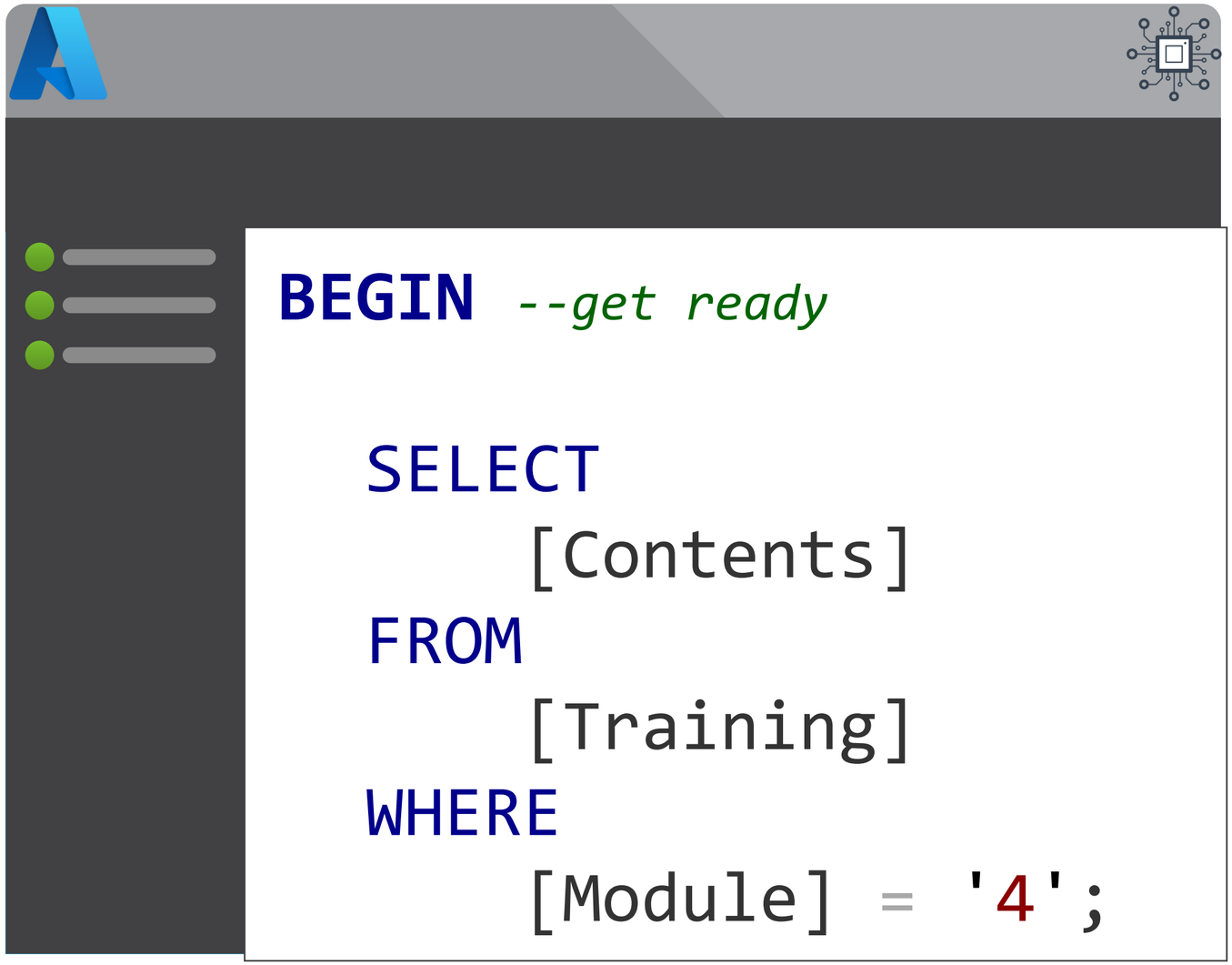
Module 4

Dynamic Pipelines



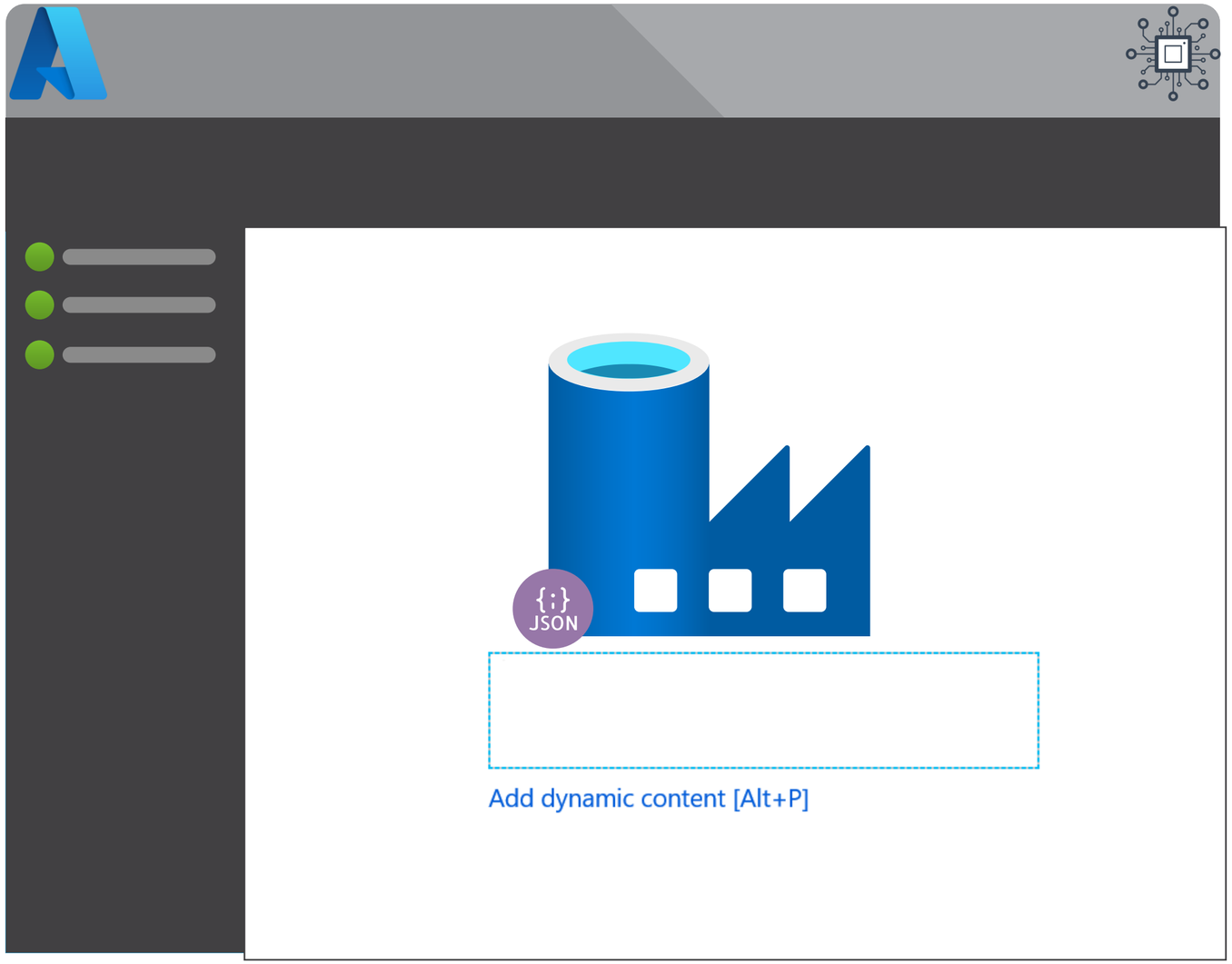
```
BEGIN --get ready

    SELECT
        [Contents]
    FROM
        [Training]
    WHERE
        [Module] = '4';
```

- Expressions & Interpolation
- Simple Metadata Driven Execution
- Dynamic Content Chains
- Reference Names

