596129ac](#)

BuildModel ⓘ

[AWS CodeBuild](#)

✔ Succeeded - 1 minute ago
[Details](#)

[cfe1451c](#) MainSource: Initial commit of Pipeline Artifacts

[d854de3d](#) ModelSource: Added Integration artifacts

↓
Disable transition

🕒 **Approval** Pending

Pipeline execution ID: [828508aa-2c61-4caa-a596-ea37596129ac](#)

EvaluationApproval ⓘ

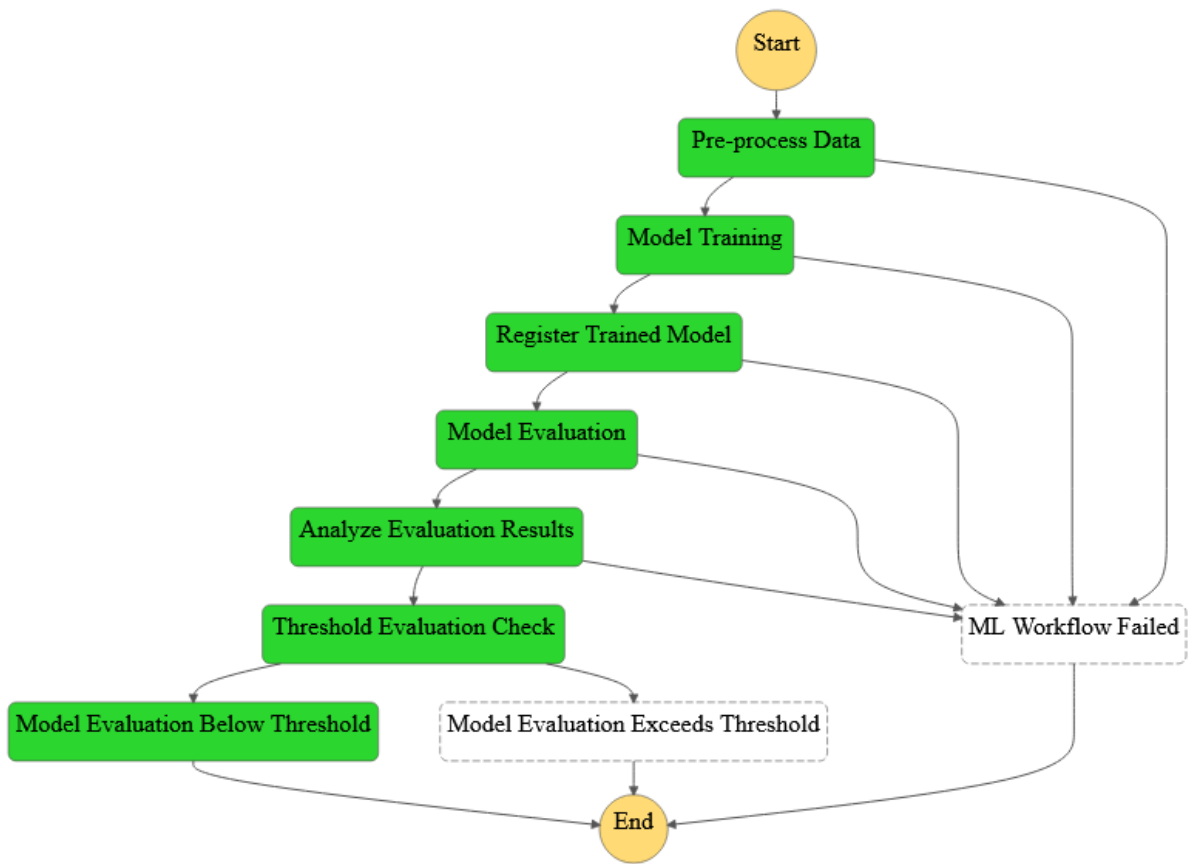
Manual approval

🕒 Waiting for approval -

[Review](#)

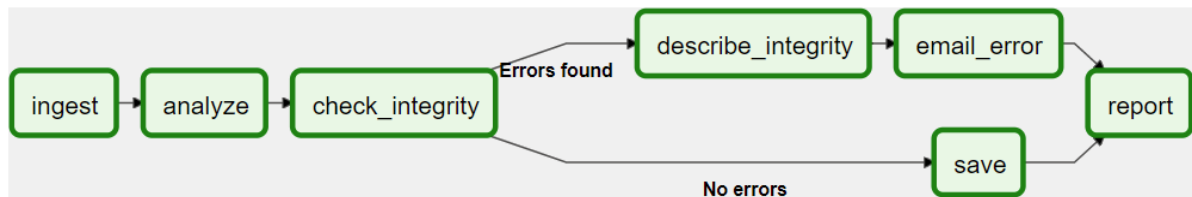
[cfe1451c](#) MainSource: Initial commit of Pipeline Artifacts

[d854de3d](#) ModelSource: Added Integration artifacts



Details	Step input	Step output
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	<pre data-bbox="304 353 1372 1326">{ "ExecutedVersion": "\$LATEST", "Payload": { "statusCode": 200, "Result": 1.5096032160120447 }, "SdkHttpMetadata": { "AllHttpHeaders": { "X-Amz-Executed-Version": ["\$LATEST"], "x-amzn-Remapped-Content-Length": ["0"], "Connection": ["keep-alive"], "x-amzn-RequestId": [</pre>	

Chapter 8: Automating the Machine Learning Process Using Apache Airflow



Choose DAG path in S3 ([redacted])

S3 Bucket > abalone-data-[redacted]

Folders (1/2)

Find object by prefix

	Key	Last modified	Size
☐	abalone_data	-	-
☒	airflow	-	-

Cancel Choose

Choose DAG path in S3 ([redacted])

S3 Bucket > abalone-data-[redacted] > airflow

Folders (1/3)

Find object by prefix

	Key	Last modified	Size
☒	dags	-	-
☐	scripts	-	-
☐	requirements.txt	Thu Sep 23 2021 12:48:29 GMT-0700 (Pacific Daylight Time)	43 Bytes

Cancel Choose

Choose requirements file in S3 ([redacted])

S3 Bucket > abalone-data-[redacted] > airflow

Objects (1/3)

Find object by prefix

	Key	Last modified	Size
☐	dags	-	-
☐	scripts	-	-
☒	requirements.txt	Thu Sep 23 2021 12:48:29 GMT-0700 (Pacific Daylight Time)	43 Bytes

Cancel Choose

Networking [Info](#)

Virtual private cloud (VPC)

Defines the networking infrastructure setup of your Airflow environment. An environment needs 2 private subnets in different availability zones. To create a new VPC with private subnets, choose Create MWA VPC. [Learn more](#)

vpc-0515d72b4a8448e6e
MWAA-VPC



Create MWA VPC

Subnet 1

Private subnet for the first availability zone. Each environment occupies 2 availability zones.

subnet-07eba59544e2d981c
Private



Subnet 2

Private subnet for the second availability zone. Each environment occupies 2 availability zones.

subnet-0f4827d2da1d415ae
Private



VPC and subnet selections can't be changed after an environment is created.

