



# Introduction to the Wonders of Azure DevOps

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# Anna Wykes

Principal Consultant

- 16+ Years Microsoft Data Analytics
- Intensive Software & Data Engineering Experience
- Microsoft AI MVP, Data Consultant & Public Speaker



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# Falek Miah

Principal Consultant

- 15+ Years Microsoft Data Analytics
- Intensive Data Engineering Experience
- Data, Cloud & DevOps Enthusiast
- Databricks Champion and Microsoft Azure & Terraform (HashiCorp) certified engineer



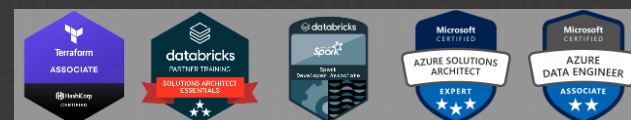
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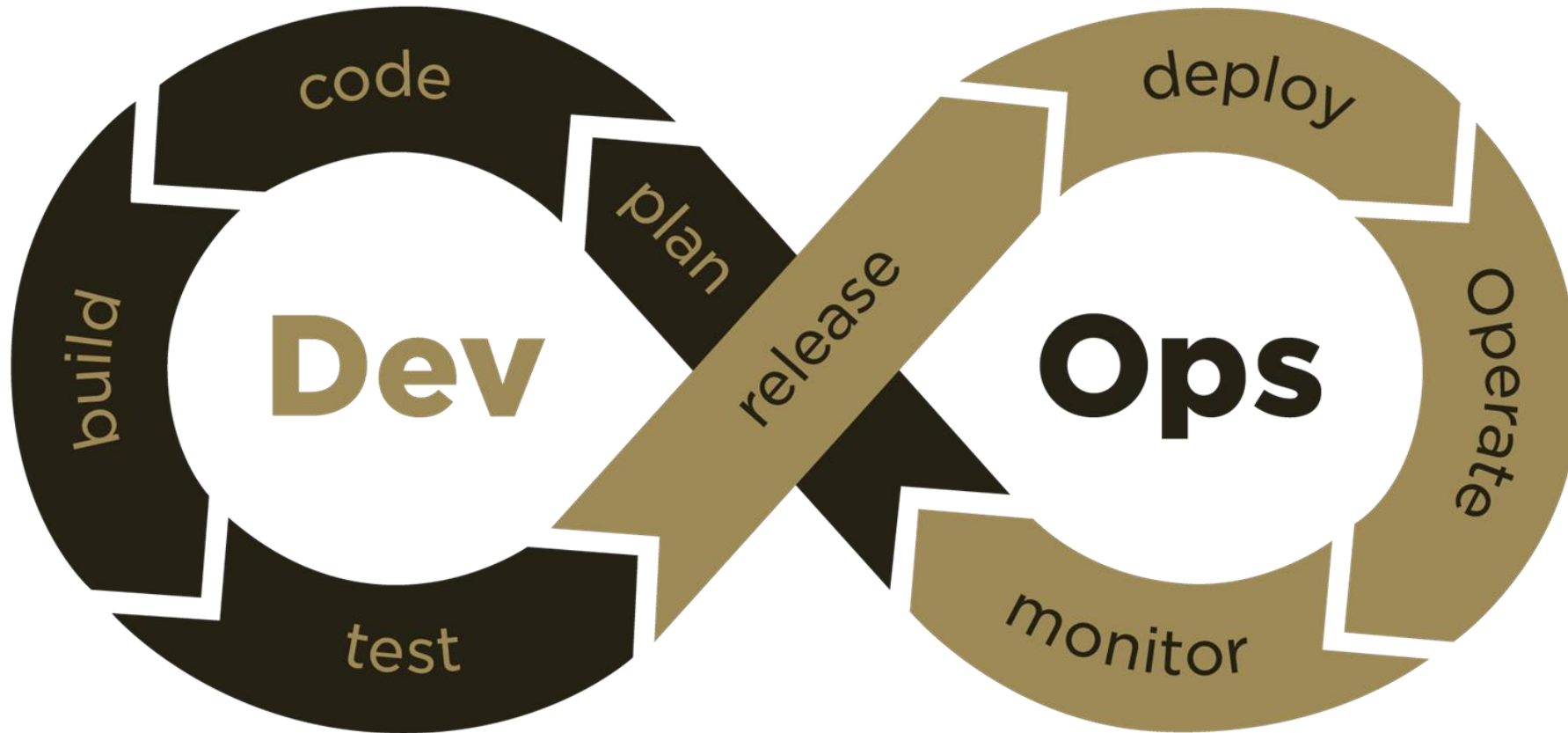
# What is DevOps





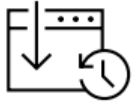
# What is DevOps

“DevOps is the union of **people**, **process**, and **products** to enable **continuous delivery** of value to our end users.”





# Continuous Delivery



## Continuous Integration (CI)

- Improve development
- Build and test solutions
- Detecting bugs
- Rollback



## Continuous Deployment (CD)

- Deploy identical solutions
- Code committed to production





# DevOps Tools







# Azure DevOps





# Azure DevOps



Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.



Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.



Azure Pipeline

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.



Azure Test Plan

Test and ship with confidence using manual and exploratory testing tools.