Module 4

Dynamic Pipelines



- Expressions & Interpolation
- Simple Metadata Driven Execution
- Dynamic Content Chains
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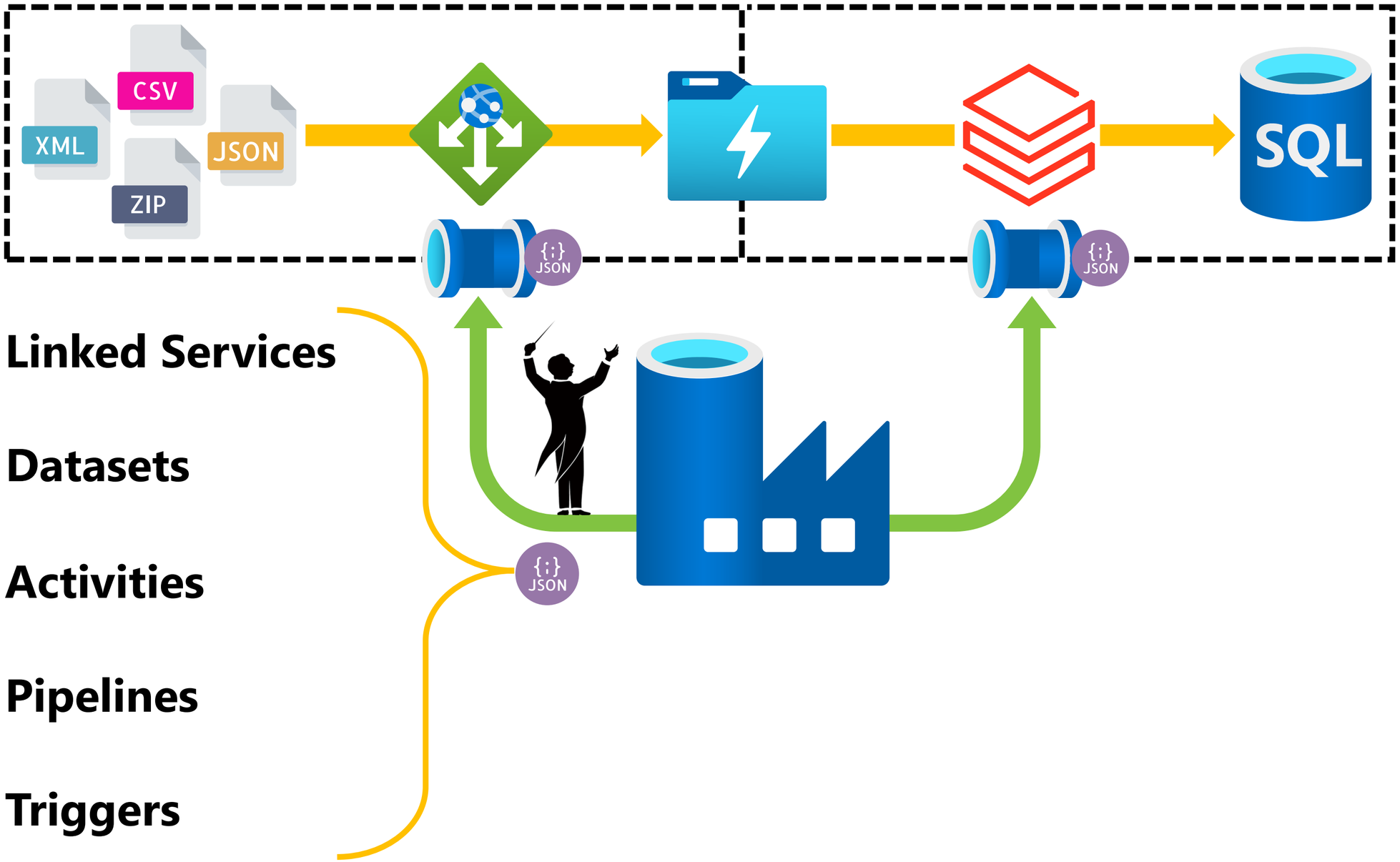
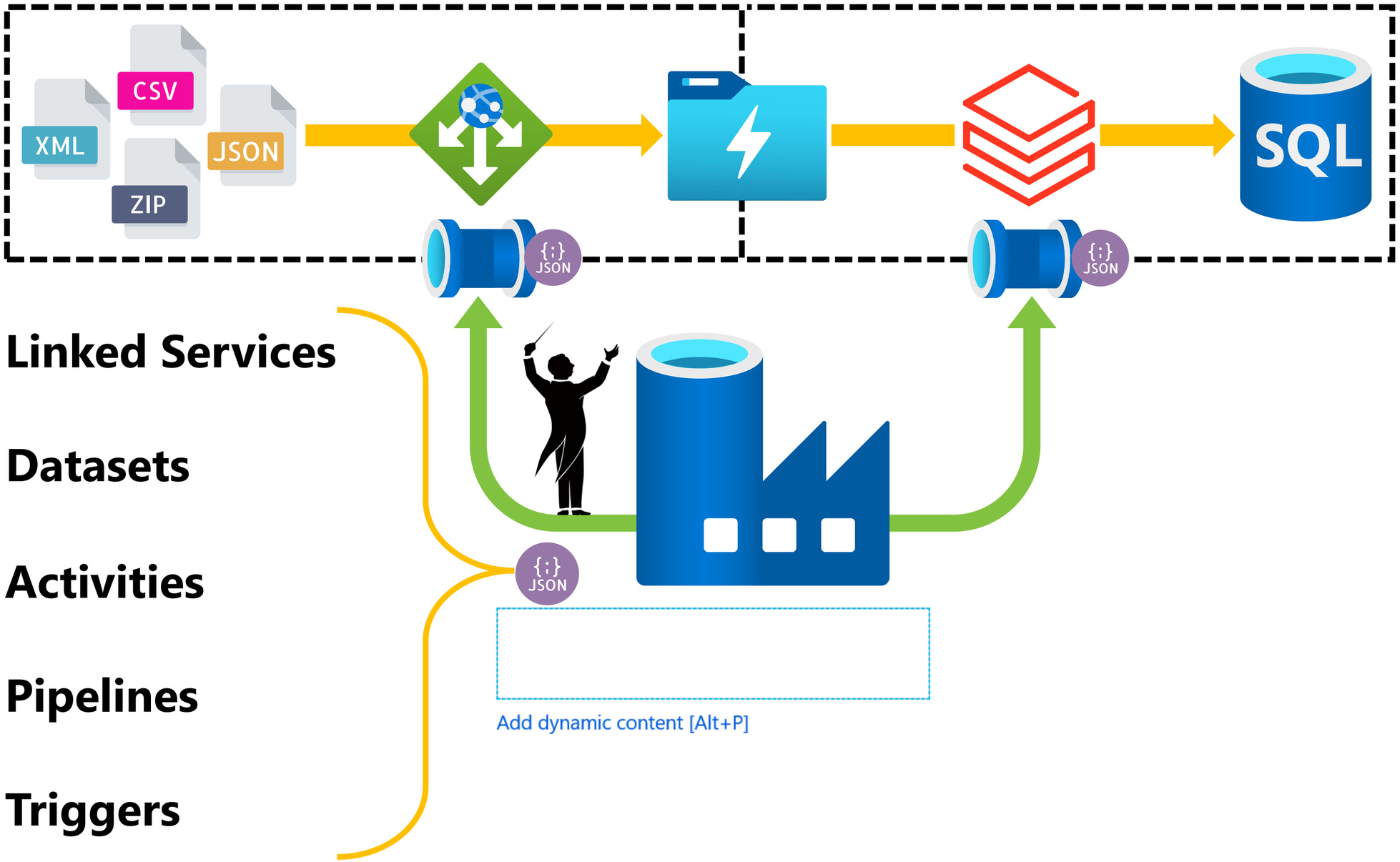
Data Factory Components



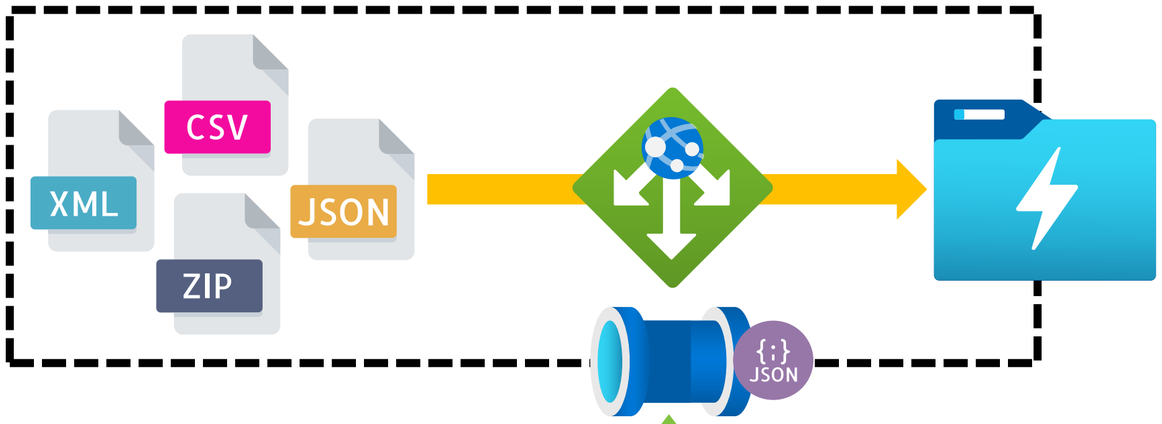
1. **Linked Services**
2. **Datasets**
3. **Activities**
4. **Pipelines**
5. **Triggers**