Permissions

Trust relationships

Tags

Access Advisor

Revoke sessions

Permissions policies (6 policies applied)

Attach policies

[+ Add inline policy](#)

Policy name	Policy type	
AmazonS3FullAccess	AWS managed policy	
AmazonSSMFullAccess	AWS managed policy	
AWSGlueConsoleFullAccess	AWS managed policy	
AmazonSageMakerFullAccess	AWS managed policy	
MWAA-Execution-Policy-	Managed policy	
AWSLambda_FullAccess	AWS managed policy	

Permissions boundary (not set)

Generate policy based on CloudTrail events

You can generate a new policy based on the access activity for this role, then customize, create, and attach it to this role. AWS uses your CloudTrail events to identify the services and actions used and generate a policy. [Learn more](#)

Share your [feedback](#) and help us improve the policy generation experience.

Generate policy

No requests to generate a policy in the past 7 days.

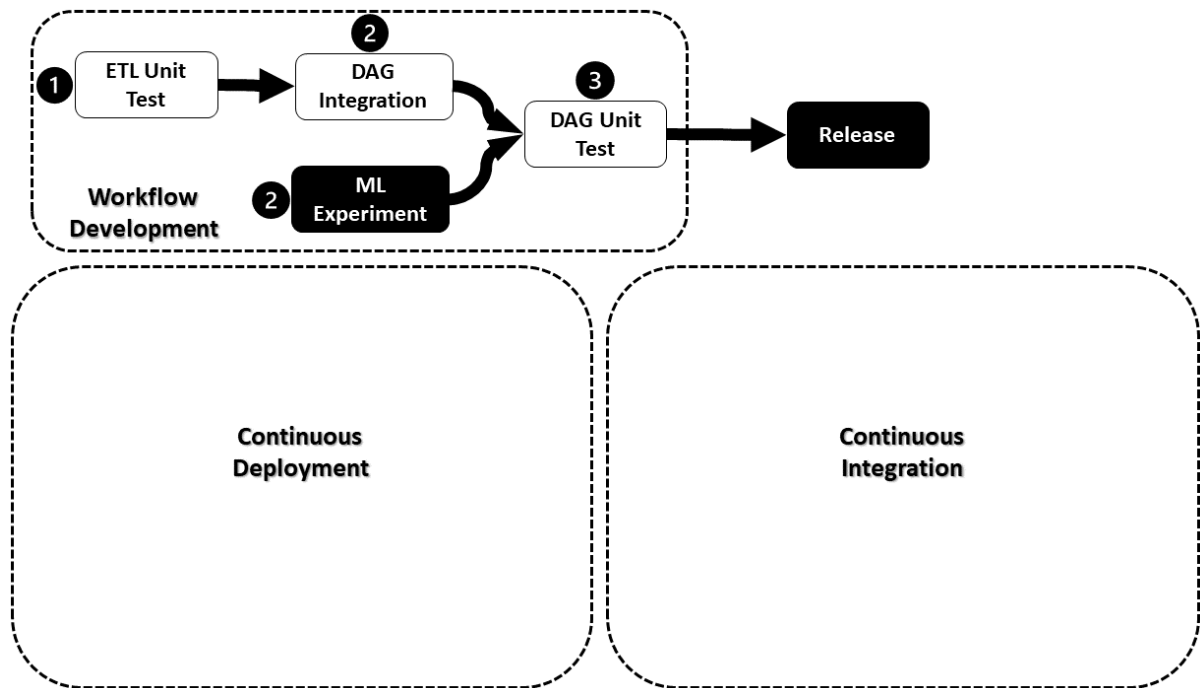
Airflow environments

**Next steps**
While you wait for your environment to be created, learn about how to access the Airflow UI and work with your DAGs.

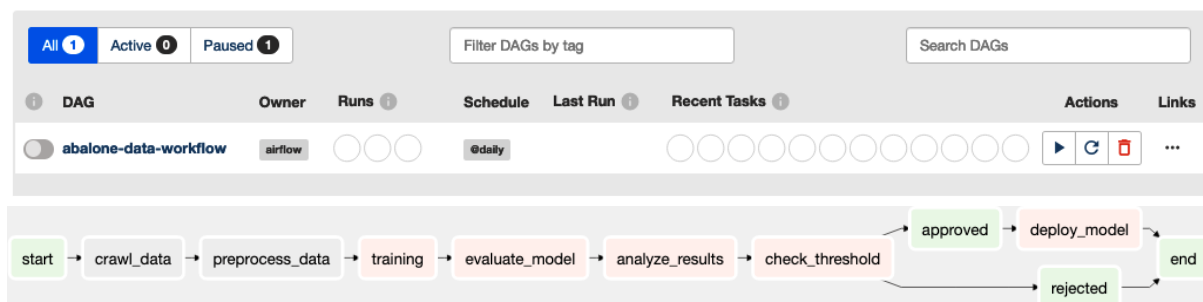
Learn more 

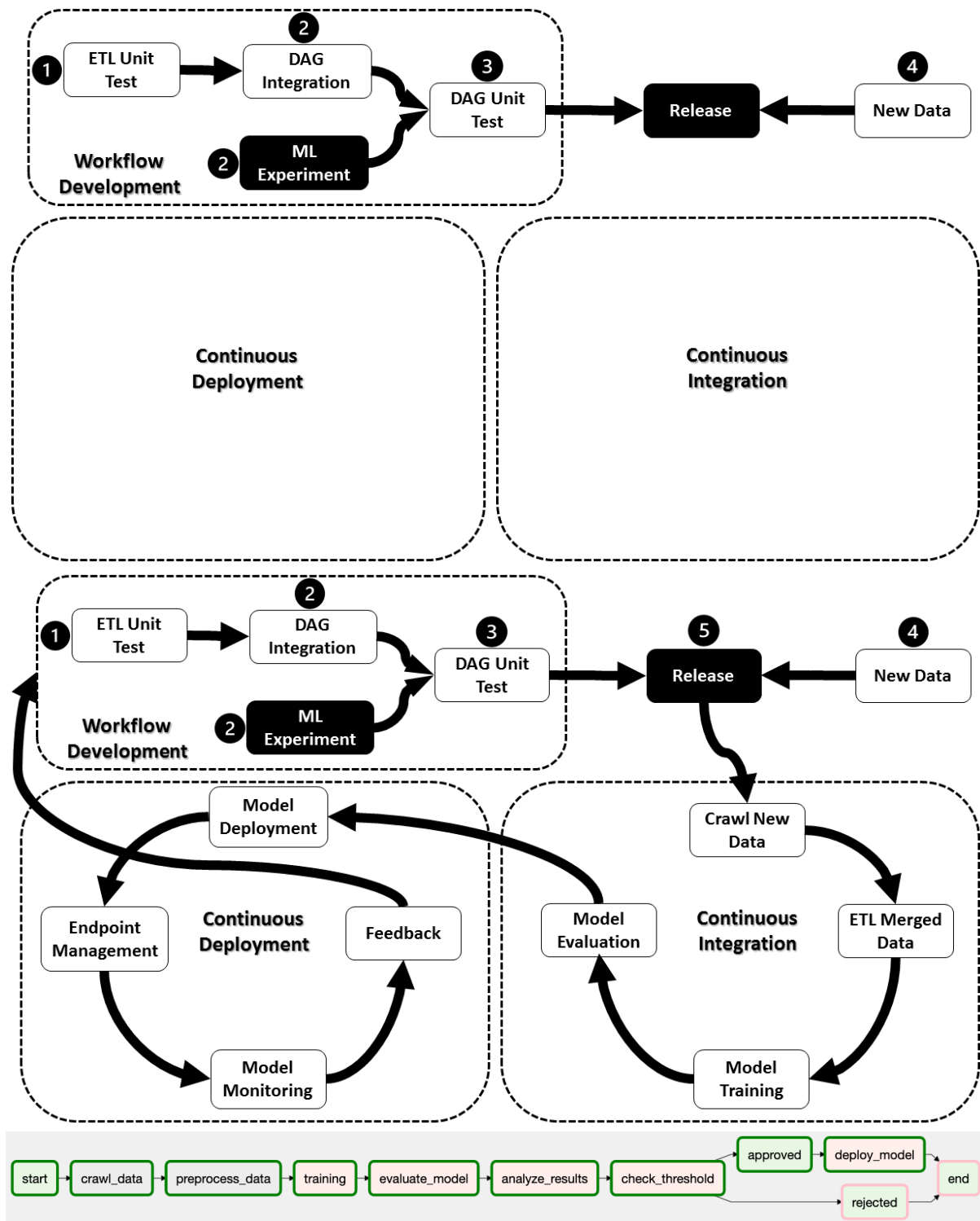
Environments (1)						Refresh	Edit	Delete	Actions	Create environment
Find environments						< 1 > 				
	Name	Status	Created date	Airflow version	Airflow UI					
☐	MyAirflowEnvironment	Available	Sep 23, 2021 14:20:03 (UTC-07:00)	2.0.2	Open Airflow UI					

