Microsoft

Data CodeLabs Module 3 – Machine Learning & Cognitive Services APIs

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#Build2016

Instructions at:
http://aka.ms/codelabsdata

Click on **Module 3**

Key Takeaways

Introduction to Cognitive Services

Understand how to integrate Machine Learning based capabilities into your application

Recommendations API

Train your own model and serve product recommendations.

Text Analytics API

Analyze unstructured text to understand sentiment and key phrases / topics

Emotion API

Learn how to use Microsoft Cognitive Services Emotion API.
Get guidance on how to get started with other Cognitive Services APIs.

Batteries   Oil   Brakes   Lighting   Wheels & Tires   More

New Arrival : Halogen Headlights (2 Pack)

12-Volt Calcium Battery

USD $129.99

In Stock (Ships 1-3 days)

Description

Calcium is the most common battery type. It is durable and has a long shelf and service life. They also provide high cold cranking amps.

Type	Calcium
Volts	12
Weight	22.9 lbs
Size	7.7x5x8.6
Cold Cranking Amps	510

ADD TO CART

You may also consider

Jumper Leads $16.99	**Wheel Tire Combo (4 Pack)** $219.99	**Oil and Filter Combo** $34.49	**Turn Signal Light Bulb** $6.49
Matte Finish Rim $75.99	**High Performance Rim** $99.99	**Blue Performance Alloy Rim** $88.99	**Spiral Coil Battery** $154.99

Site Menu

Home
Browse

Account

Manage Account
Shopping Cart

Additional Info

Privacy Policy
Terms and Conditions

Develop

GitHub Source
License Agreement
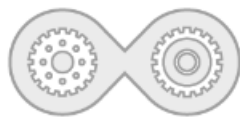
Parts Unlimited
a Fabrikam subsidiary

Batteries   **Oil**   **Lighting**   **Wheels & Tires**   **Brakes**   **More**

New Arrival : Halogen Headlights (2 Pack)

Your feedback matters

Thanks for your kind feedback!

KEEP SHOPPING

Sentiment score:

97%

Key Phrases:

- nice rims excellent price

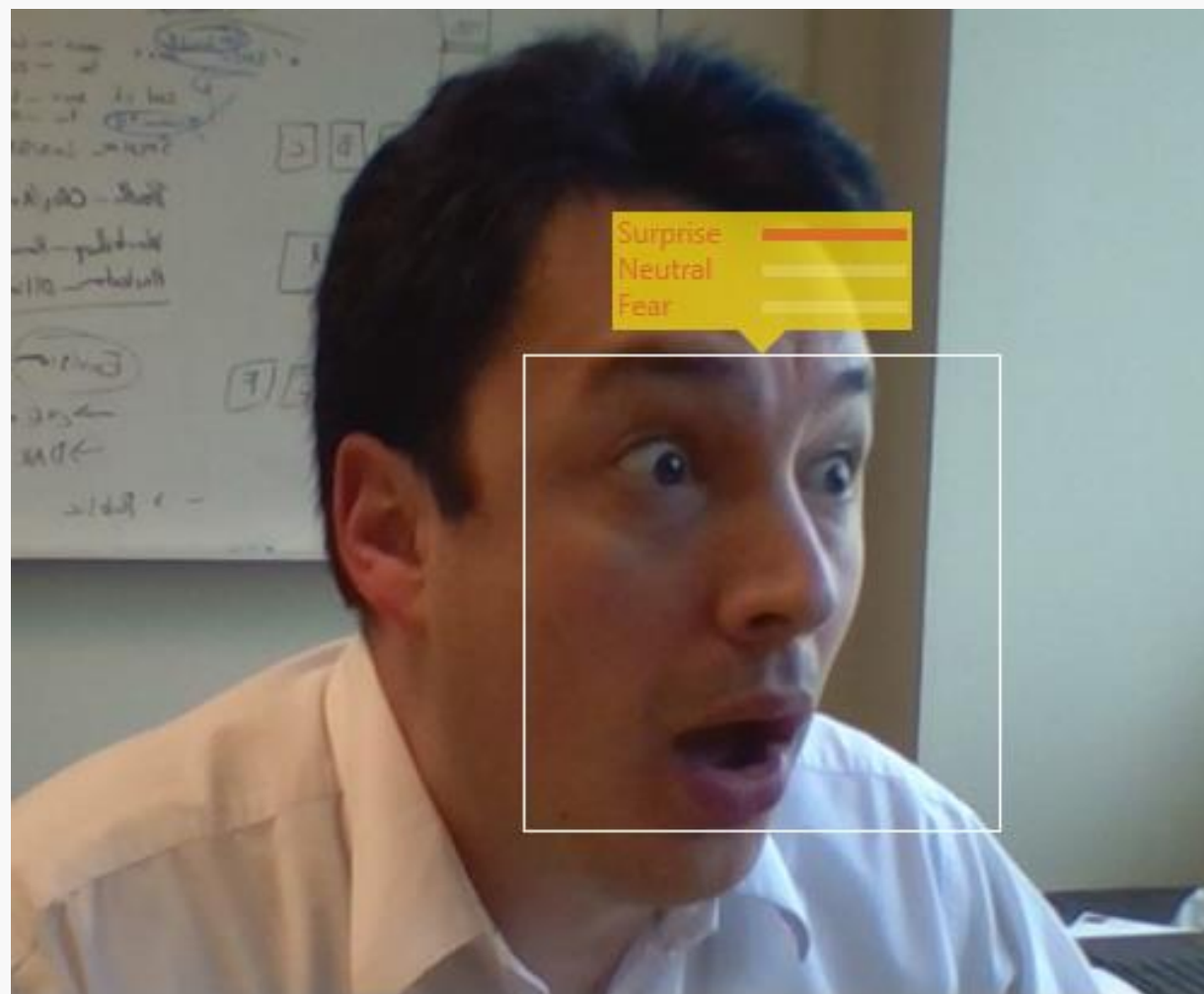| Site Menu	Account	Additional Info	Develop
Home	Manage Account	Privacy Policy	GitHub Source
Browse	Shopping Cart	Terms and Conditions	License Agreement

Exercise 1

Recommendations API

Task 0 – First things first...

- Go to c:\CodeLabs-Data\Module3...**Source** folder.

- Right-click **Setup.cmd** and select **Run as administrator** to configure environment and install Visual Studio code snippets.

- Open the **PartsUnlimited** solution located at ...\Module3...**Source\Ex1\Begin\PartsUnlimited**

- If prompted to install a new DNX version, say **OK**.

Recommendations

Increase catalog discovery
Help customers easily discover items that they may be interested in

Personalize your experience
Show suggestions that are targeted to each specific user