Data Factory Components – Add Dynamic Content



1. **Linked Services**
2. **Datasets**
3. **Activities**
4. **Pipelines**
5. **Triggers**

Control Flow Expressions



1. **Linked Services**
2. **Datasets**
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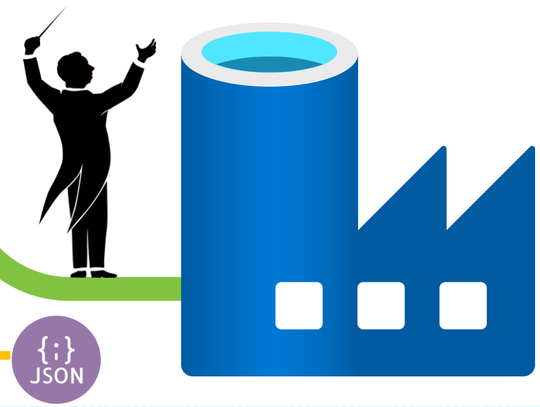


@pipeline().parameters.DemoParam

Add dynamic content [Alt+P]

Add dynamic content

@pipeline().parameters.DemoParam

Clear contents

Filter...

Use expressions, functions or refer to system variables.

▲ System variables

Data factory name
Name of the data factory the pipeline run is running within

Pipeline Name
Name of the pipeline

Pipeline run ID
ID of the specific pipeline run

Pipeline trigger ID
ID of the trigger that invokes the pipeline

Pipeline trigger name
Name of the trigger that invokes the pipeline

Pipeline trigger time
Time when the trigger that invoked the pipeline. The trigger time is the actual fired time, not the sch...

Pipeline trigger type
Type of the trigger that invoked the pipeline (Manual, Scheduler)

▲ Functions

Expand all

▷ Collection Functions

▷ Conversion Functions

▷ Date Functions

▷ Logical Functions

▷ Math Functions

▷ String Functions

https://docs.microsoft.com/en-us/azure/data-factory/control-flow-expression-language-functions

Control Flow Expressions

Save | Save as template | Validate | Debug

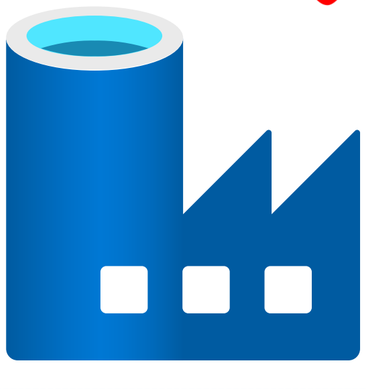
```
"SomethingDynamic": {
    "value": "@pipeline().parameters.DemoParam",
    "type": "Expression"
}
```

```
"SomethingDynamic": "@pipeline().parameters.DemoParam"
```

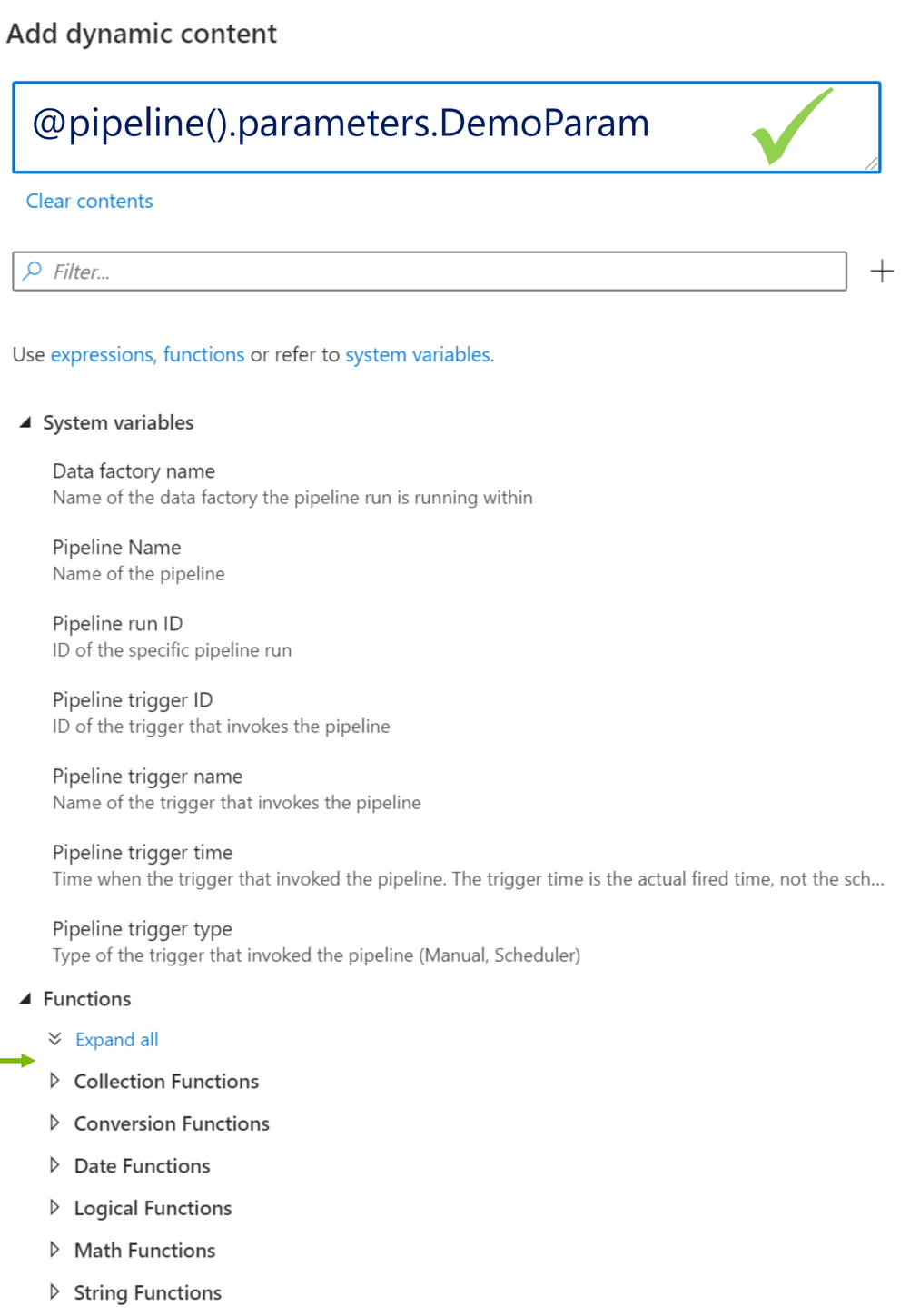
String Interpolation

```
"SomethingDynamic": "Hello World"
```

```
"parameters": {
   "DemoParam": {
   "type": "string",
   "defaultValue": "World"
}
```