Chapter 9: Building the ML Workflow Using Amazon Managed Workflows for Apache Airflow



DAGs





Task Instance: training

at: 2021-09-23T00:00:00+00:00

- Instance Details
- Rendered
- Log
- All Instances
- Filter Upstream

Download Log (by attempts):

1

Task Actions

Ignore All Deps

Ignore Task State

Ignore Task Deps

Run

Past

Future

Upstream

Downstream

Recursive

Failed

Clear

Past

Future

Upstream

Downstream

Mark Failed

Past

Future

Upstream

Downstream

Mark Success

Close

Task Instance: analyze_results at

2021-09-23 00:00:00+00:

- Task Instance Details

< > Rendered Template

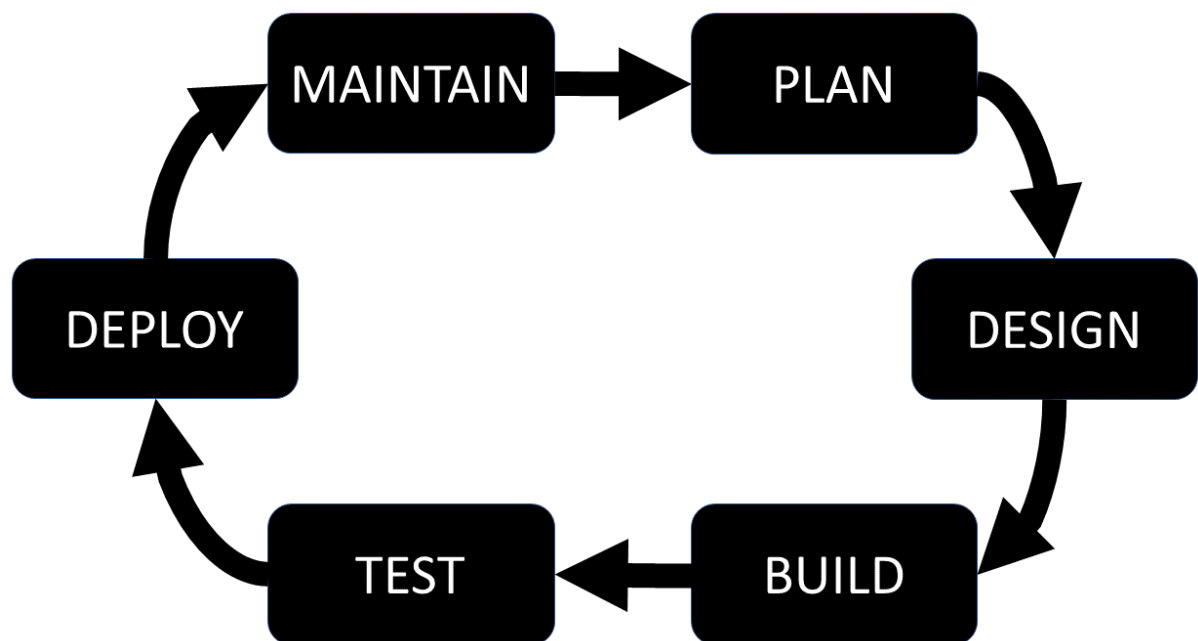
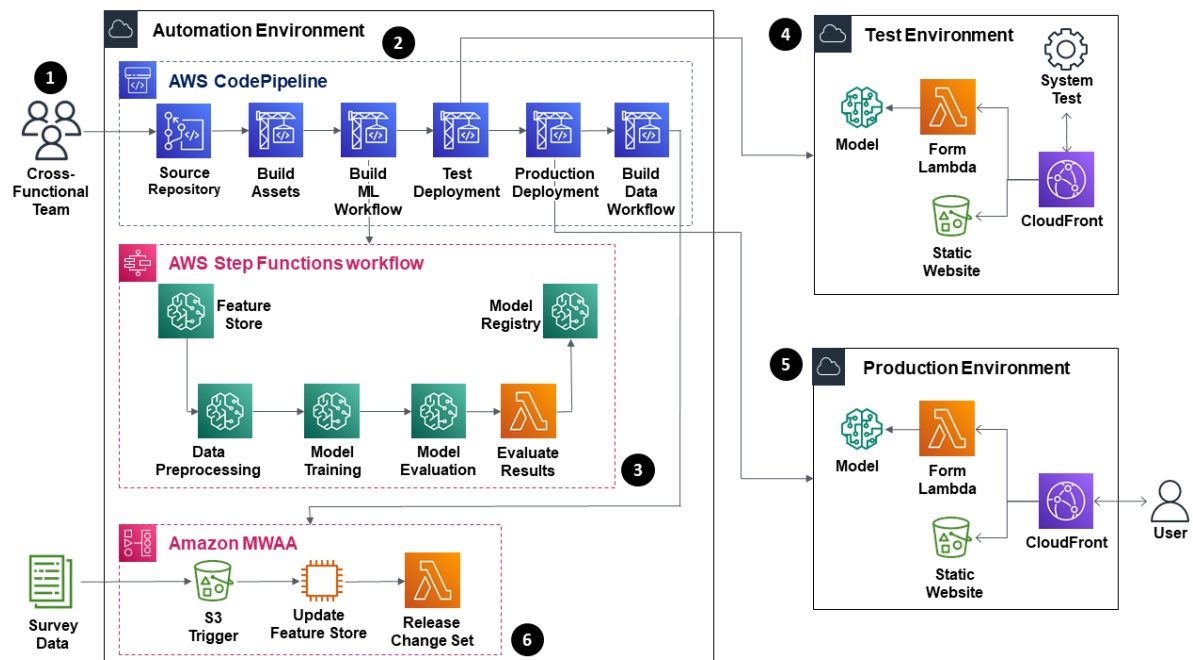
Log