Increase the bottom line
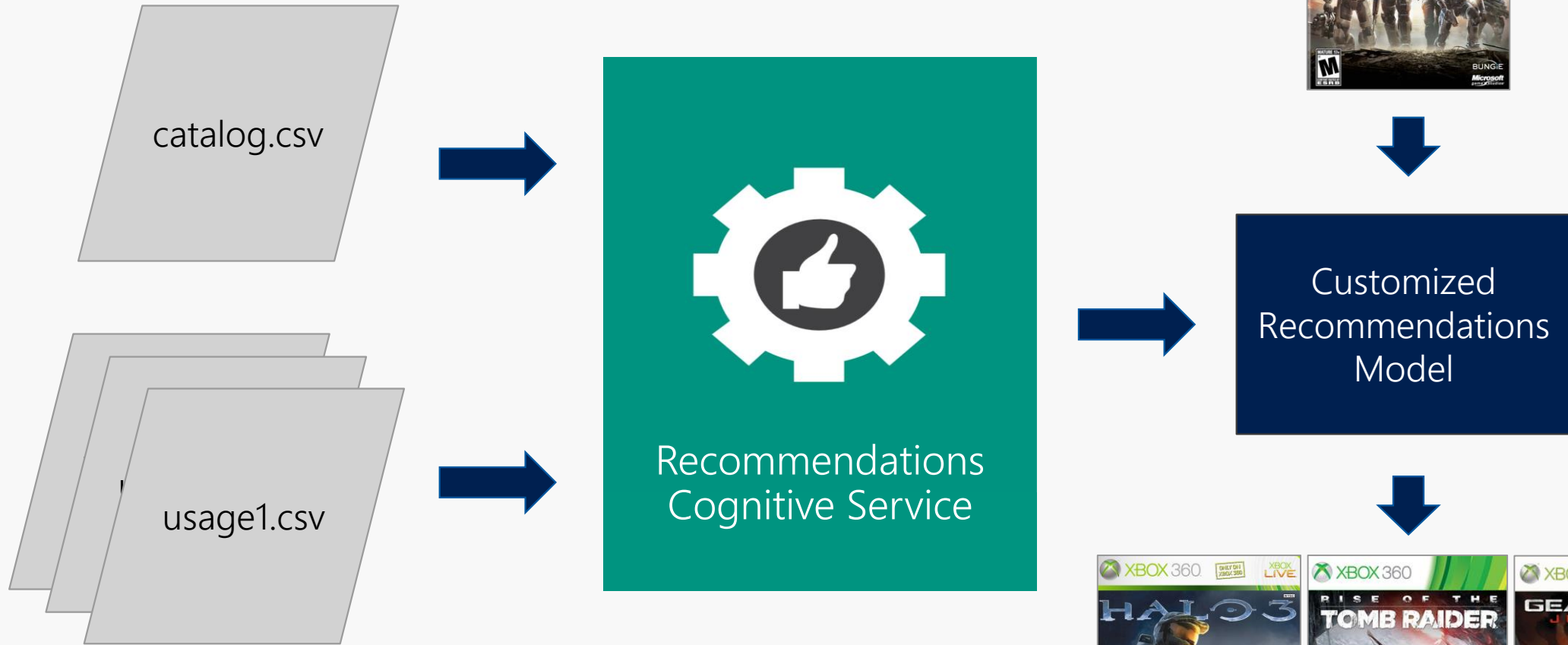Increase your conversion rate by offering the right products at the right time

Customized
Recommendations
Model

PID890, Halo 3, Xbox 360 Games

catalog.csv

usage1.csv

Recommendations
Cognitive Service

Customized
Recommendations
Model

USERID-35, PID890, 2014/12/31T20:21:26, Purchase

Task 1 – Signing up for the service

Let's **skip** this step for now...

Just go get the API key from
http://aka.ms/codelabsdata

Task 2.1 – Creating a model (Client UI)

1. Go to http://recommendations.azurewebsites.net
2. Log in with **username/API key**
3. Create a new Project. Use your *UserName* for now.
4. Upload catalog
5. Upload usage
6. Build!

Files at: c:\CodeLabs-Data\Module3-MachineLearning\
Source\Ex1\Begin\RecommendationsSample\Resources

Task 2.2 – Let's take a look at the Sample...

1. Let's look at the catalog and usage files
2. Let's walk through the sample...

Solution at: <root path>**Module3**-MachineLearning\
Source\Ex1\Begin\RecommendationsSample

Did our model finish building?

1. Go back to the UI
2. Actually score an item or two.
3. Click **Score**
4. Select an item, you will see the recommendations for that item.

Task 3 – Updating your website to consume recommendations

1. Did your website finish loading?
2. Let's add the information needed to consume the model: **API Key**, **account ID** and **Model Id**.
   (We can get the model Id from the client UI)
3. Let's take a look at AzureMLRecommendationsEngine.cs
4. Debug (Hit **F5)**
5. Select an item, you will see the recommendations for that item.

Now as part of Cognitive Services on Azure!