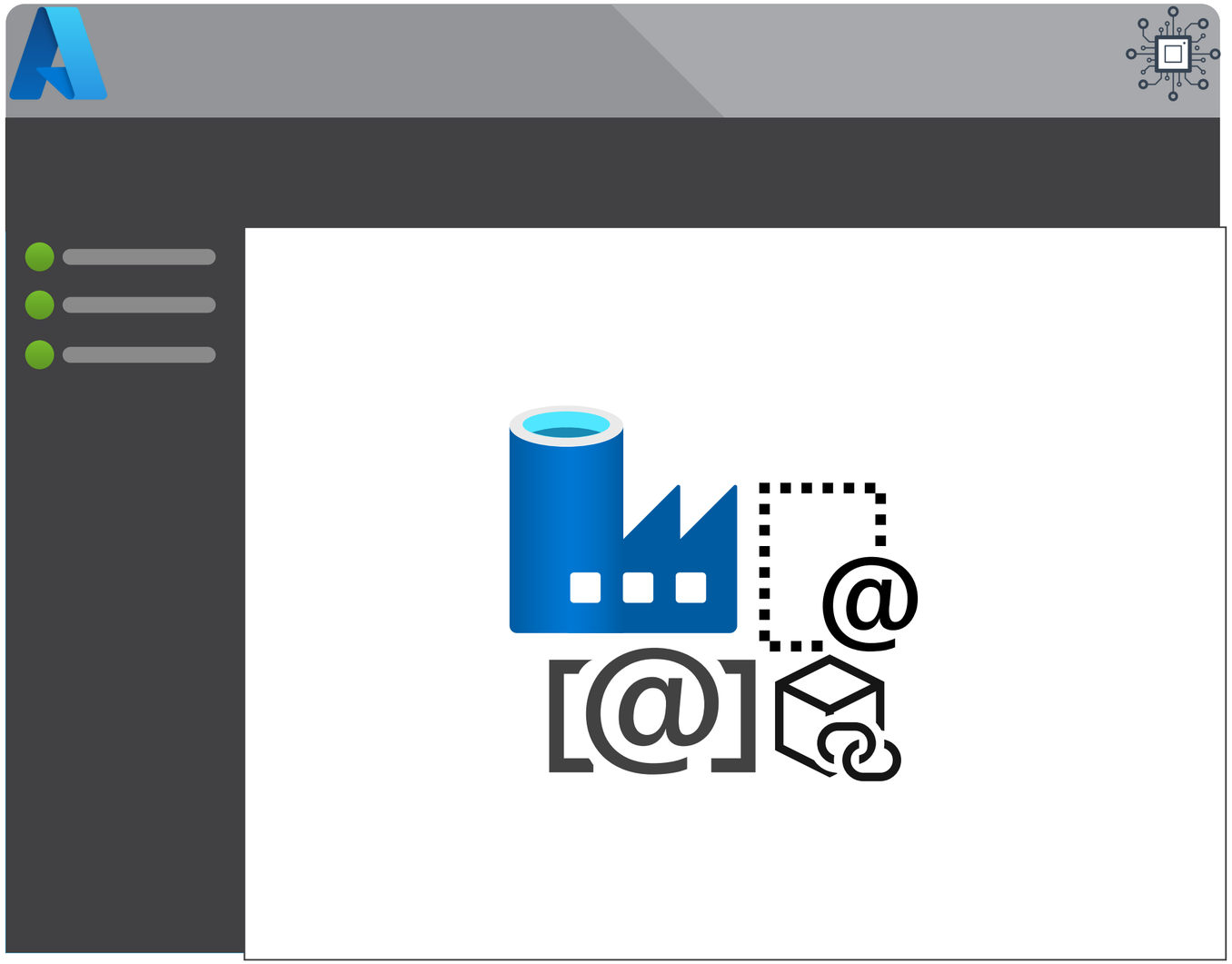



```
"SomethingDynamic": "Hello @{pipeline().parameters.DemoParam}"
```



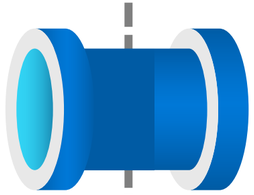
Module 4

Dynamic Pipelines

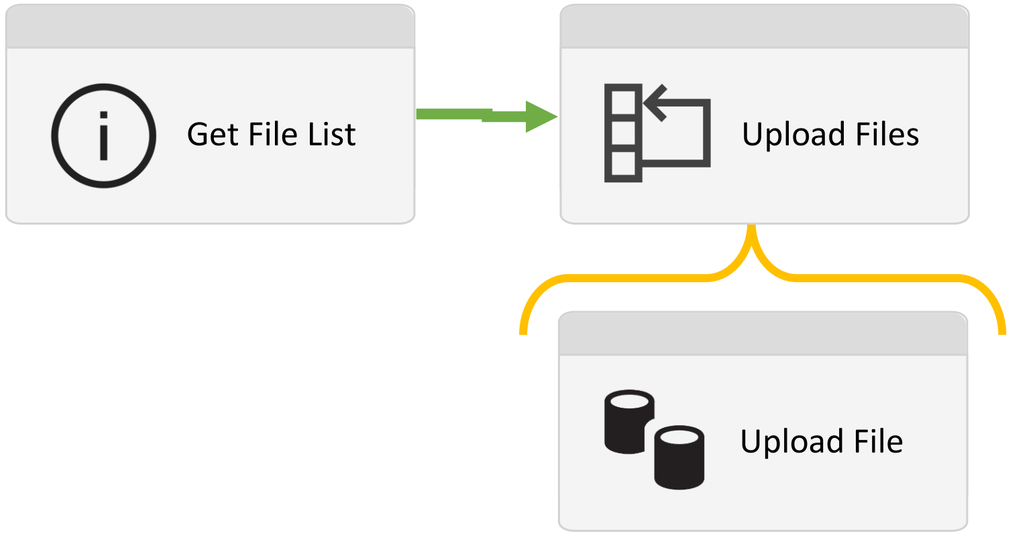


- Expressions & Interpolation
- Simple Metadata Driven Execution
  - Outputs
  - Global Parameters
  - Variables
- Dynamic Content Chains
- Reference Names

Data Discovery and Upload



@activity('Get File List')
.output.[childItems]



@item().name

Simple Metadata and Upload

Get File List

Log Upload Start

Upload Files

Upload File

Log Upload Finish

@activity('Get File List')
.output.[value]