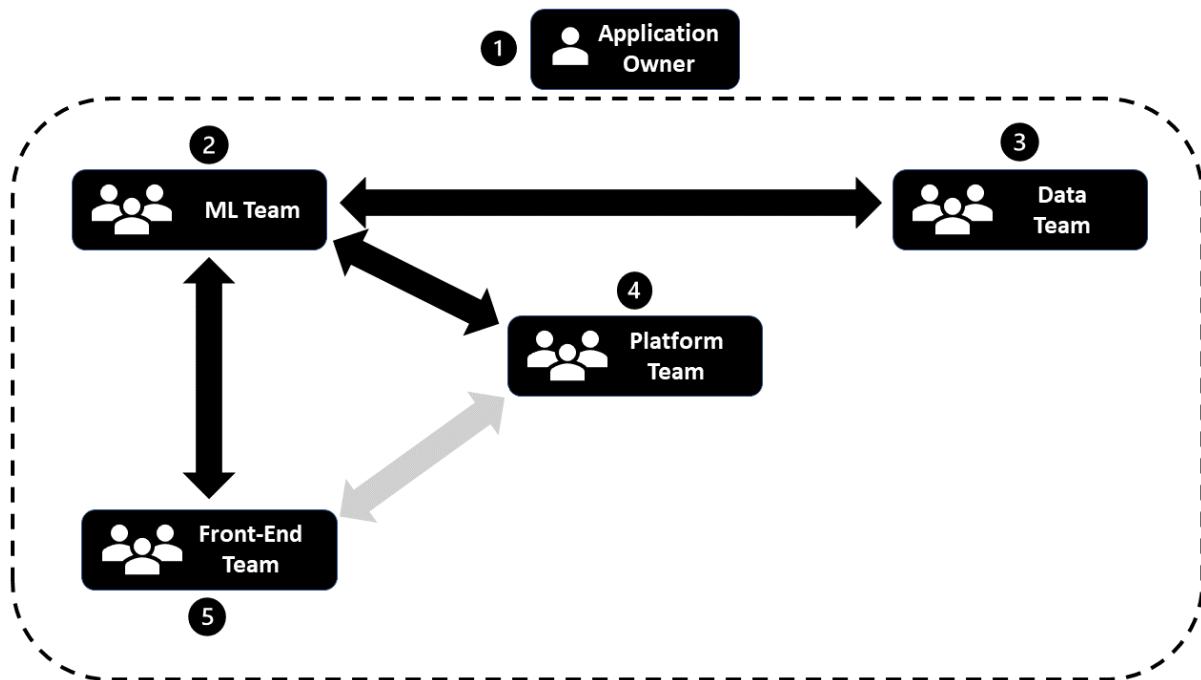
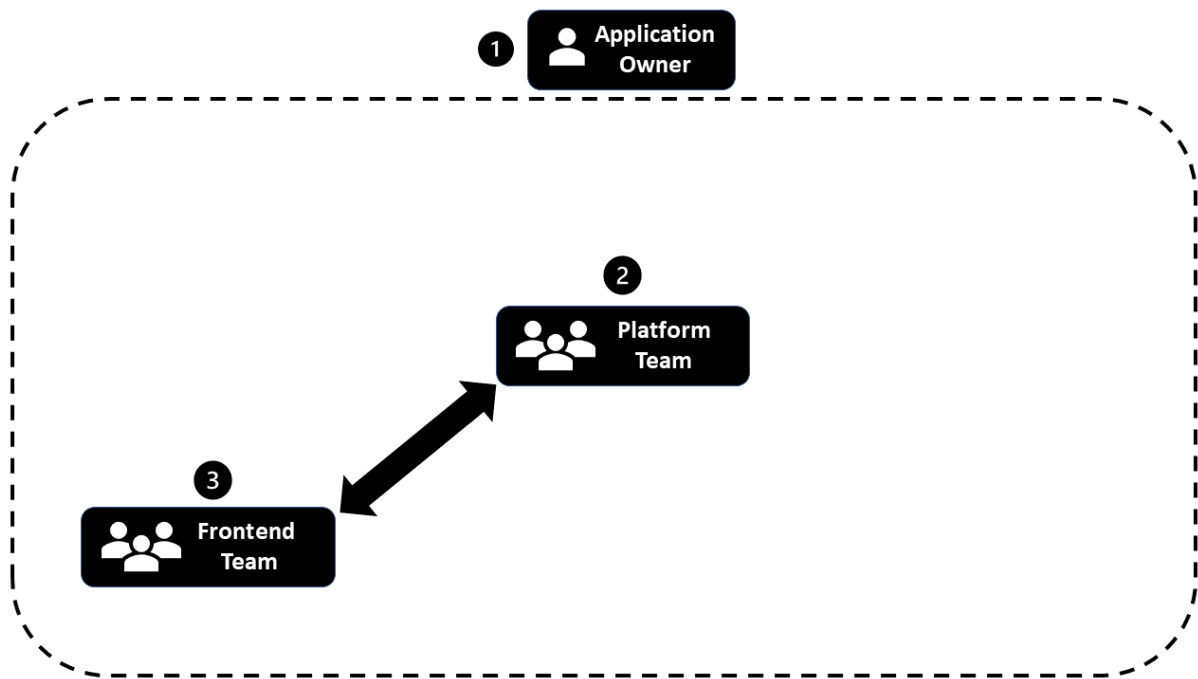
XCom