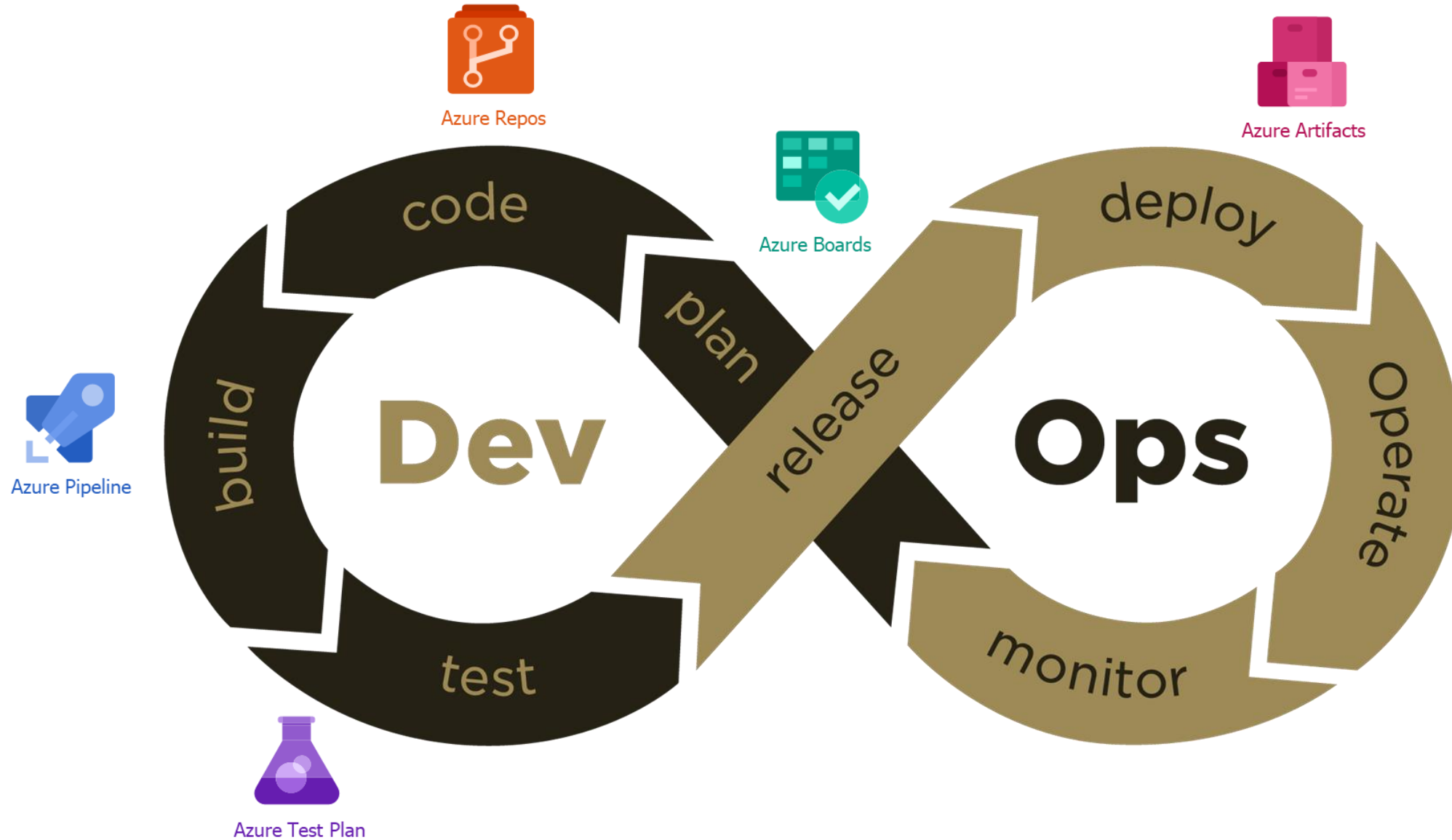
Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.