@activity('Log Upload Start')
.output.firstRow.LogId

@item().SourceDirectory

@item().TargetDirectory

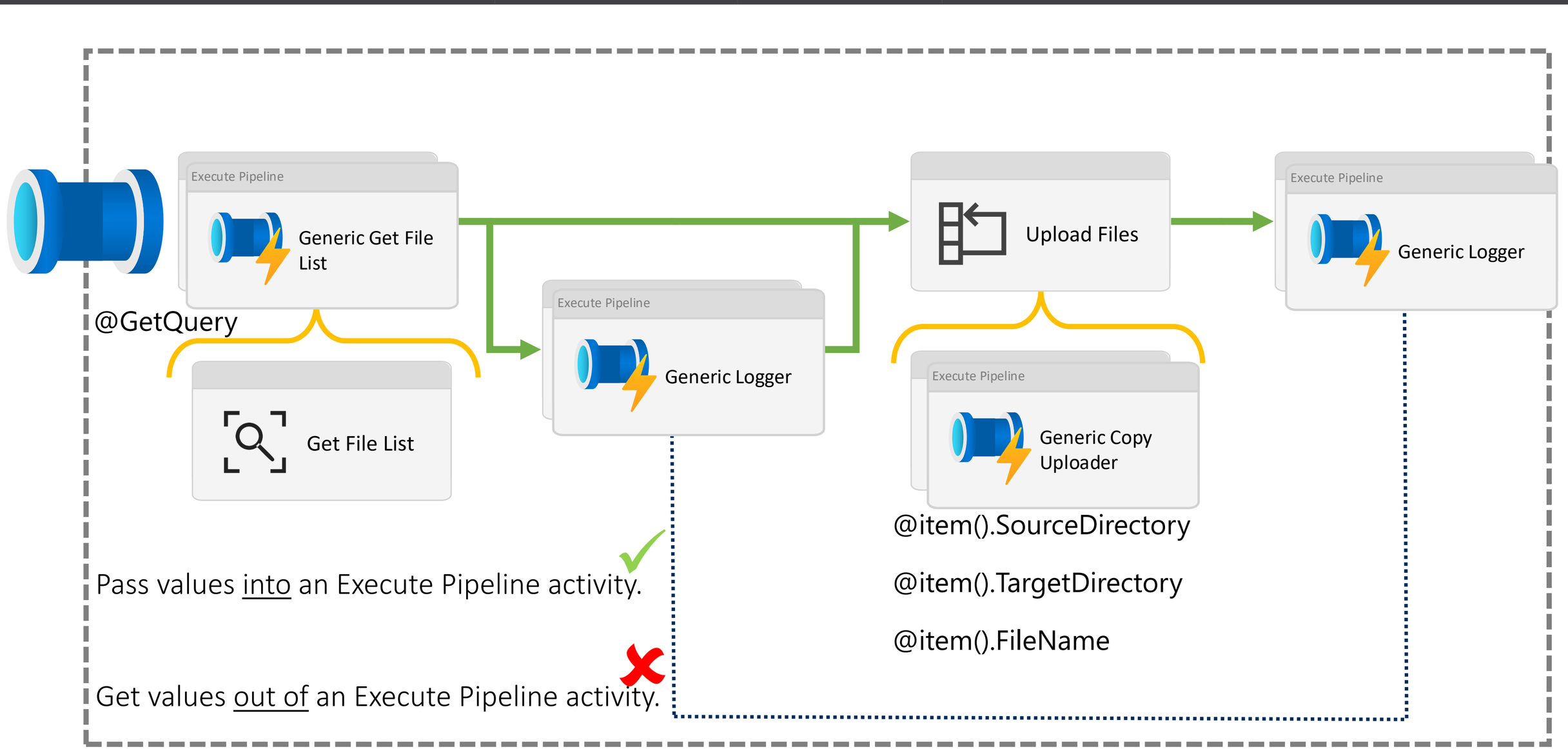
@item().FileName

Additional columns

New | Delete

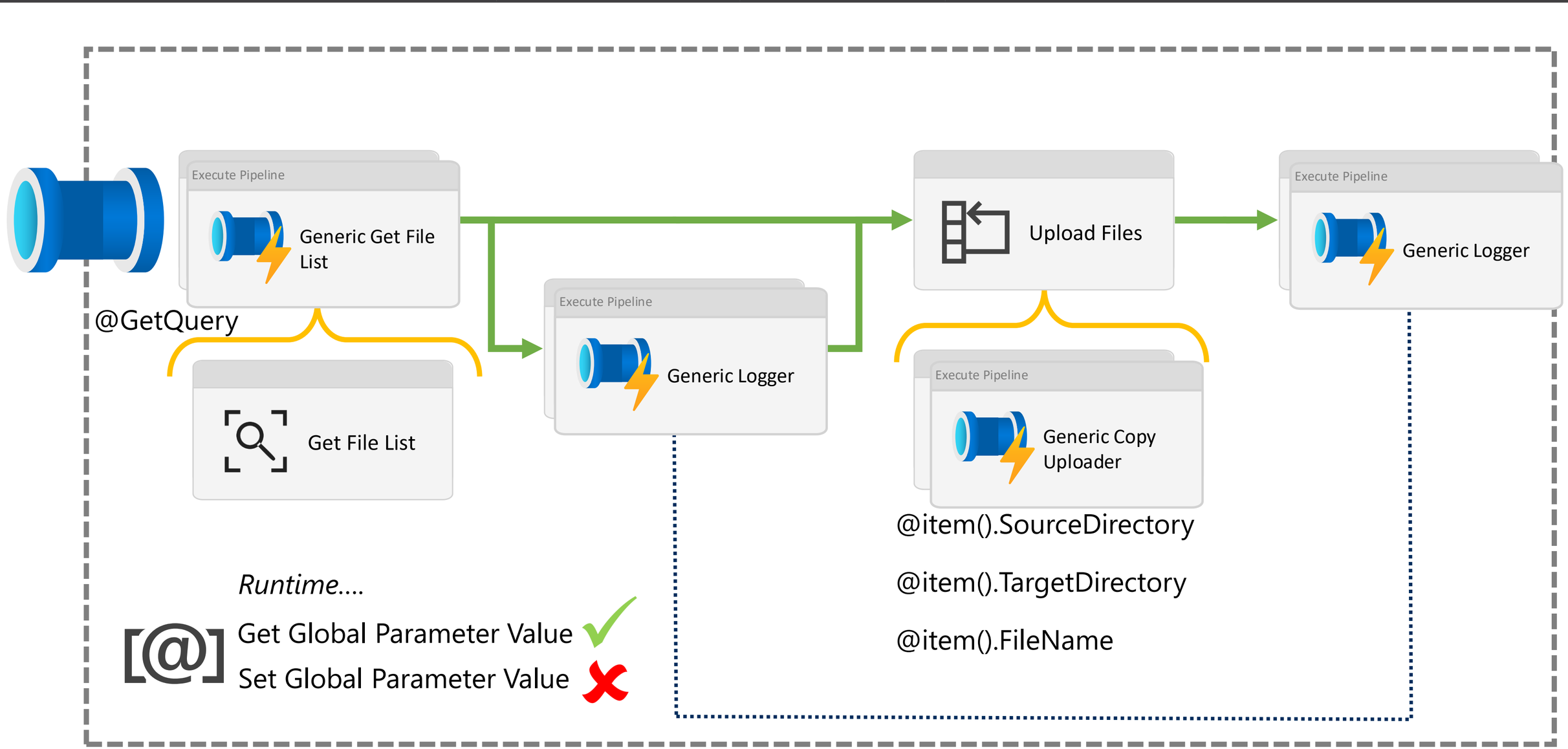
NAME	VALUE
FilePath	$$FILEPATH
DataFactoryName	@pipeline().DataFactory
PipelineName	@pipeline().Pipeline
UploadDateTime	@utcnow()
RunId	@pipeline().RunId

