

# Cognitive Services in ADLA:

Cognitive capabilities for U-SQL enable developers to use put intelligence in their big data programs. The overall process is simple:

- Use the REFERENCE ASSEMBLY statement to enable the cognitive features for the U-SQL Script
- Call the PROCESS operation to use the Cognitive capabilities

## Imaging scenarios

### Example: Image tagging

The following example shows an end-to-end use of the imaging capabilities to detect objects in images.

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```
REFERENCE ASSEMBLY ImageCommon;
REFERENCE ASSEMBLY FaceSdk;
REFERENCE ASSEMBLY ImageEmotion;
REFERENCE ASSEMBLY ImageTagging;
REFERENCE ASSEMBLY ImageOcr;

@imgs =
    EXTRACT FileName string, ImgData byte[]
    FROM @"/images/{FileName:*.jpg}"
    USING new Cognition.Vision.ImageExtractor();

// Extract the number of objects on each image and tag them
@objects =
    PROCESS @imgs
    PRODUCE FileName,
        NumObjects int,
        Tags string
    READONLY FileName
    USING new Cognition.Vision.ImageTagger();
```

## Extract emotions from human faces

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```
@emotions =  
    PROCESS @imgs  
    PRODUCE FileName string,  
            NumFaces int,  
            Emotion string  
    READONLY FileName  
    USING new Cognition.Vision.EmotionAnalyzer();
```

## Estimate age and gender for human faces

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```
@faces =  
    PROCESS @imgs  
    PRODUCE FileName,  
            NumFaces int,  
            FaceAge string,  
            FaceGender string  
    READONLY FileName  
    USING new Cognition.Vision.FaceDetector();
```

## Detect text in Images (OCR)

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```
@ocrs =  
    PROCESS @imgs  
    PRODUCE FileName,  
            Text string  
    READONLY FileName  
    USING new Cognition.Vision.OcrExtractor();
```

## Text scenarios

## Input data

Assume that we have an input that consists of "War and Peace" by Leo Tolstoy.

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```
REFERENCE ASSEMBLY [TextCommon];
REFERENCE ASSEMBLY [TextSentiment];
REFERENCE ASSEMBLY [TextKeyPhrase];

@WarAndPeace =
    EXTRACT No int,
            Year string,
            Book string,
            Chapter string,
            Text string
    FROM @"/usqlxet/samples/cognition/war_and_peace.csv"
    USING Extractors.Csv();
```

## Extract key phrases for each paragraph

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```
@keyphrase =
    PROCESS @WarAndPeace
    PRODUCE No,
            Year,
            Book,
            Chapter,
            Text,
            KeyPhrase string
    READONLY No,
            Year,
            Book,
            Chapter,
            Text
    USING new Cognition.Text.KeyPhraseExtractor();

// Tokenize the key phrases.
@kpsplits =
    SELECT No,
            Year,
            Book,
            Chapter,
```

```
Text,  
T.KeyPhrase  
FROM @keyphrase  
CROSS APPLY  
    new Cognition.Text.Splitter("KeyPhrase") AS T(KeyPhrase);
```

## Perform sentiment analysis on each paragraph

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```
@sentiment =  
    PROCESS @WarAndPeace  
    PRODUCE No,  
        Year,  
        Book,  
        Chapter,  
        Text,  
        Sentiment string,  
        Conf double  
    READONLY No,  
        Year,  
        Book,  
        Chapter,  
        Text  
    USING new Cognition.Text.SentimentAnalyzer(true);
```