# Azure DevOps





# Wonders of Azure DevOps



YAML Pipeline



Build (CI) Pipeline



Deployment (CD)  
Pipeline



Branch Policies



Deployment  
Workflow



Unit Test

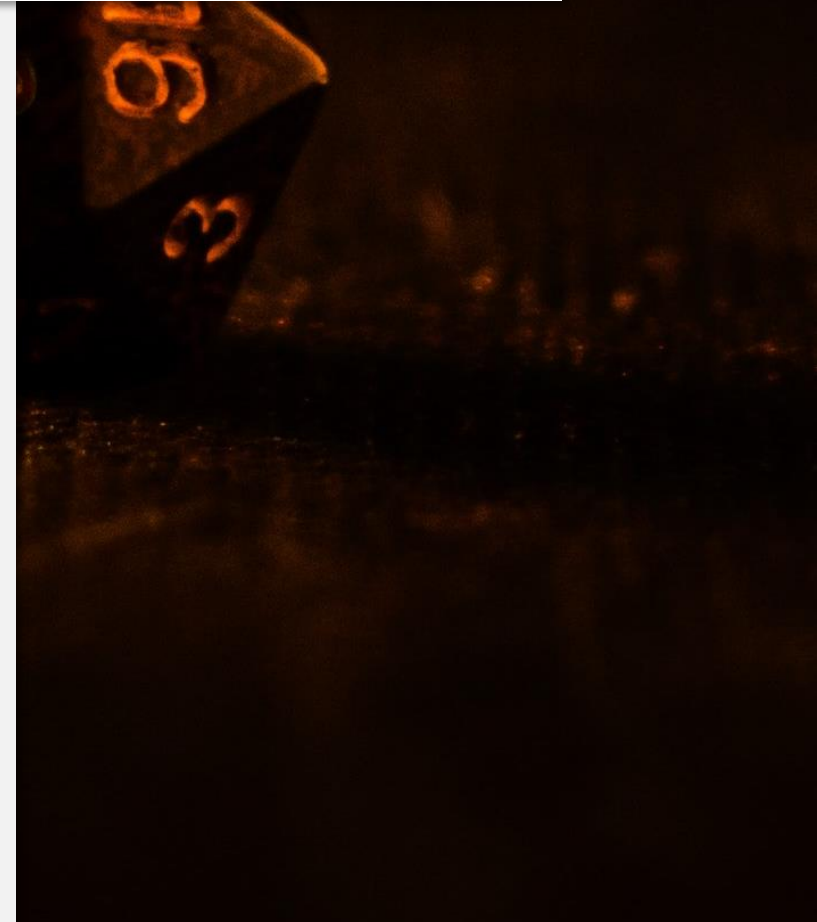


Library



# Demo: Azure DevOps

- Azure DevOps components







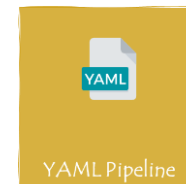
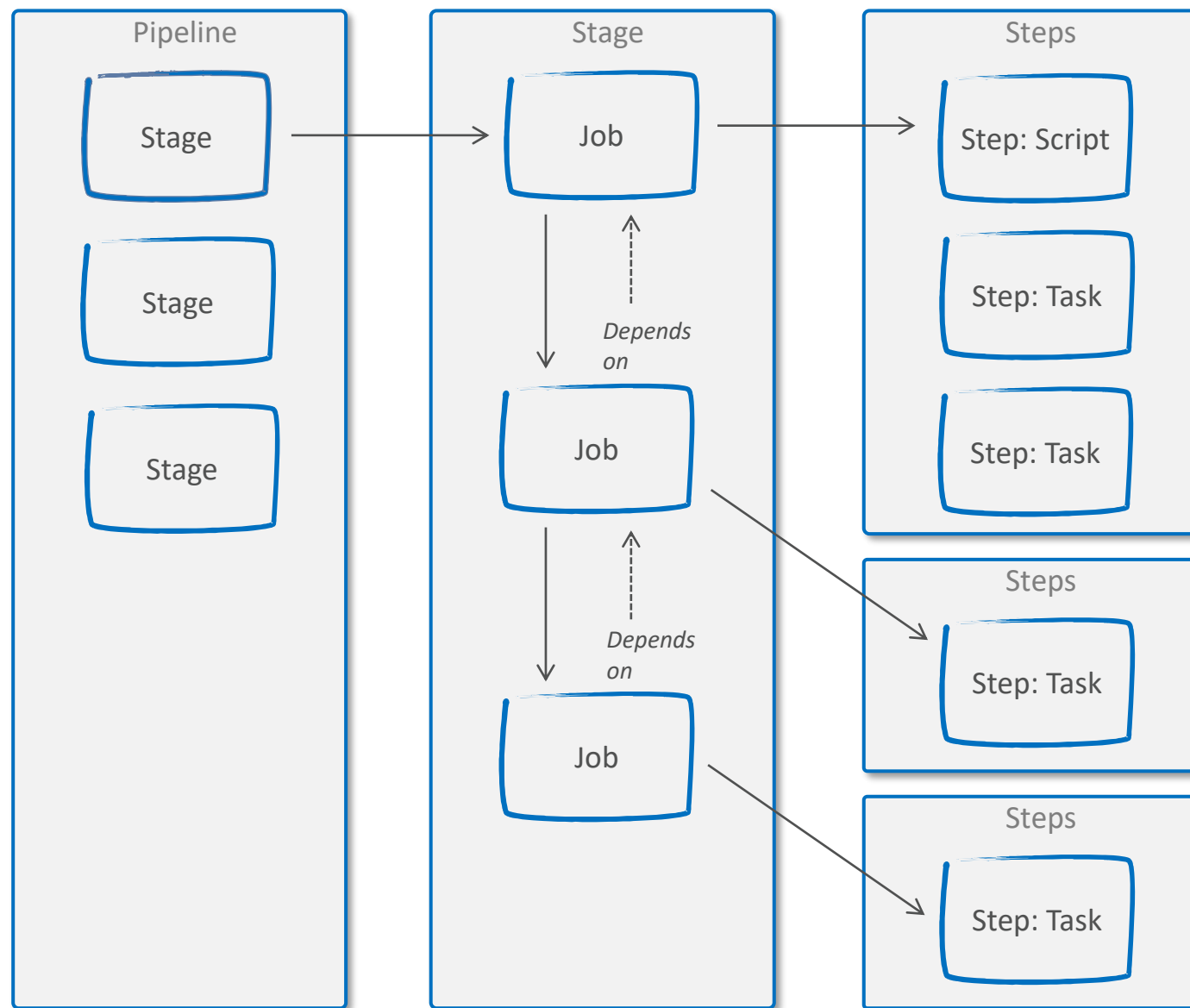
# YAML Pipeline