Using Pipelines as Worker Components



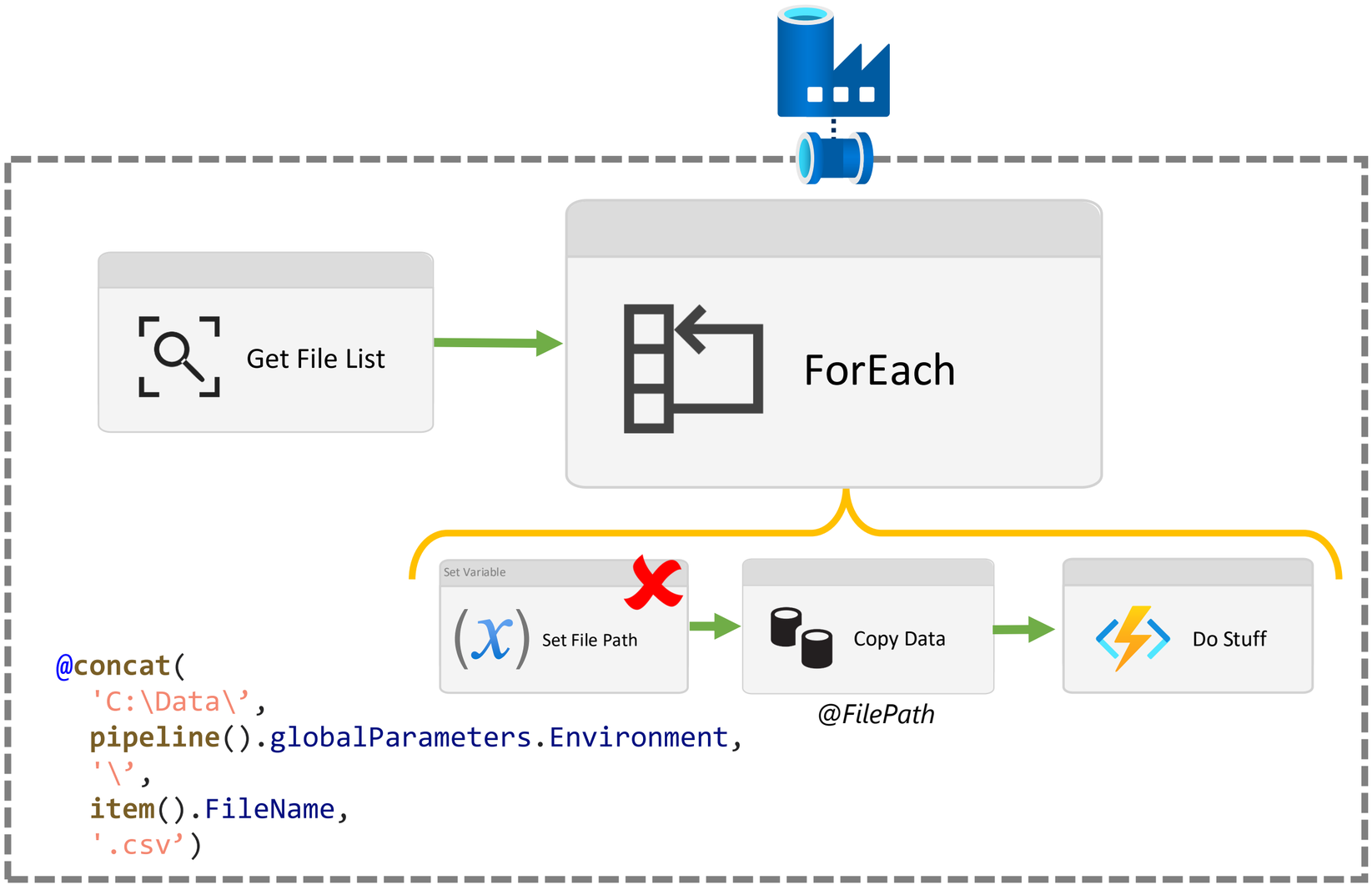
Using Pipelines as Worker Components

With a Global Parameters

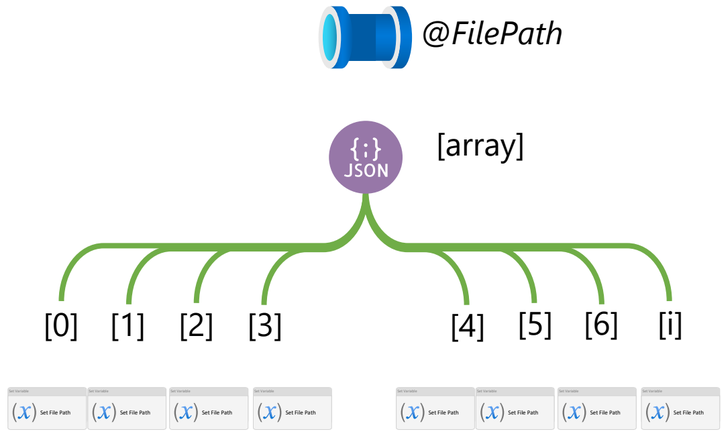


Variable Scope

Thread Safe



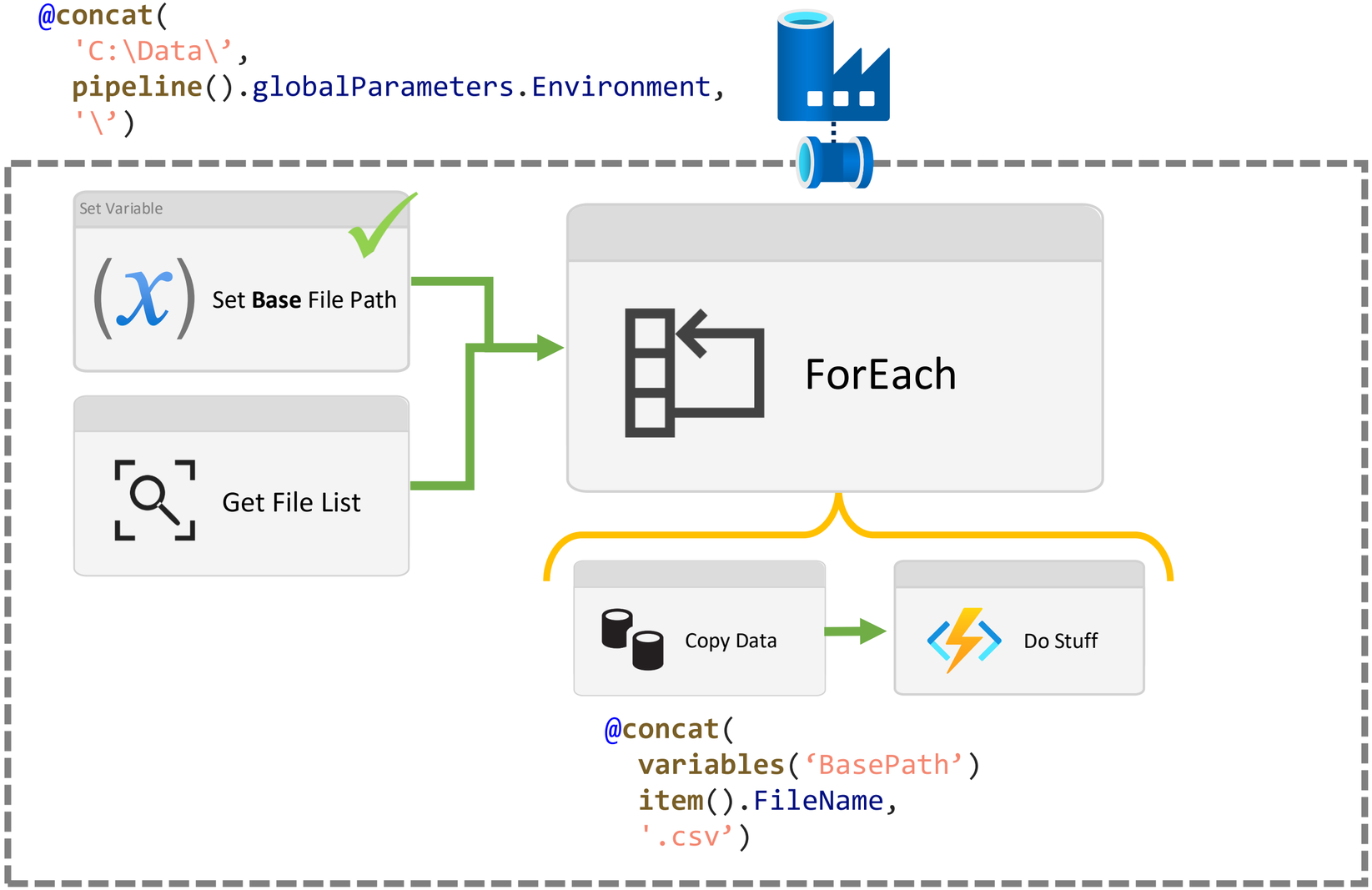

```
@concat(
   'C:\Data\',
   pipeline().globalParameters.Environment,
   '\',
   item().FileName,
   '.csv')
```



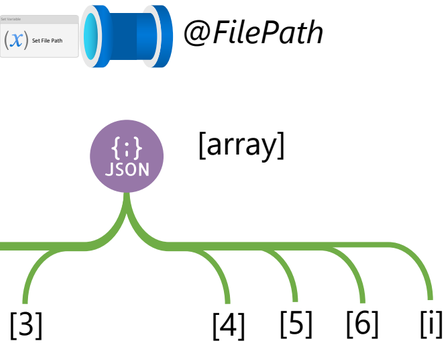
Variable Scope

Layering Expressions

```
@concat(
  'C:\Data\',
  pipeline().globalParameters.Environment,
  '\')
```




```
@concat(
  variables('BasePath')
  item().FileName,
  '.csv')
```



Demo

Module 4

Dynamic Pipelines

- Expressions & Interpolation
- Simple Metadata Driven Execution
- Dynamic Content Chains
- Reference Names

Lazy SQLDB Replication

```
SELECT s.name AS SchemaName, o.name AS TableName FROM sys.objects o
INNER JOIN sys.schemas s ON o.schema_id = s.schema_id WHERE o.[type] = 'U'
```

@pipeline().parameters.TableLookupQuery

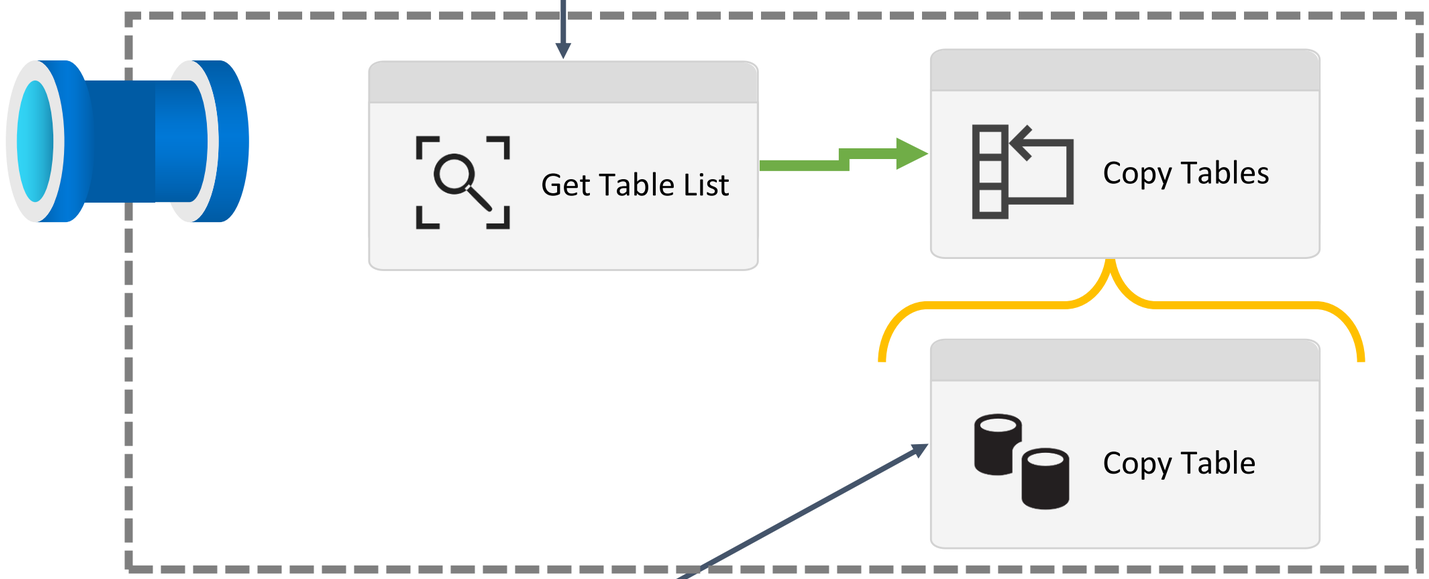


Table option ○ None ◉ Auto create table ⓘ

1x

```
IF OBJECT_ID(
                '@{item().SchemaName}.@{item().TableName}'
                ) IS NOT NULL

TRUNCATE TABLE @{item().SchemaName}.@{item().TableName}
```