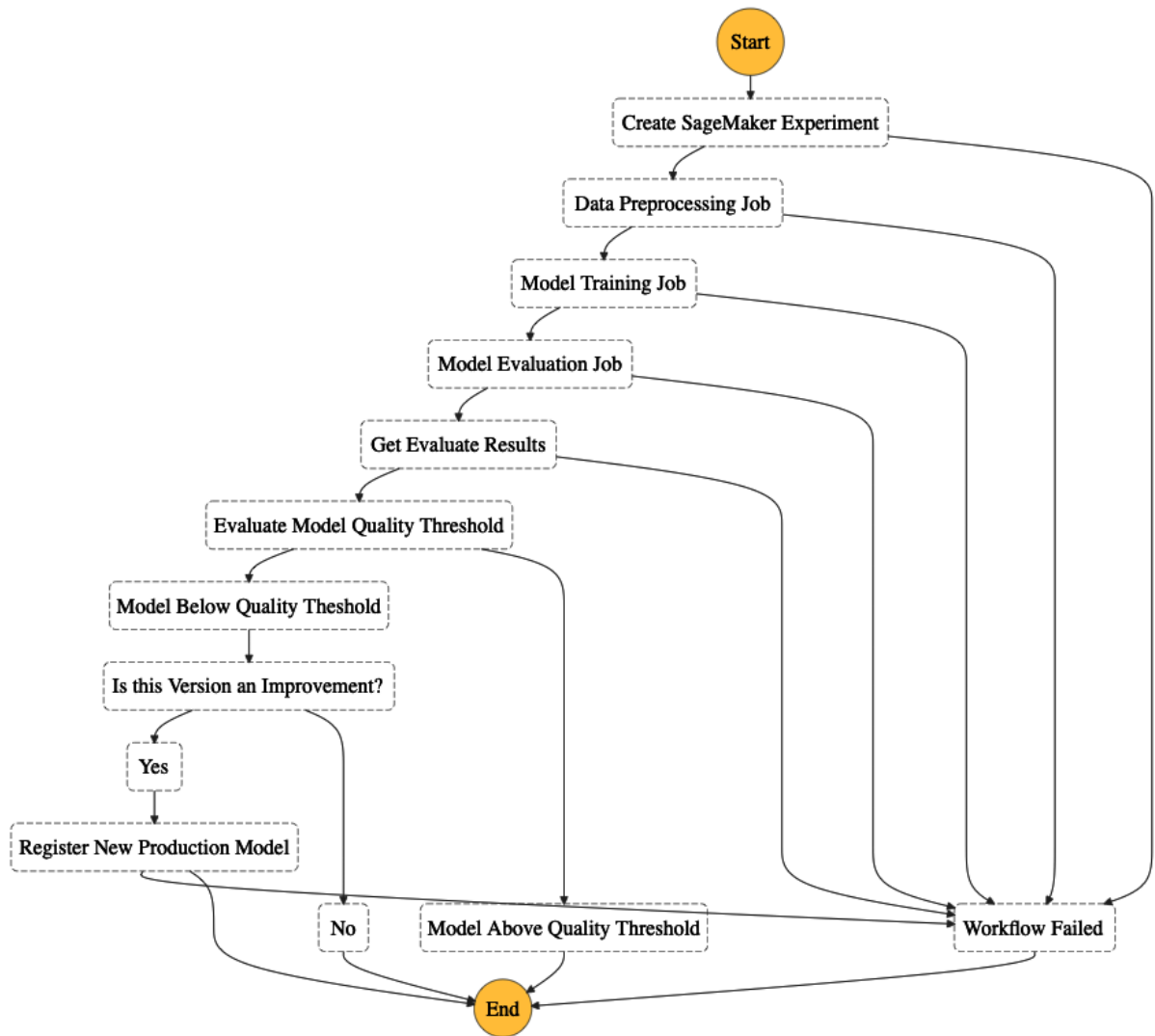
XCom

Key	Value
Results	2.1947150762327308

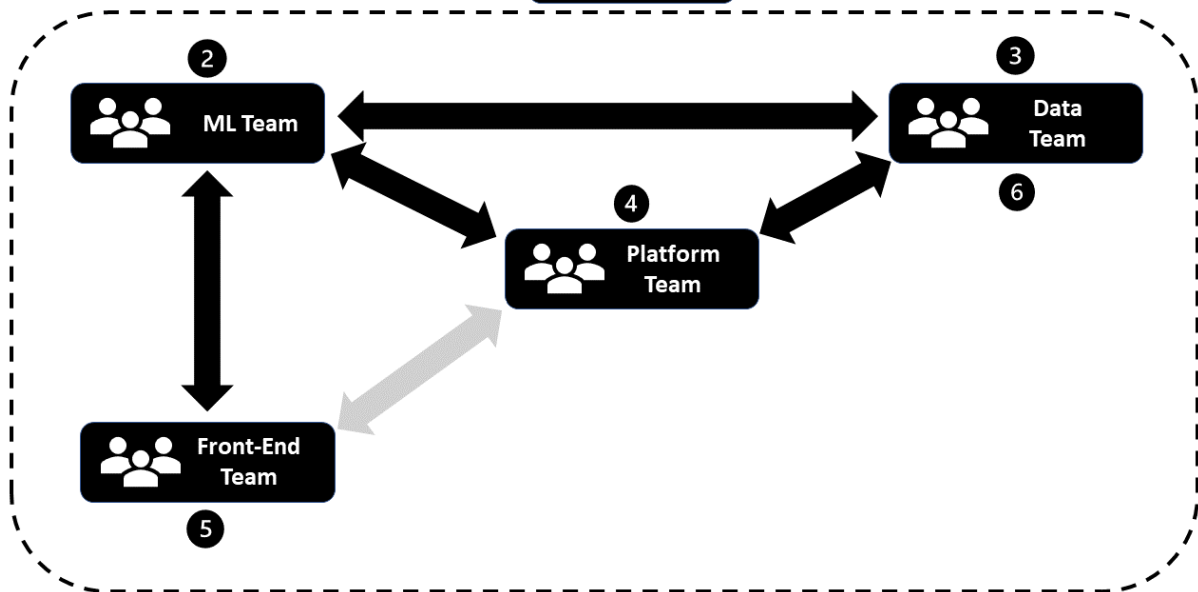
Chapter 10: An Introduction to the Machine Learning Software Development Life Cycle (MLSDLC)