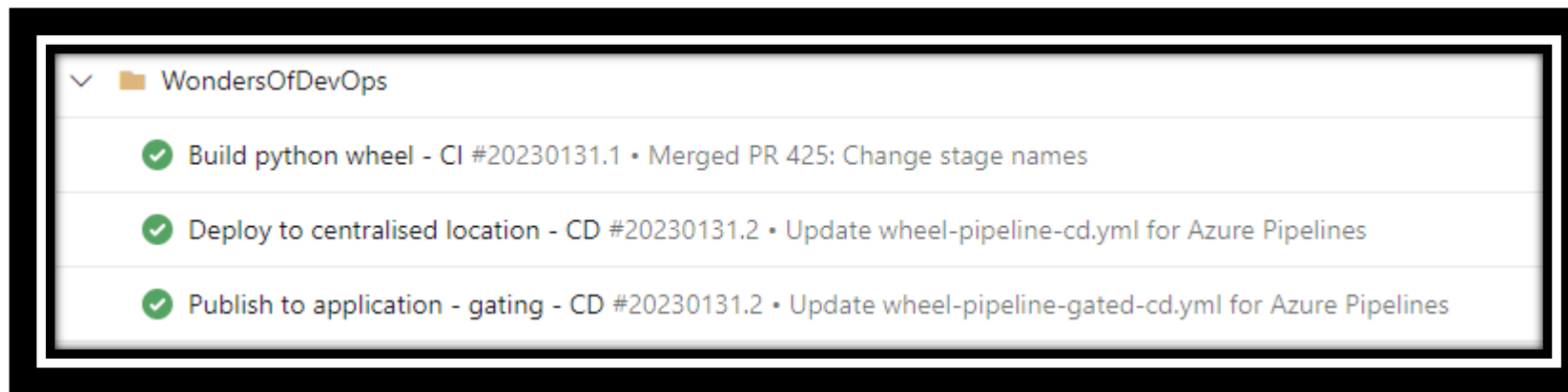
# YAML Pipeline

Consist of:

- Stages
- Jobs
- Steps



# Our YML Pipelines





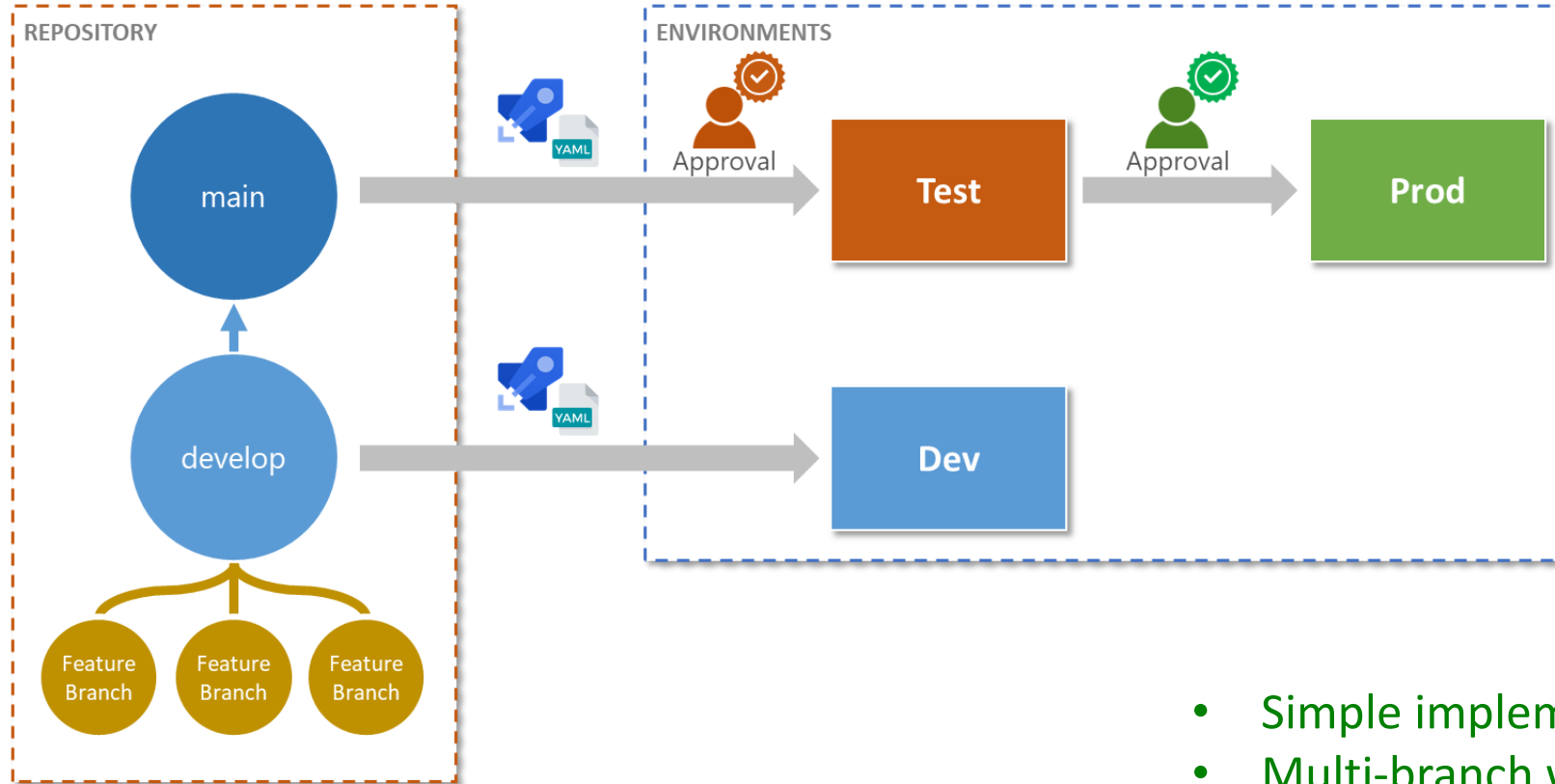
# Deployment Workflow



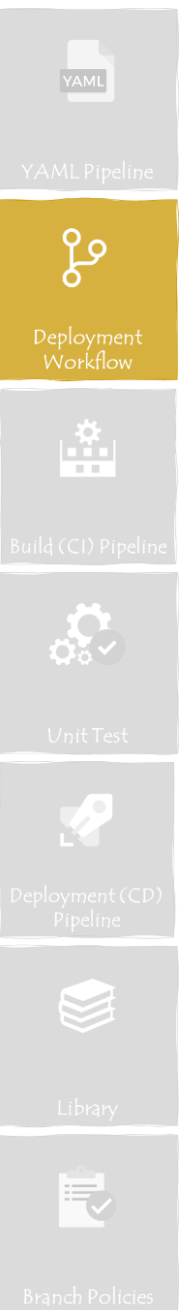


# Deployment Workflow

## Git Flow



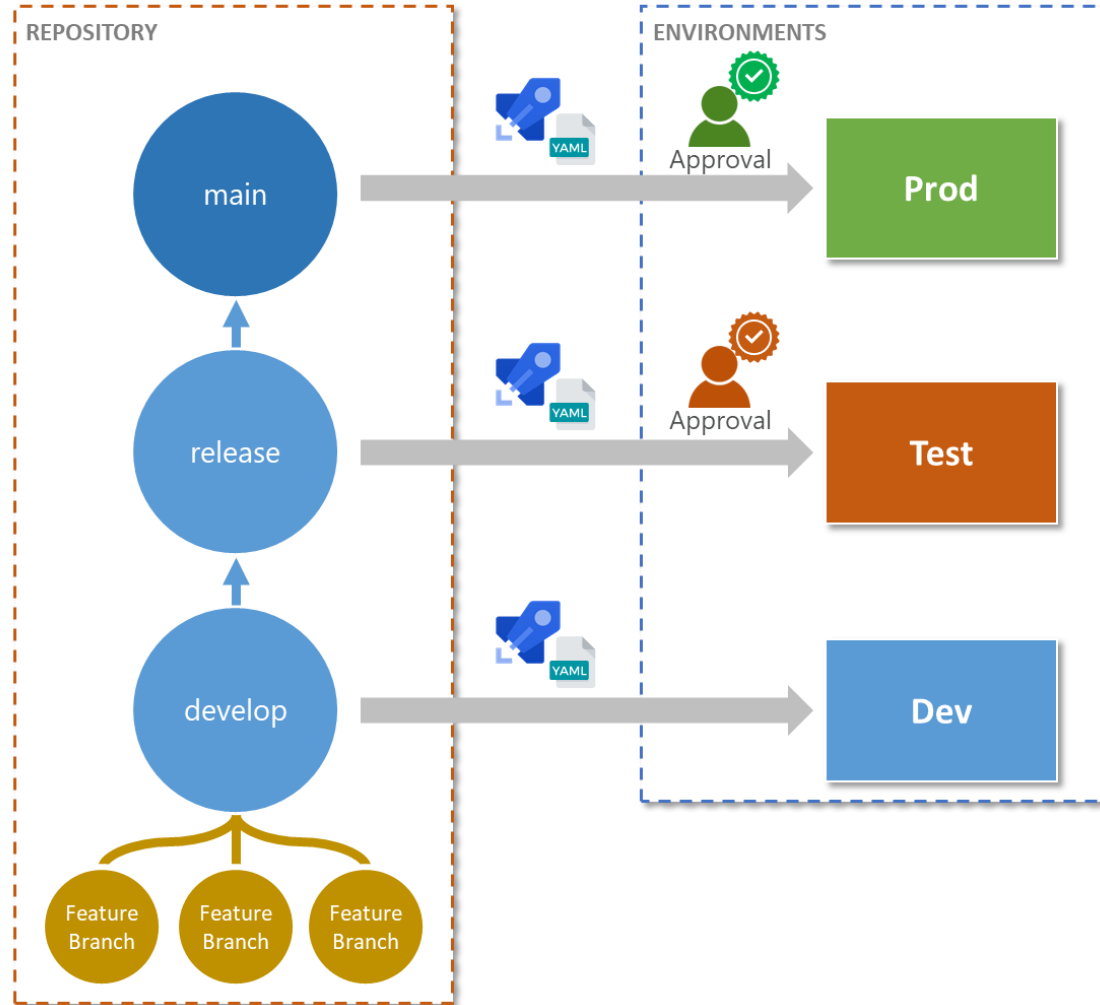
- Simple implement and manage
- Multi-branch with specific purposes
- Git history hard to read