Let me show you how it works on Azure Portal…

(Task 1:We'll skip sign up, use same API Key as the previous exercise)

■ Microsoft

Cognitive Services

My account 🧑

Home APIs ⌄ Applications Developers ⌄ Pricing

Give your apps a human side

Knock down barriers between you and your ideas. Enable natural and contextual interaction with tools that augment users' experiences via the power of machine-based AI. Plug them in and bring your ideas to life.

Get started for free today

Put intelligence APIs to work

Microsoft Cognitive Services let you build apps with powerful algorithms using just a few lines of code. They work across devices and platforms such as iOS, Android, and Windows, keep improving, and are easy to set up.

Get started   Background reading   APIs in action

Exercise 2

Text Analytics API

Text Analytics

Sentiment analysis
Understand if a record has positive or negative sentiment.

Key phrase extraction
Extract key phrases from a piece of text, and retrieve topics.

Topic detection
Use clustering techniques to identify the trending topics on a large set of text records.

Language detection
Identify the language, 120 supported languages.

Task 2

On PartsUnlimited solution (same as previous exercise):

1. On **PartsUnlimitedWebsite/config.json** Enter AccountKey for text analytics.

- Insert snippet at Views\ Store\ **Details.cshtml**

```
@using (Html.BeginForm("Feedback", "Store"))
{
        <section>
                <h2>Feedback</h2>
                <div class="row">
                        <div class="col-sm-12 col-md-6 wide-col-padding no-gutter-xs">
                                <div class="col-xs-12  no-gutter-sm">
                                        <p>We'd love to know your thoughts on this product</p>
                                </div>
                                <div class="form-group col-sm-8 col-md-10 no-gutter-sm">
                                        @Html.TextBox("feedback", null, new { @class = "form-control", placehold
                                </div>

                                <div class="col-md-12 no-gutter-sm">
                                        <input id="feedback-button" type="submit" value="Submit Feedback" />
                                </div>

                        </div>
                </div>
        </section>
}
```

Task 2

- Insert Snippet at Controllers**StoreController.cs**

```csharp
public async Task<IActionResult> Feedback([FromForm]string feedback)
{
    // get sentiment
    var sentimentResult = await textAnalyticsService.GetSentiment(feedback);

    // get key phrases
    var phrases = await textAnalyticsService.GetKeyPhrases(feedback);

    var score = new Feedback() { Score = sentimentResult.Score, KeyPhrases = phrases.KeyPhrases };
    return View(score);
}
```

Task 2

- Insert snippet at Views\ Store\ **Feedback.cshtml**

```
@using PartsUnlimited
@model PartsUnlimited.Models.Feedback

@{
ViewBag.Title = $"Your feedback matters";
}

<section>
<div>
    <h2>Your feedback matters</h2>
    <div class="row">

        @if (@Model.Score < 0.5)
        {
                    <div class="col-sm-12">
                        <h4 style="color:red">So sorry for your experience. We are constantly workin
                        <div>
                            @Html.ActionLink("Keep Shopping", "Index", "Home", null, new { @clas
                        </div>
                    </div>
        }
        else
        {
                    <div class="col-sm-12">
                                    ...
                        <h4 style="color:green">Thanks for your kind feedback!</h4>
```

Parts Unlimited
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Keyword

Search   Home   Cart   Log in

Batteries   **Oil**   **Brakes**   **Lighting**   **Wheels & Tires**   **More**

📢 *New Arrival : Halogen Headlights (2 Pack)*

Turn Signal Light Bulb

USD $6.49

In Stock (Ships 1-3 days)

Description

Clear bulb that with a universal fitting for all headlights/taillights. Simple Installation, low wattage and a clear light for optimal visibility and efficiency.

Color	Clear
Fit	Universal
Wattage	30 Watts
Includes Socket	Yes

ADD TO CART

Feedback

We'd love to know your thoughts on this product

Feedback

SUBMIT FEEDBACK

Great job!