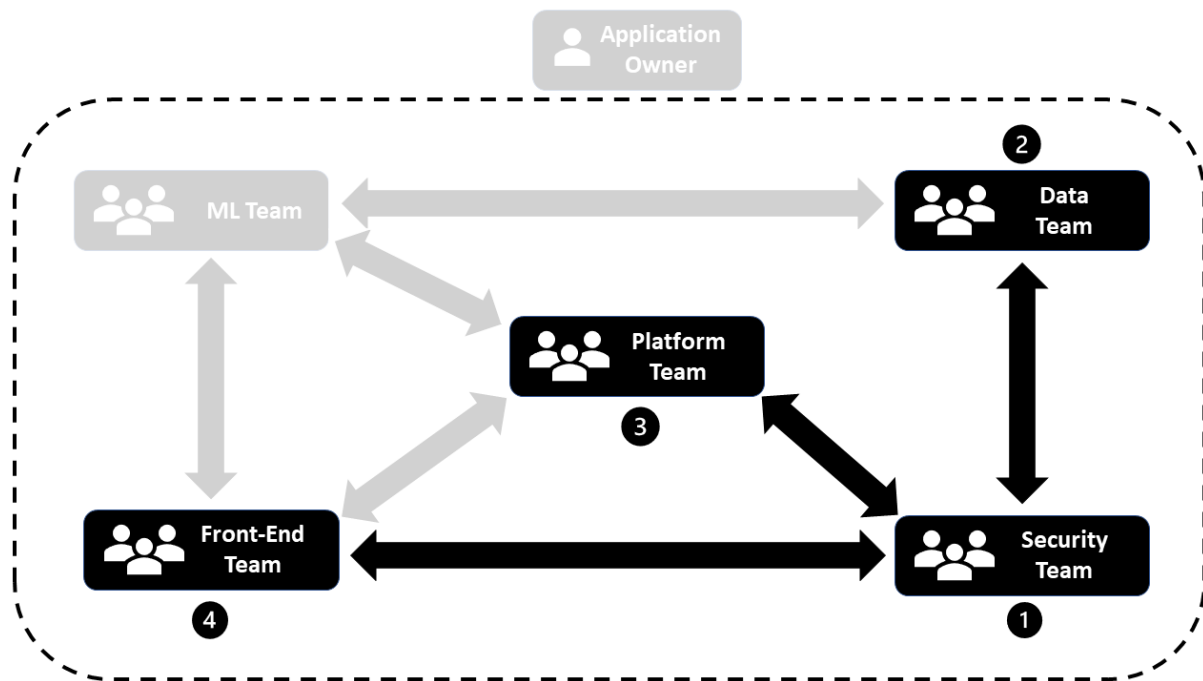




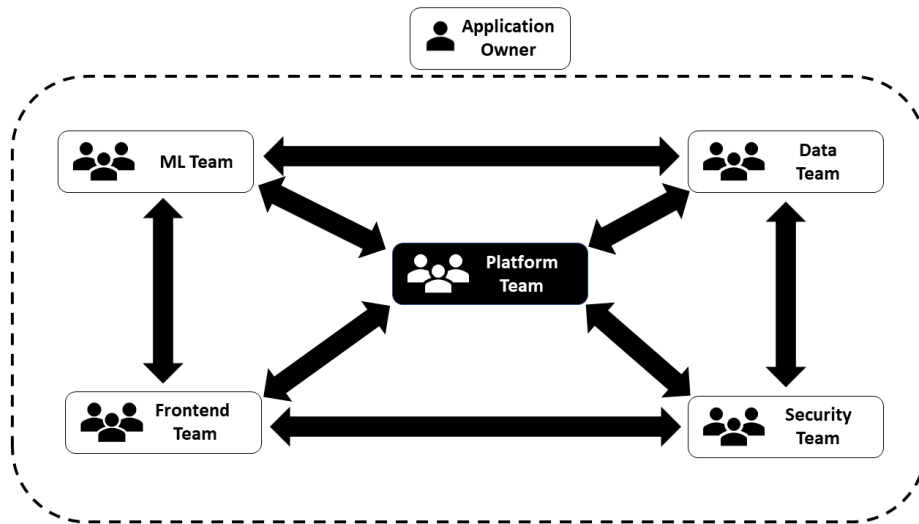


1 Application Owner





Chapter 11: Continuous Integration, Deployment, and Training for the MLSDLC



ACME-WebApp-Pipeline

Notify ▼

Edit

Stop execution

Clone pipeline

Release change

✓ Source Succeeded

Pipeline execution ID: 623d285a-bc45-4f36-8743-6ce4b158313b

acme-web-application ⓘ

[AWS CodeCommit](#)

✓ Succeeded - 15 hours ago

[c18061da](#)

[c18061da](#) acme-web-application: Checkpoint

Disable transition

✓ Build Succeeded

Pipeline execution ID: 623d285a-bc45-4f36-8743-6ce4b158313b

Synth ⓘ

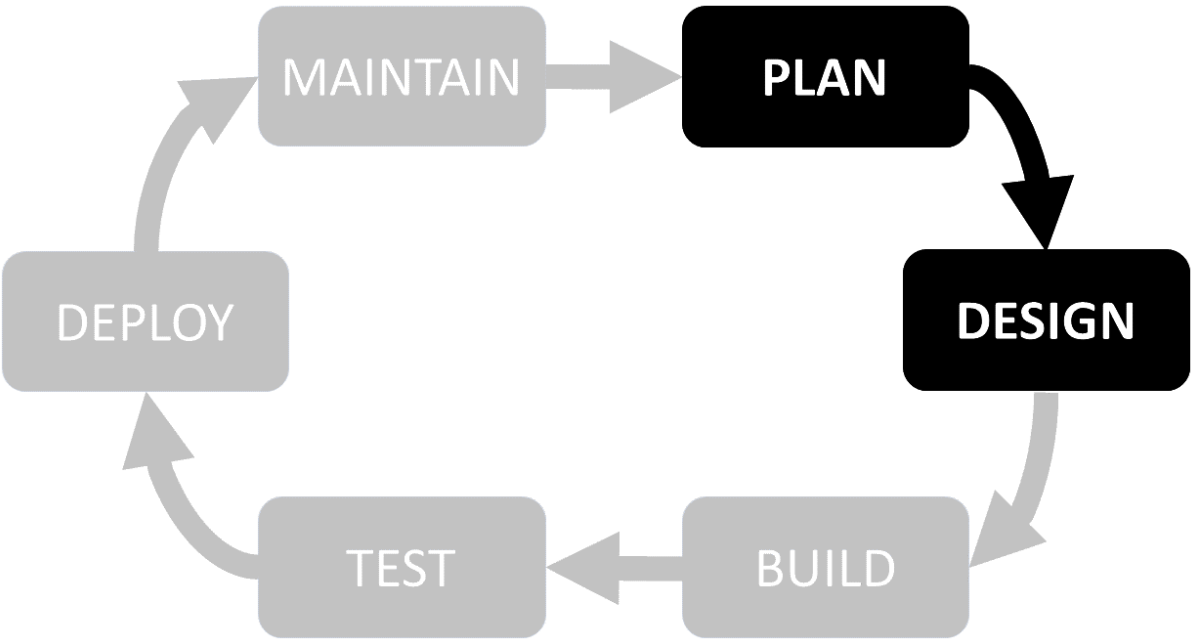
[AWS CodeBuild](#)

✓ Succeeded - 15 hours ago

[Details](#)

[c18061da](#) acme-web-application: Checkpoint





✔ **Assets** Succeeded

Pipeline execution ID: [4c9658fe-6dad-49e6-8a85-94d43faf07a5](#)

DockerAsset1 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	DockerAsset2 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset1 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details
FileAsset10 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset11 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset12 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details
FileAsset13 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset2 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset3 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details
FileAsset4 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset5 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset6 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details
FileAsset7 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset8 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details	FileAsset9 ⓘ AWS CodeBuild ✔ Succeeded - 51 minutes ago Details

[5a696e77](#) acme-web-application: Setting to C5

✔ **Build-MLWorkflow** Succeeded

Pipeline execution ID: [4c9658fe-6dad-49e6-8a85-94d43faf07a5](#)

MLWorkflowStack.Prepare



[AWS CloudFormation](#) 

✔ **Succeeded** - 51 minutes ago

[Details](#) 



MLWorkflowStack.Deploy



[AWS CloudFormation](#) 

✔ **Succeeded** - 51 minutes ago

[Details](#) 