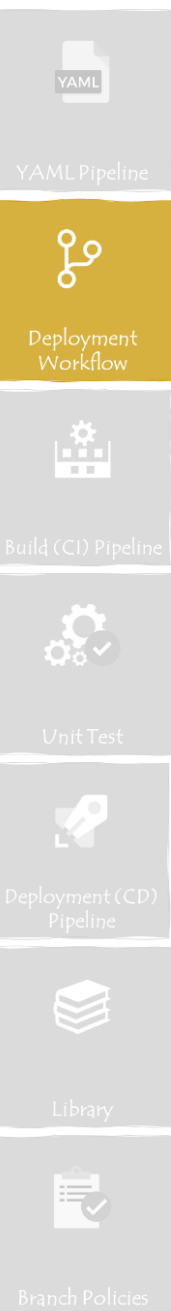


# Deployment Workflow

## GitLab Flow



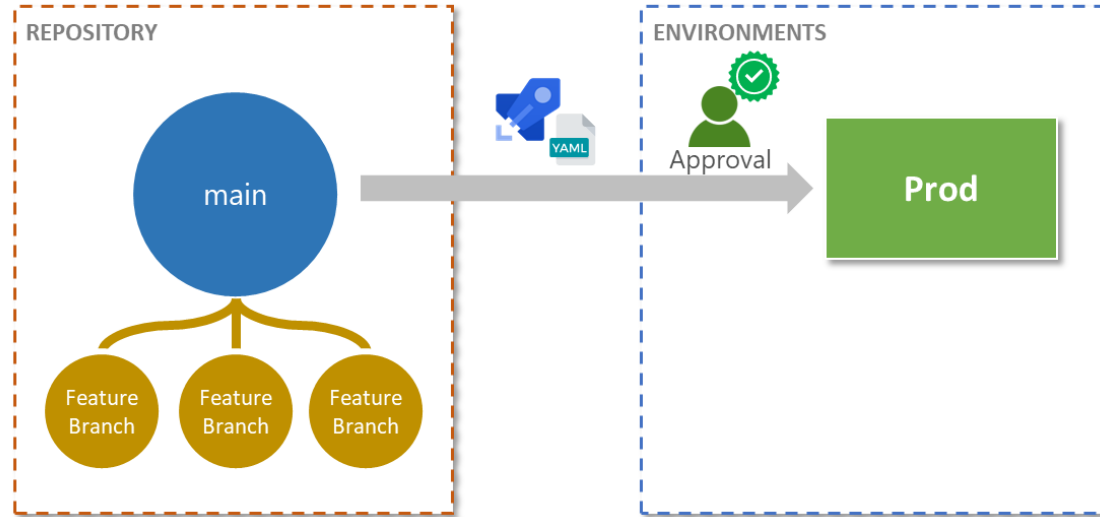
- Isolation between environments
- Multi-branch with specific purposes
- Git history clean and easy to read
- Complex to implement and manage
- Branches complicated and messy





# Deployment Workflow

## GitHub Flow



- Simple approach and workflow
- Git history clean and easy to read
- Good for maintain a single production version
- Not ideal for maintaining multiple versions of the code
- Unstable production code

YAML

YAML Pipeline



Deployment Workflow



Build (CI) Pipeline



Unit Test



Deployment (CD) Pipeline



Library



Branch Policies

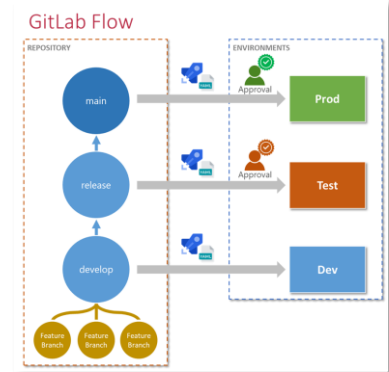
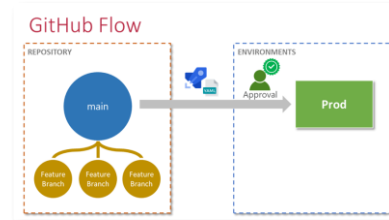
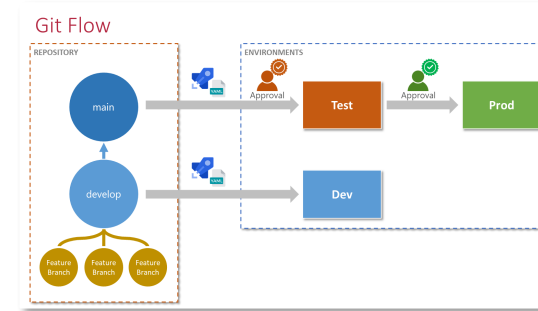


**ADVANCING ANALYTICS**



# Deployment Workflow - Strategy

- Pick one approach
  - Develop a branch strategy
  - Keep your branch strategy **simple**
  - Use **feature** branches
- 
- Use a consistent **naming convention**
  - Use **pull requests** for merges
  - Set up a **Branch Policy**
- 
- Use Release branches
  - Consider Release tags



```
<id>-<workID>-<taskName>
```



YAML Pipeline



Deployment Workflow



Build (CI) Pipeline



Unit Test



Deployment (CD) Pipeline



Library



Branch Policies



**ADVANCING ANALYTICS**



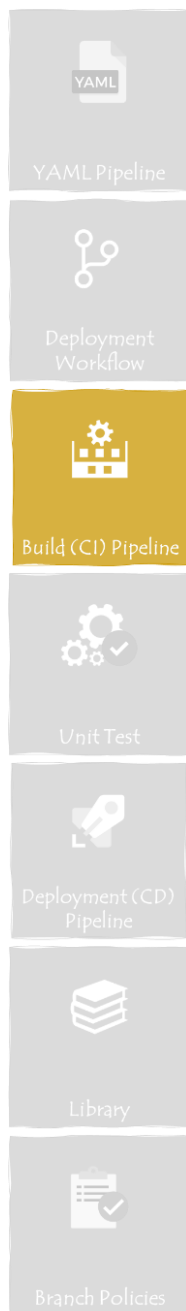
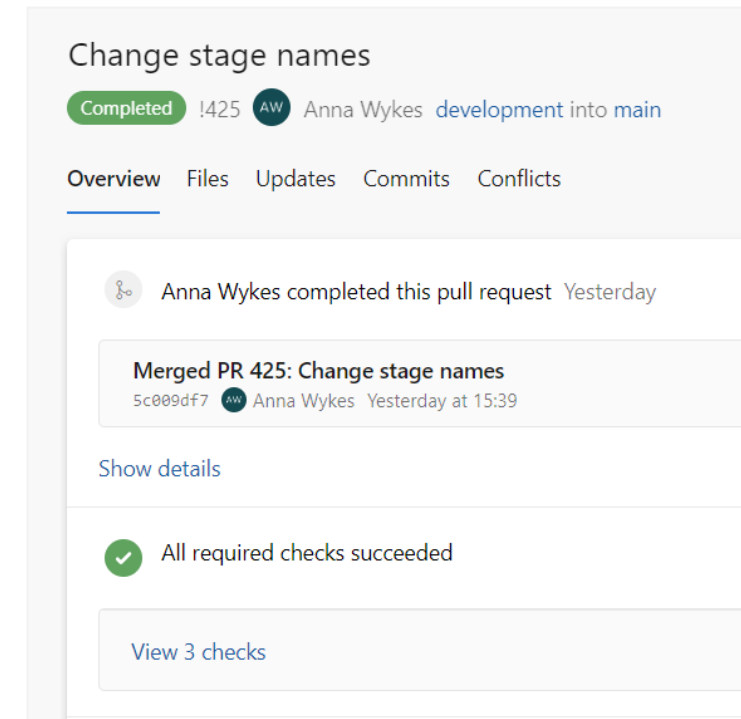