1x

@pipeline().parameters.SourceConnectionSecret

@pipeline().parameters.TargetConnectionSecret

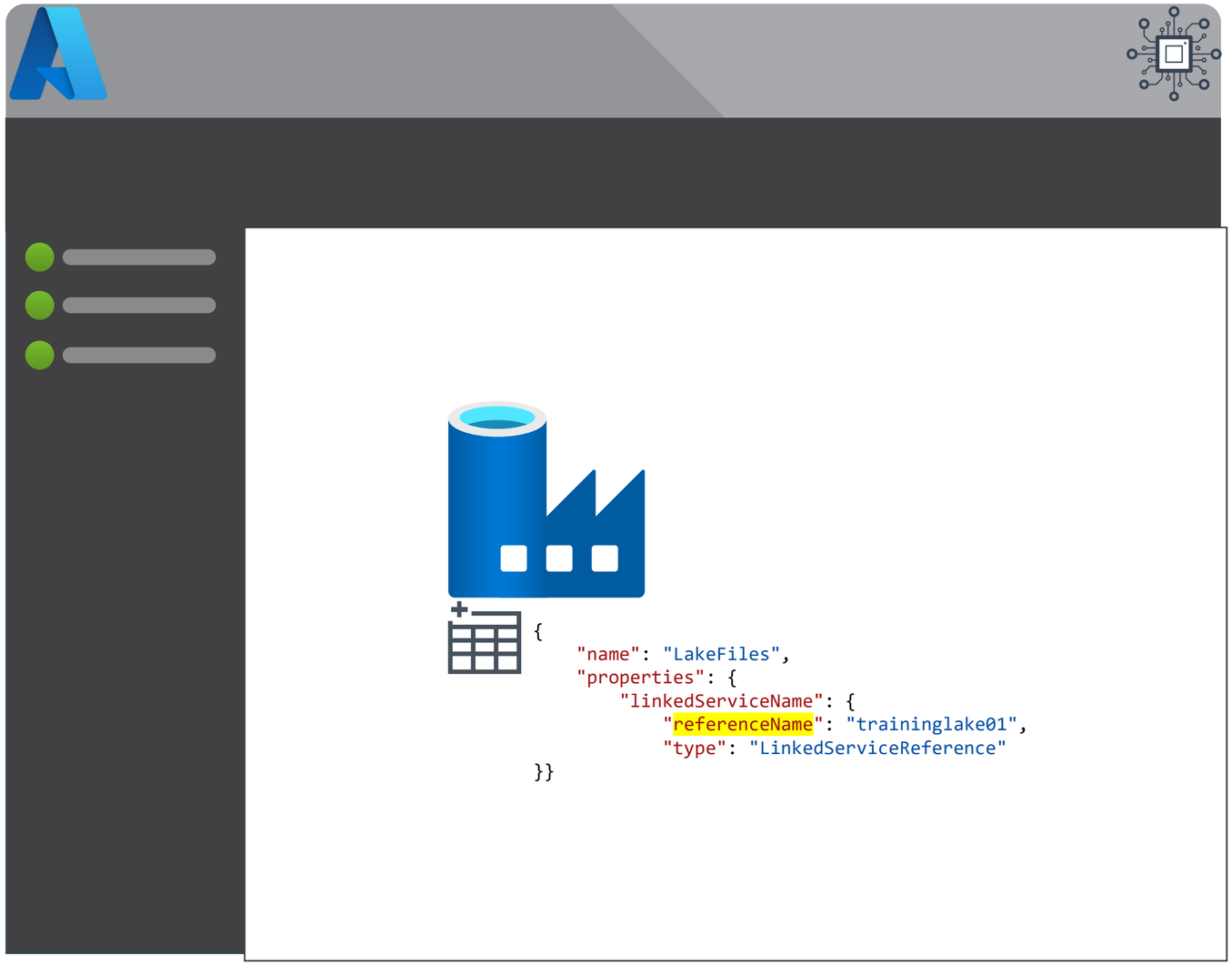
@dataset().LinkedServiceConnectionSecret

@linkedService().DBConnectionSecret

Demo

Module 4

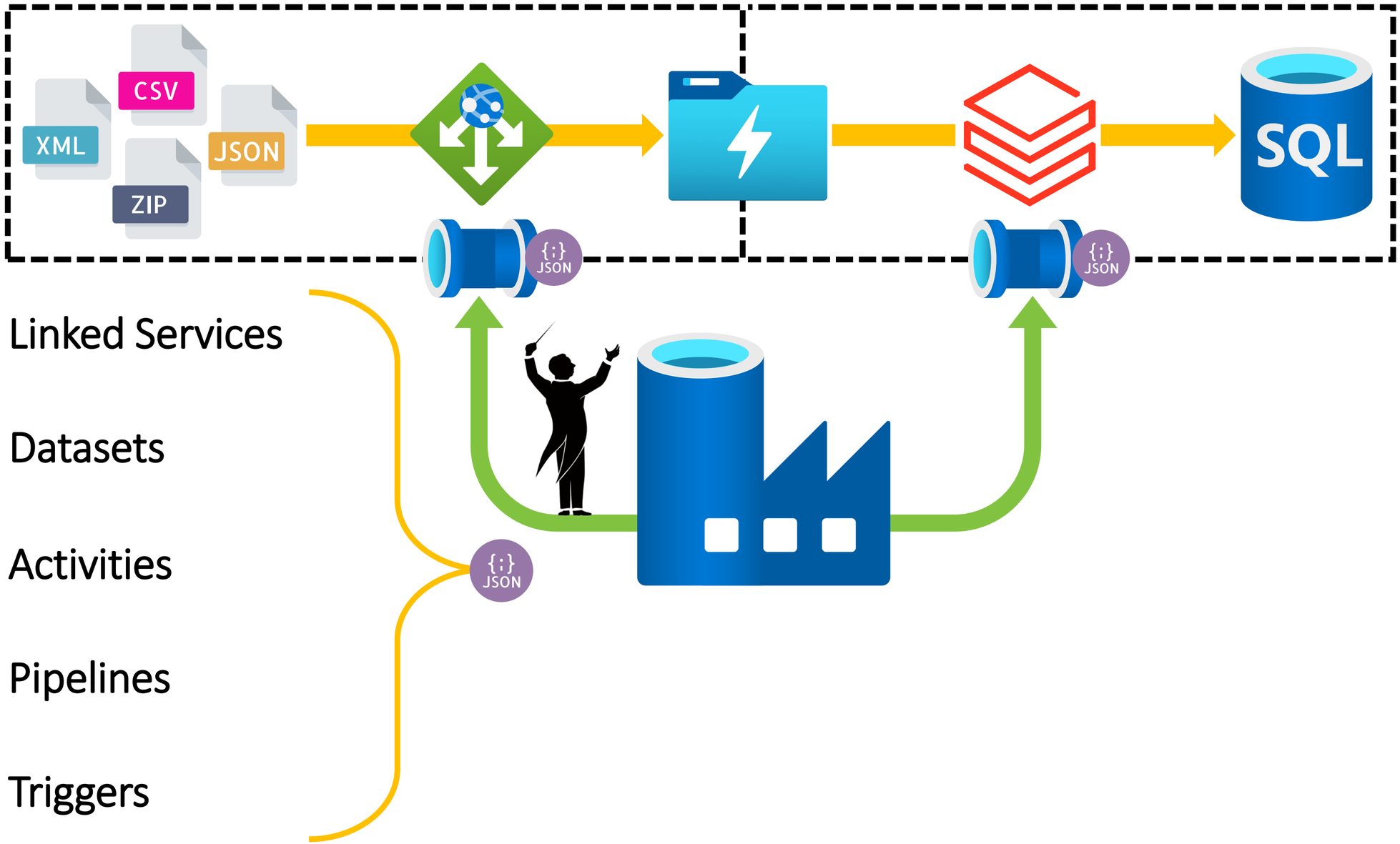
Dynamic Pipelines



```
{
    "name": "LakeFiles",
    "properties": {
        "linkedServiceName": {
            "referenceName": "traininglake01",
            "type": "LinkedServiceReference"
}}
```

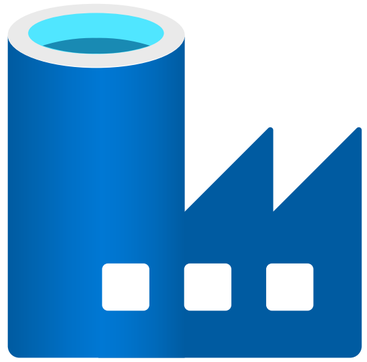
- Expressions & Interpolation
- Simple Metadata Driven Execution
- Dynamic Content Chains
- Reference Names