Execute-MLWorkflow

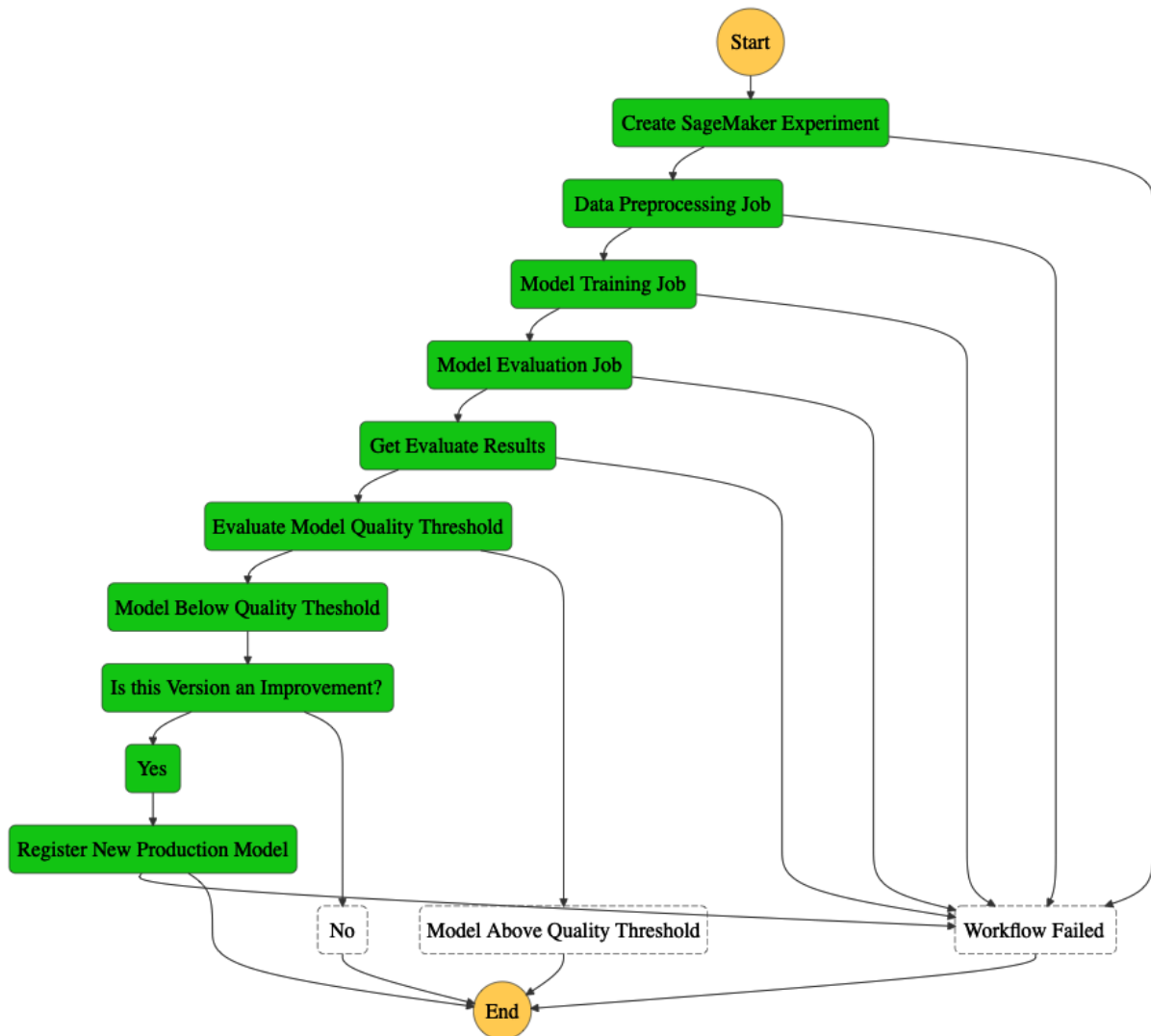


[AWS CodeBuild](#)

✔ **Succeeded** - 32 minutes ago

[Details](#)

[5a696e77](#) acme-web-application: Setting to C5



VERSION 1

Status	Generated by	Model group	Update status
Approved	CDK Pipeline	AbalonePackageGroup	

Activity	Metrics	Settings
Model metric	Metric value	Standard deviation
rmse	1.990679744402281	1.9735496251506863
mse	3.962805844773531	1.9735496251506863

Experiment: AbaloneExperiments

Trial: Abalone-3057f2f9-9693-4136-ab4a-c4cc64dbe83f

Trial Component Created: 5 hours ago

Trial Component Status: Completed

Training job detailed status: Completed

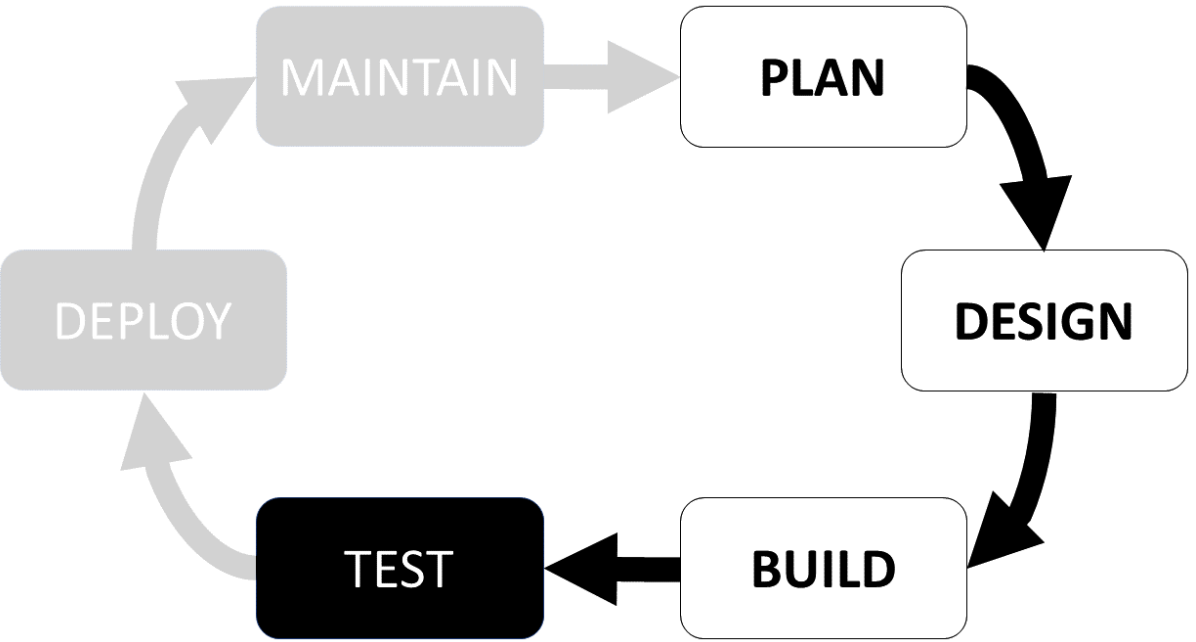
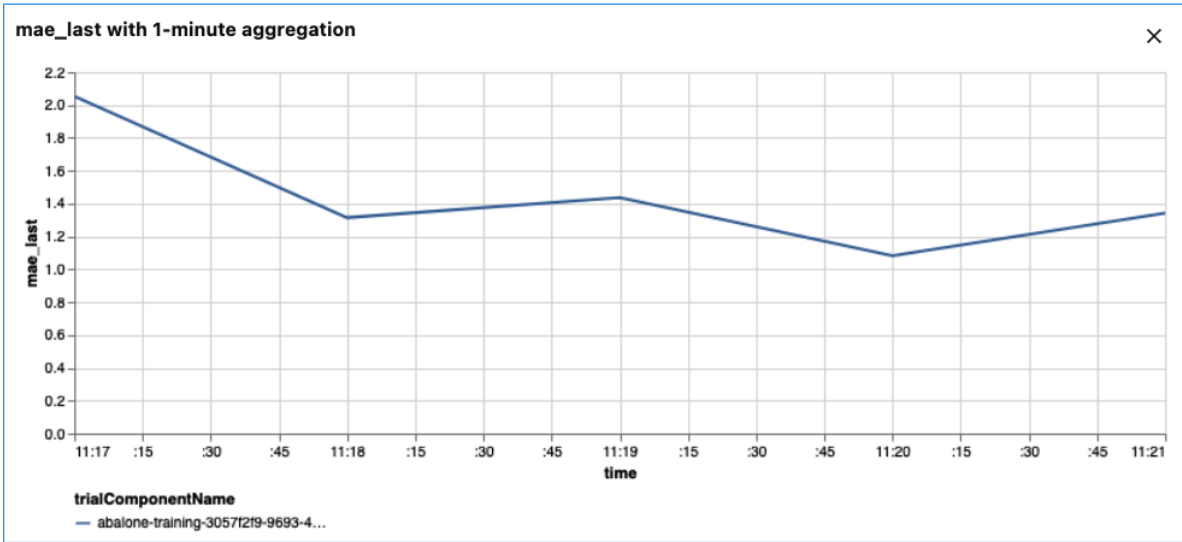
Trial components:

Training

ChartsMetricsParametersArtifactsAWS settingsDebuggerModel explainabilityBias reportTrial Mappings

4 CHARTS

Add chart



✓ **Test-Deployment** Succeeded

Pipeline execution ID: [4c9658fe-6dad-49e6-8a85-94d43faf07a5](#)

TestApplicaitonStack.Prepare

[AWS CloudFormation](#) 

✓ **Succeeded** - 32 minutes ago

[Details](#) 



TestApplicaitonStack.Deploy

[AWS CloudFormation](#) 