Now you can close the PartsUnlimited solution

Exercise 3

Face and Emotion API

Face APIs

Face detection
Detect faces and their attributes within an image

Face verification
Check if two faces belong to the same person

Similar face searching
Find similar faces within a set of images

Face grouping
Organize many faces into groups

Face identification
Search which person a face belongs to

Emotion APIs

Recognize emotions
Detect emotions based on facial expressions in photos and videos

Task 1

- Sign up for a free key at:

http://portal.azure.com

<username>@build16.onmicrosoft.com

+New > Intelligence > Cognitive Service APIs
API Type: **Emotions API**

…

Task 2: Create Universal Windows App

- Start **Visual Studio 2015** and create a new project **File > New Project...**

- In the installed templates tree, navigate to **Visual C# > Windows > Universal** and select the template **Blank App (Windows Universal)**.

- Enter the name *MyRetailKioskApp*.

…
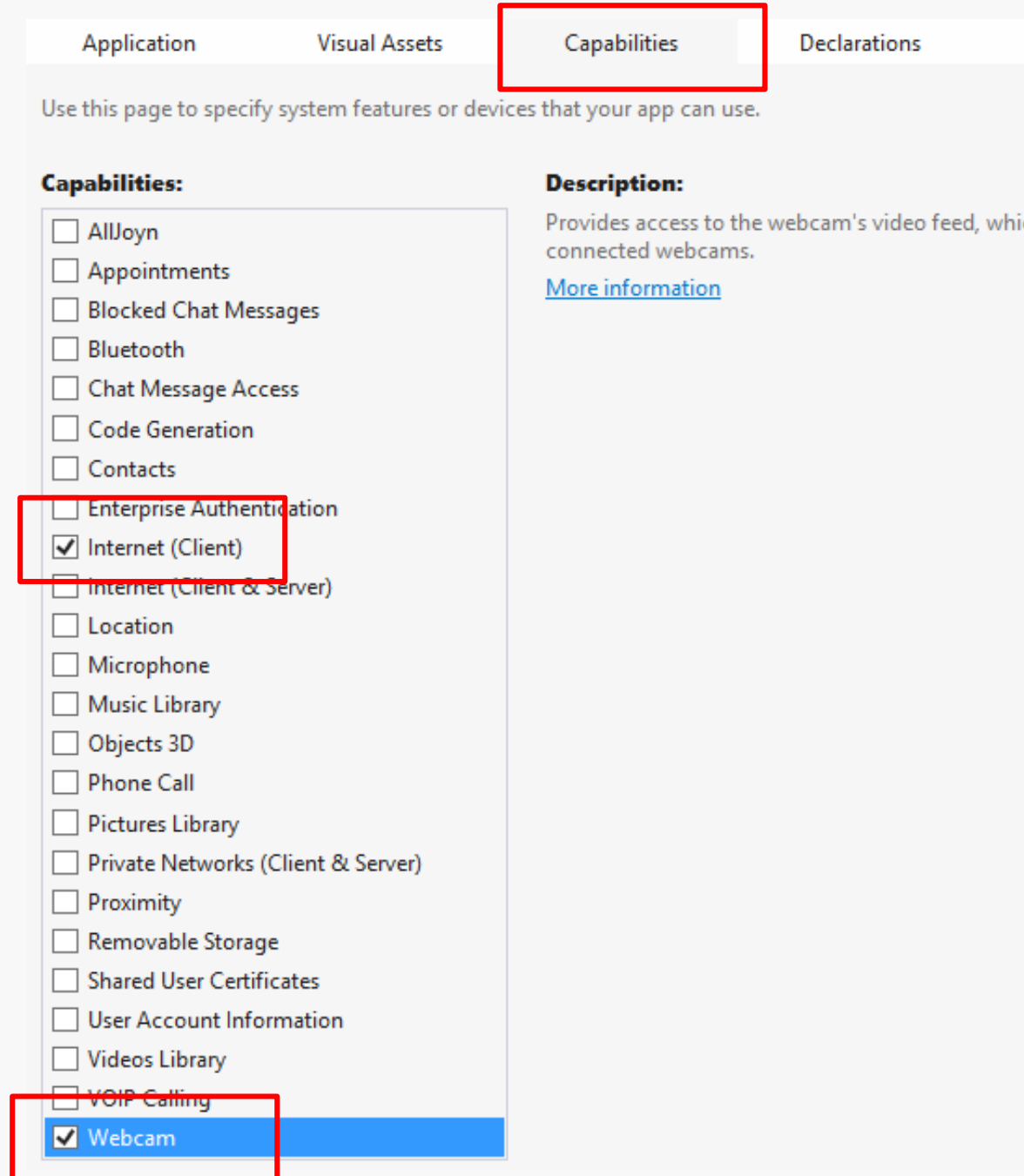
Task 2.4

- **Tools > Nuget Package Manager > Manage NuGet Packages for Solution**

- In the NuGet Package Manager window, search for **Microsoft.ProjectOxford.Emotion** and install it
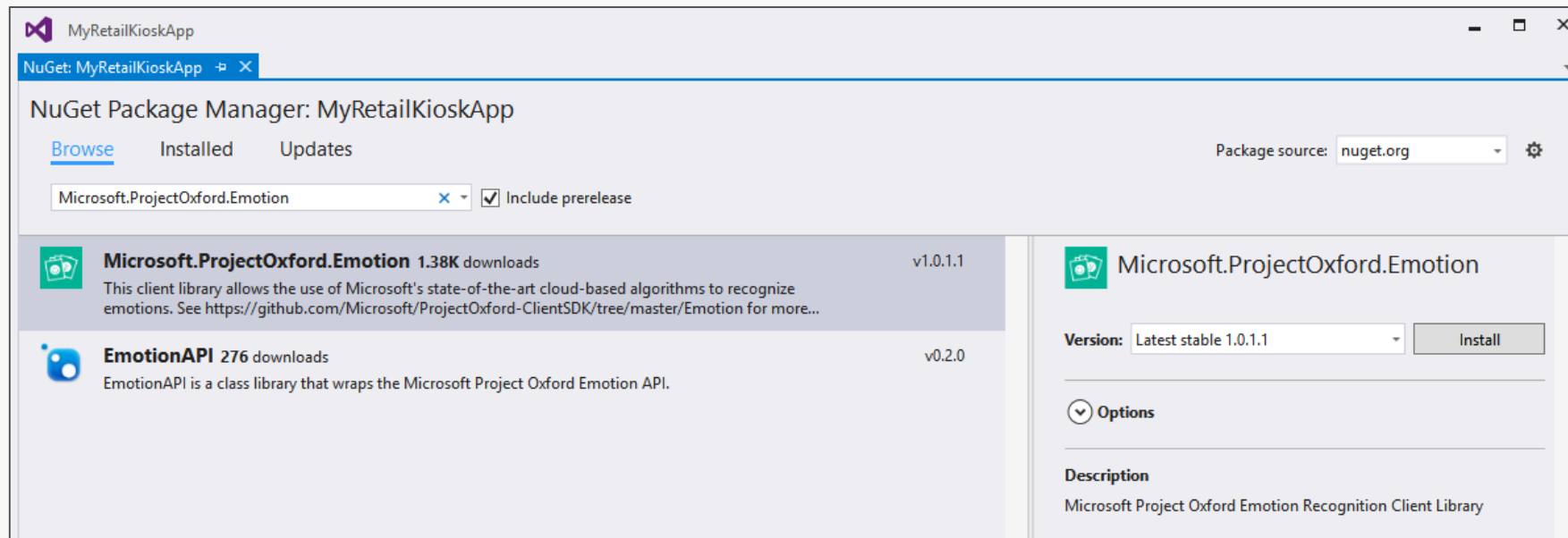
Task 2.5

- From the Solution Explorer, select **Package.appxmanifest** file.

- In the **Capabilities** tab, check **Webcam**.