# Build (CI) Pipeline



# Build (CI) Pipeline

- Purpose
  - Run every time a change is added to a core branch e.g. Main/Development/Test
  - Builds solution (and thus makes sure it builds ok)
  - Runs tests (End to End/Integration/Unit)
- Build during PR
  - Why it's a benefit
    - Checking quality code
    - Approve PR based on build





# Unit Test



# Unit Test

- Python Unit Test of basic Python Code
- View results in Azure DevOps UI

```
def my_wheel():  
    print("this is my wheel")  
    return "value"
```

```
import helloworld.demo as dem  
def test_demo():  
    result = dem.my_wheel()  
    resultJson = str(result)  
    expectedResult = str("value")  
    assert resultJson == expectedResult
```

YAML

YAML Pipeline



Deployment  
Workflow



Build (CI) Pipeline



Unit Test



Deployment (CD)  
Pipeline



Library



Branch Policies







# Deployment (CD) Pipeline



# Deployment (CD) Pipeline

- Purpose CD Pipeline
  - Build solution & Run tests (as with CI Pipeline)
  - Deploy solution to selected environment(s)
- Approver/Gates
  - Auto-approvers

Approvals

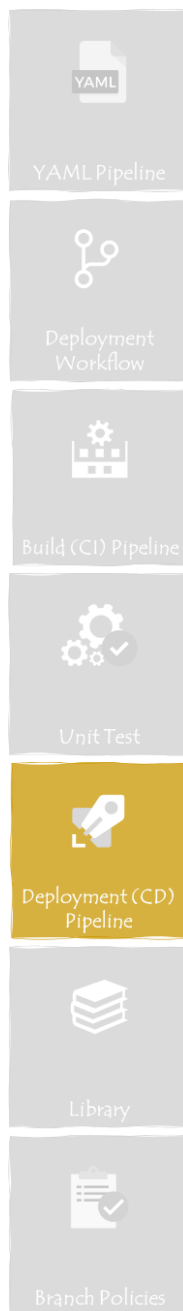
Approvers

Anna Wykes X +

Instructions to approvers (optional)

Advanced

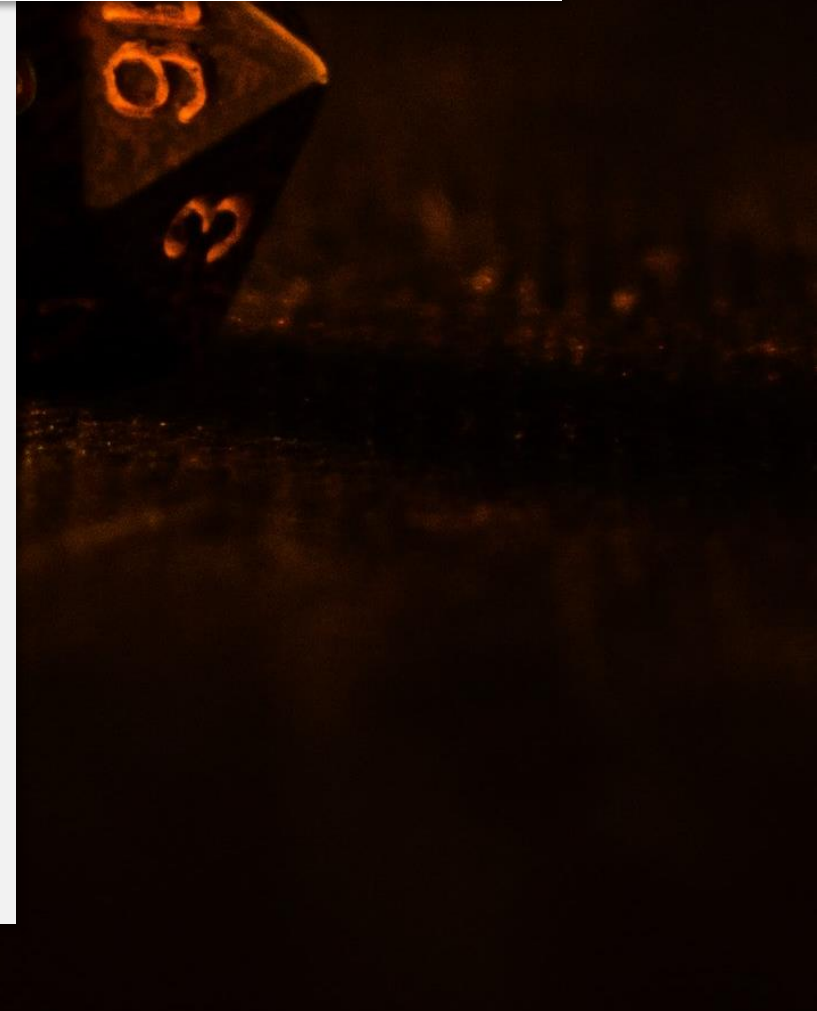
Control options





# Demo: CI/CD Pipeline

- YAML Pipeline
- Build CI Pipeline
- View Unit Tests - Python
- View results of wheel tests
- Deploy CD Pipeline with Approval





# Library







# Library

- Collection of Pipeline Assets
- Types of Assets
  - Variable Groups
  - Secure Files
- Variable Groups
  - Manually
  - Linked to Key Vault
- Security

Overview

Boards

Repos

Pipelines

Variable groups

Secure files

+ Variable group

Security

Help

Library > wonders-kv-vg-test

Variable group

Save

Clone

Security

Pipeline permissions

Approvals and checks

Help

Properties

Variable group name

wonders-kv-vg-test

Description

☒ Link secrets from an Azure key vault as variables ⓘ

Azure subscription \* | Manage ⓘ

Scoped to subscription 'AdvancingAnalytics\_6000'

Key vault name \* | Manage ⓘ

kv-adventureworks-uks

Assign security roles for Library

×

23

+ Add

?