Reference Names



1. Linked Services
2. Datasets
3. Activities
4. Pipelines
5. Triggers

Reference Names



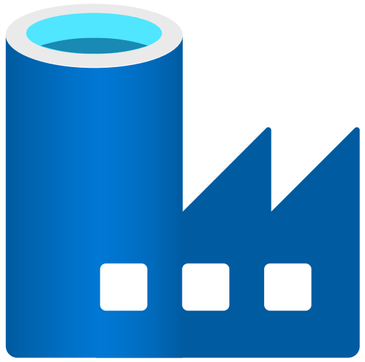
1. Linked Services
2. Datasets
3. Activities
4. Pipelines
5. Triggers

```
{
    "name": "TrainingKeys01",
    "type": "Microsoft.DataFactory/factories/linkedservices",
    "properties": {
        "annotations": [],
        "type": "AzureKeyVault",
        "typeProperties": {
            "baseUrl": "https://TrainingKeys01.vault.azure.net/"
}}}
```

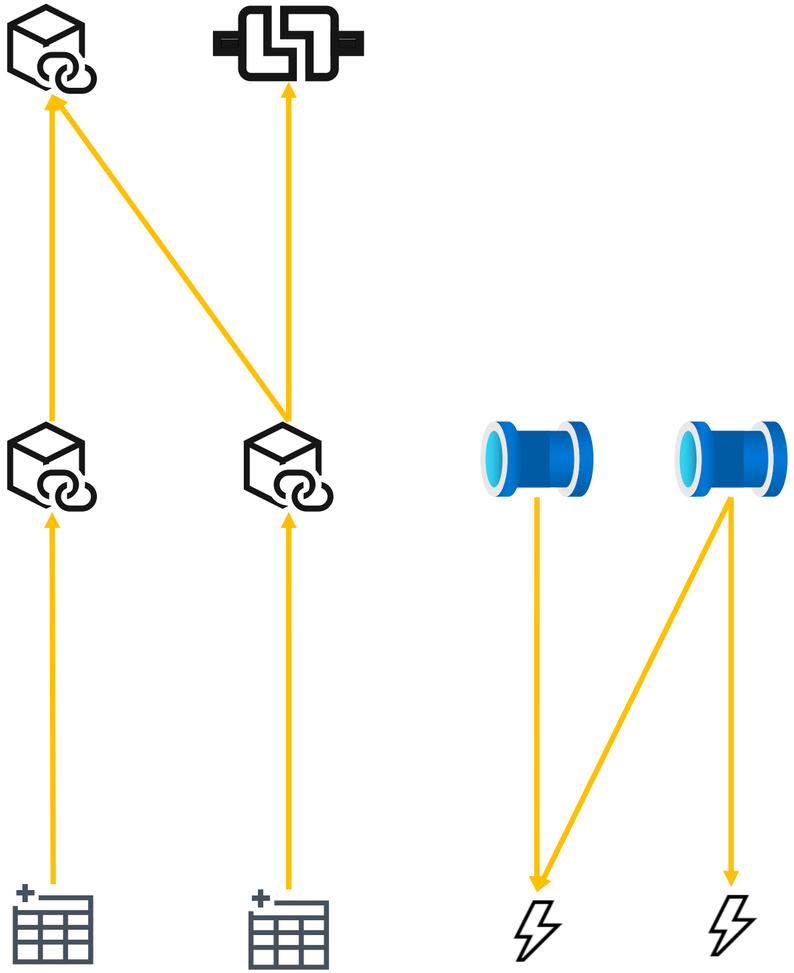
```
{
    "name": "trainglake01",
    "properties": {
        "typeProperties": {
            "accountKey": {
                "type": "AzureKeyVaultSecret",
                "store": {
                    "referenceName": "TrainingKeys01",
                    "type": "LinkedServiceReference"
}}}}}
```

```
{
    "name": "LakeFiles",
    "properties": {
        "linkedServiceName": {
            "referenceName": "trainglake01",
            "type": "LinkedServiceReference"
}}
```

Reference Names



1. Linked Services {:} JSON
2. Datasets {:} JSON
3. Activities {:} JSON
4. Pipelines {:} JSON
5. Triggers {:} JSON



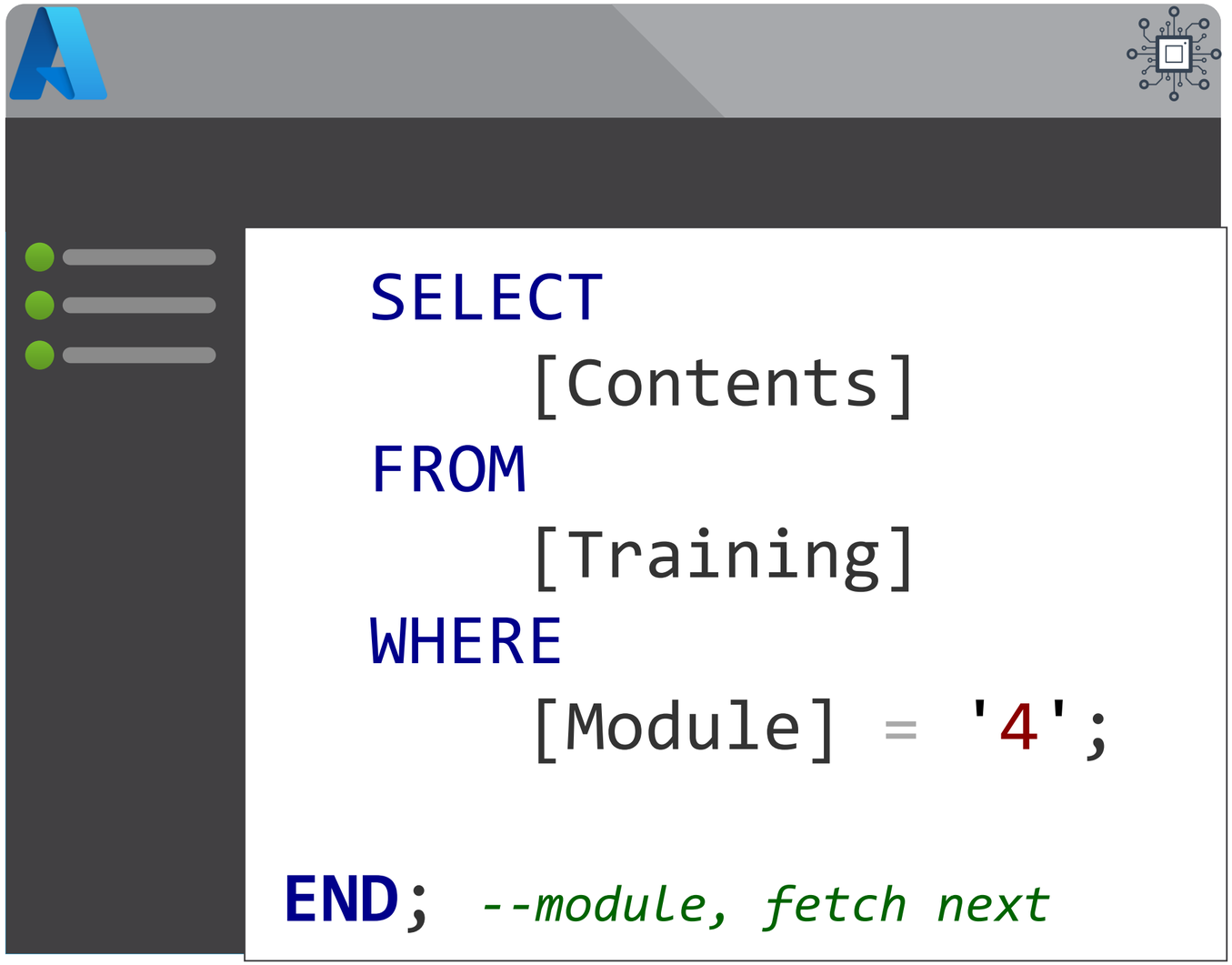
Reference Names **cannot** be dynamic.

- Not at development time.
- Note at runtime.
- At deployment time if <u>being careful</u>.

They are used internally by Data Factory to validate artifact dependencies.

Module 4

Dynamic Pipelines



```
    SELECT
        [Contents]
    FROM
        [Training]
    WHERE
        [Module] = '4';


END; --module, fetch next
```

- Expressions & Interpolation
- Simple Metadata Driven Execution
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- Reference Names