✓ **Succeeded** - 26 minutes ago

[Details](#) 



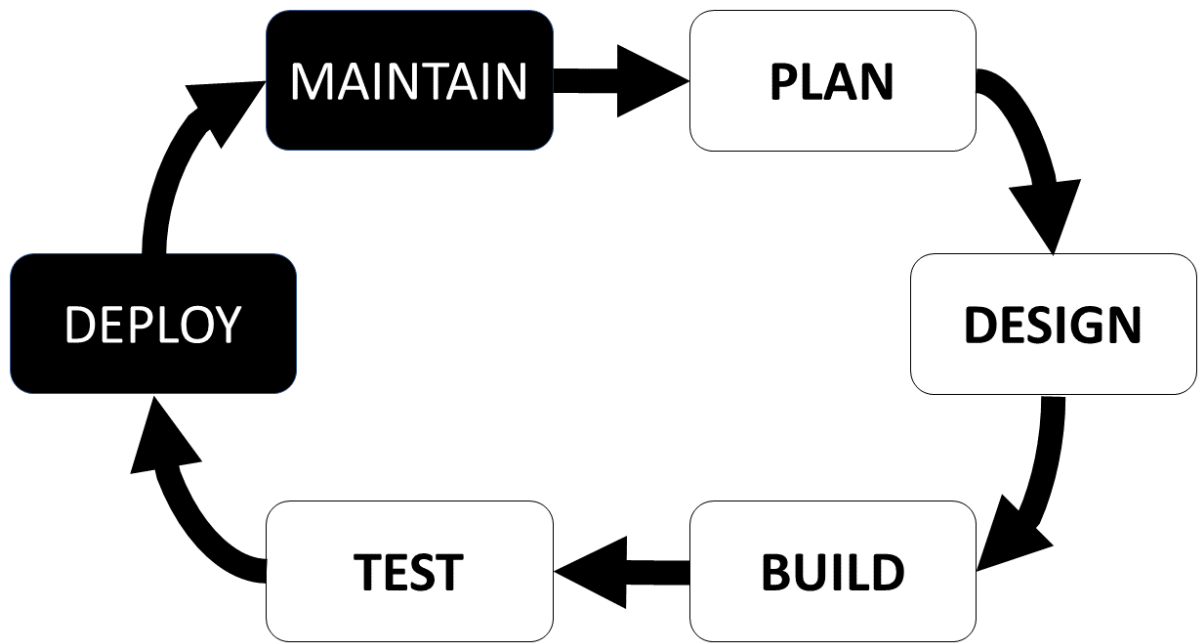
System-Tests

[AWS CodeBuild](#)

✓ **Succeeded** - 25 minutes ago

[Details](#)

[5a696e77](#) acme-web-application: Setting to C5



✓ **Production-Deployment** Succeeded

Pipeline execution ID: [4c9658fe-6dad-49e6-8a85-94d43faf07a5](#)

Prepare



[AWS CloudFormation](#) 

✓ **Succeeded** - 26 minutes ago

[Details](#) 



Deploy

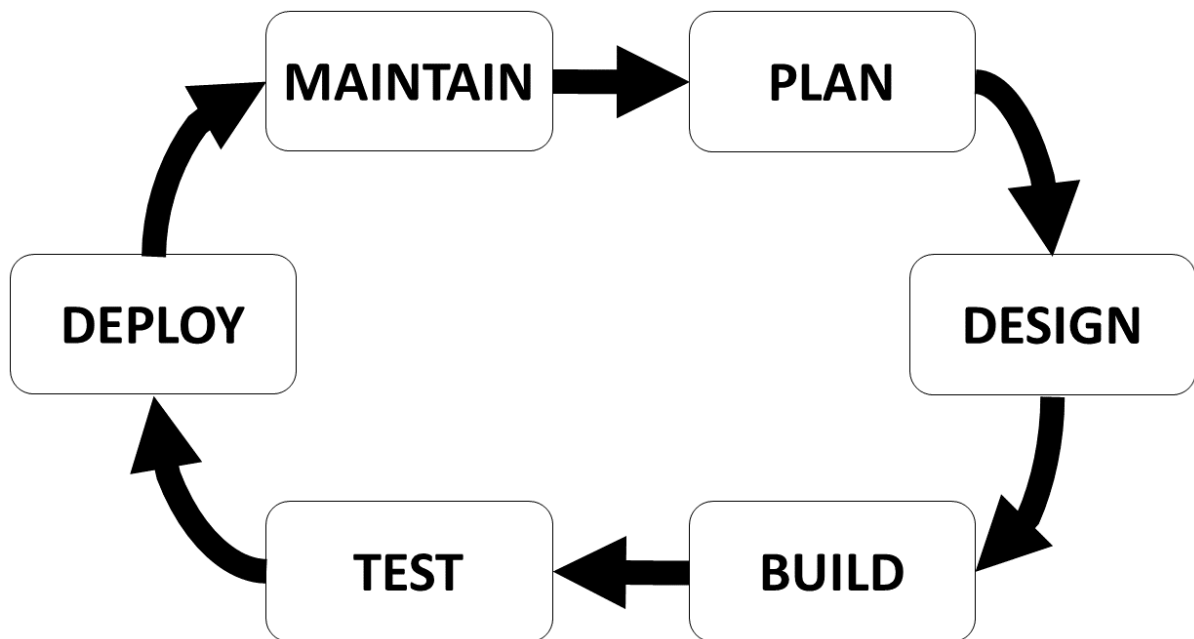


[AWS CloudFormation](#) 

✓ **Succeeded** - 15 minutes ago

[Details](#) 

[5a696e77](#) acme-web-application: Setting to C5



Production-Deployment-ProdApplicationStack

Delete

Update

Stack actions ▼

Create stack ▼

Stack Info

Events

Resources

Outputs

Parameters

Template

Change sets

Outputs (2)



Search outputs



Key ▲	Value ▼	Description ▼	Export name ▼
CloudFrontURL	http://d2lg0n5c8er1k0.cloudfront.net	-	-
FormAPIURL	https://bxcvqiy20.execute-api.us-west-2.amazonaws.com/	-	-

ACME Fishing Logistics

Preventing Abalone Overfishing

[TRY OUR AGE CALCULATOR](#)

Who are we?

We are an organization that strives to prevent the overfishing of the abalone sea snail. We do this by using cutting edge, predictive Artificial Intelligence (A.I.) technologies to help abalone fishermen determine whether or not their catch meets the age requirements for capture.



"Team work", from [pxfuel](#), licensed under [CC0 Public Domain](#)

Calculate Abalone Age



Please enter the details about the **Abalone** in order to predict the age.

Length:

Diameter:

Height:

Whole Weight:

Shucked Weight:

Viscera Weight:

Shell Weight:

Abalone Sex:

Submit

Age Prediction



We've calculated that the Abalone has **10** rings, and is therefore approximately **11.5** years old.

Close

s3_trigger



update_fg



trigger_release_change

✔ Build-DataWorkflow Succeeded

Pipeline execution ID: [a466c7ce-9d99-4135-8d7e-e9f7f9be9e71](#)

Prepare



[AWS CloudFormation](#)

✔ Succeeded - 1 hour ago

[Details](#)



Deploy



[AWS CloudFormation](#)

✔ Succeeded - 1 hour ago

[Details](#)

[dd86eaeef](#) acme-web-application: Finalized CDK applciation

s3_trigger

→ update_fg

→ trigger_release_change