Inheritance ▾

User	Role	Access
[AppliedInfraAsCode]\Build Administrators	Administrator ▾	Assigned
[AppliedInfraAsCode]\Contributors	Creator ▾	Assigned
[AppliedInfraAsCode]\Project Administrators	Administrator ▾	Assigned
[AppliedInfraAsCode]\Project Valid Users	Reader ▾	Assigned
[AppliedInfraAsCode]\Release Administrators	Administrator ▾	Assigned
AppliedInfraAsCode Build Service (AdvancingAnalytics)	Reader ▾	Assigned

New variable group

Create groups of variables that you can share across multiple pipelines.

+ Variable group

Learn more about variable groups. ⓘ

YAML Pipeline

Deployment Workflow

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Unit Test

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Library

Branch Policies



# Branch Policies



# Branch Policies

- Control Branch and Deployment
- Number of Policies
  - Branch Policies
  - Build validation
  - Status Checks
  - Automatically Include Reviewers

**main**

**Branch Policies**  
Note: If any required policy is enabled, this branch cannot be deleted and changes must be made via pull request.

<input type="radio"/> Off	<b>Require a minimum number of reviewers</b> Require approval from a specified number of reviewers on pull requests.
<input type="radio"/> Off	<b>Check for linked work items</b> Encourage traceability by checking for linked work items on pull requests.
<input type="radio"/> Off	<b>Check for comment resolution</b> Check to see that all comments have been resolved on pull requests.
<input type="radio"/> Off	<b>Limit merge types</b> Control branch history by limiting the available types of merge when pull requests are completed.

▼ **Build Validation** 0 Filter +  
Validate code by pre-merging and building pull request changes.  
No build policies found, but you can use the add button to create one!

▼ **Status Checks** 0 Filter +  
Require other services to post successful status to complete pull requests.  
No status checks found, but you can use the add button to create one!

▼ **Automatically included reviewers** 0 Filter +  
Designate code reviewers to automatically include when pull requests change certain areas of code.  
No automatic reviewer policies found, but you can use the add button to create one!



YAML Pipeline



Deployment Workflow



Build (CI) Pipeline



Unit Test



Deployment (CD) Pipeline



Library



Branch Policies

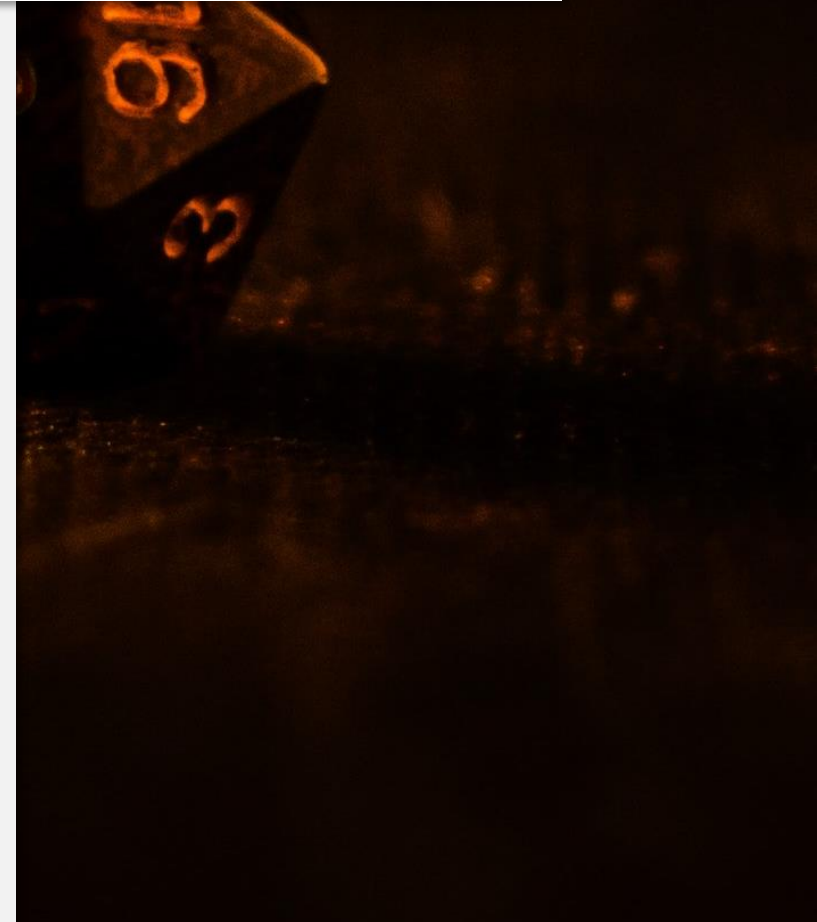


**ADVANCING ANALYTICS**



# Demo: Libraries & Branch Policies

- Library
- Branch Policies







# Recap

# Recap



 **TRY IT OUT**



Azure Boards



Azure Repos



Azure Pipeline



Azure Test Plan



Azure Artifacts



YAML Pipeline



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Deployment (CD)  
Pipeline



Branch Policies



Deployment  
Workflow



Unit Test



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Check out our YouTube channel and Blogs



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# Thank You



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