Application   Visual Assets   **Capabilities**   Declarations

Use this page to specify system features or devices that your app can use.

Capabilities:

- [ ] AllJoyn
- [ ] Appointments
- [ ] Blocked Chat Messages
- [ ] Bluetooth
- [ ] Chat Message Access
- [ ] Code Generation
- [ ] Contacts
- [ ] Enterprise Authentication
- [x] Internet (Client)
- [ ] Internet (Client & Server)
- [ ] Location
- [ ] Microphone
- [ ] Music Library
- [ ] Objects 3D
- [ ] Phone Call
- [ ] Pictures Library
- [ ] Private Networks (Client & Server)
- [ ] Proximity
- [ ] Removable Storage
- [ ] Shared User Certificates
- [ ] User Account Information
- [ ] Videos Library
- [ ] VOIP Calling
- [x] Webcam

Description:

Provides access to the webcam's video feed, whi
connected webcams.

More information

Task 2.6 / 2.7

- Add this Grid in MainPage.xaml

```xml
<Grid.ColumnDefinitions>
  <ColumnDefinition Width="2*"/>
  <ColumnDefinition Width="1*"/>
</Grid.ColumnDefinitions>
<CaptureElement x:Name="capturePreview" Stretch="Uniform" Grid.Column="0"/>

<StackPanel Grid.Column="1">
  <Button x:Name="TakePhoto" VerticalAlignment="Bottom" Content="Take photo"/>
  <Image x:Name="TakenPhoto" Stretch="Uniform"/>
  <ListView x:Name="EmotionList" Width="Auto"/>
</StackPanel>
```

Task 2.8

- Add using References... MainPage.xaml.cs

```
using System.Threading.Tasks;

using Microsoft.ProjectOxford.Emotion;
using Microsoft.ProjectOxford.Emotion.Contract;

using Windows.Devices.Enumeration;
using Windows.Media.Capture;
using Windows.Media.MediaProperties;
using Windows.Storage;
using Windows.Storage.Streams;
using Windows.UI.Xaml.Media.Imaging;
```

Task 2.9

- Set the class variables on the MainPage class

```csharp
private const string EmotionApiKey = "{Emotion API Primary Key}";
private MediaCapture mediaCapture;
private bool isCameraFound;
```

- Replace the API key with the key you got on the azure portal.

Task 2.10

- Create a method to initialize the camera preview using the *MediaCapture* variable and the *CapturePreview* control for the video preview

```csharp
private async void InitializeMediaCapture()
{
    try
    {
        this.mediaCapture = new MediaCapture();
        var devices = await DeviceInformation.FindAllAsync(DeviceClass.VideoCapture);

        // Use the front camera if found one
        if (devices == null || devices.Count == 0)
        {
            this.isCameraFound = false;
            return;
        }

        MediaCaptureInitializationSettings settings;
```

Task 2.11

- In the MainPage constructor add a call for the InitializeMediaCapture function so the Webcam preview starts once the app initializes.

```csharp
public MainPage()
{
    this.InitializeComponent();
    this.InitializeMediaCapture();
}
```

Task 2.12

- Go to the **MainPage.xaml** design surface and **double-click** on the **Take photo** button to generate the click method in MainPage.xaml.cs

- If it is hard to do on the UI....
Either change the zoom ratio -or-
Type Click="and **Press Tab** to let Intellisense create the event.

Task 2.13

- Add the following code in the **TakePhoto_Click** method and make the method **async**.

```
if (!isCameraFound)
{
    return;
}

try
{
    using (var imageStream = new InMemoryRandomAccessStream())
    {
        // capture photo and encode it
        var encodingProperties = ImageEncodingProperties.CreateJpeg();
        await this.mediaCapture.CapturePhotoToStreamAsync(encodingProperties, imageStream);
        await imageStream.FlushAsync();
        imageStream.Seek(0);

        // display photo preview
        var img = new BitmapImage();
```

Run!
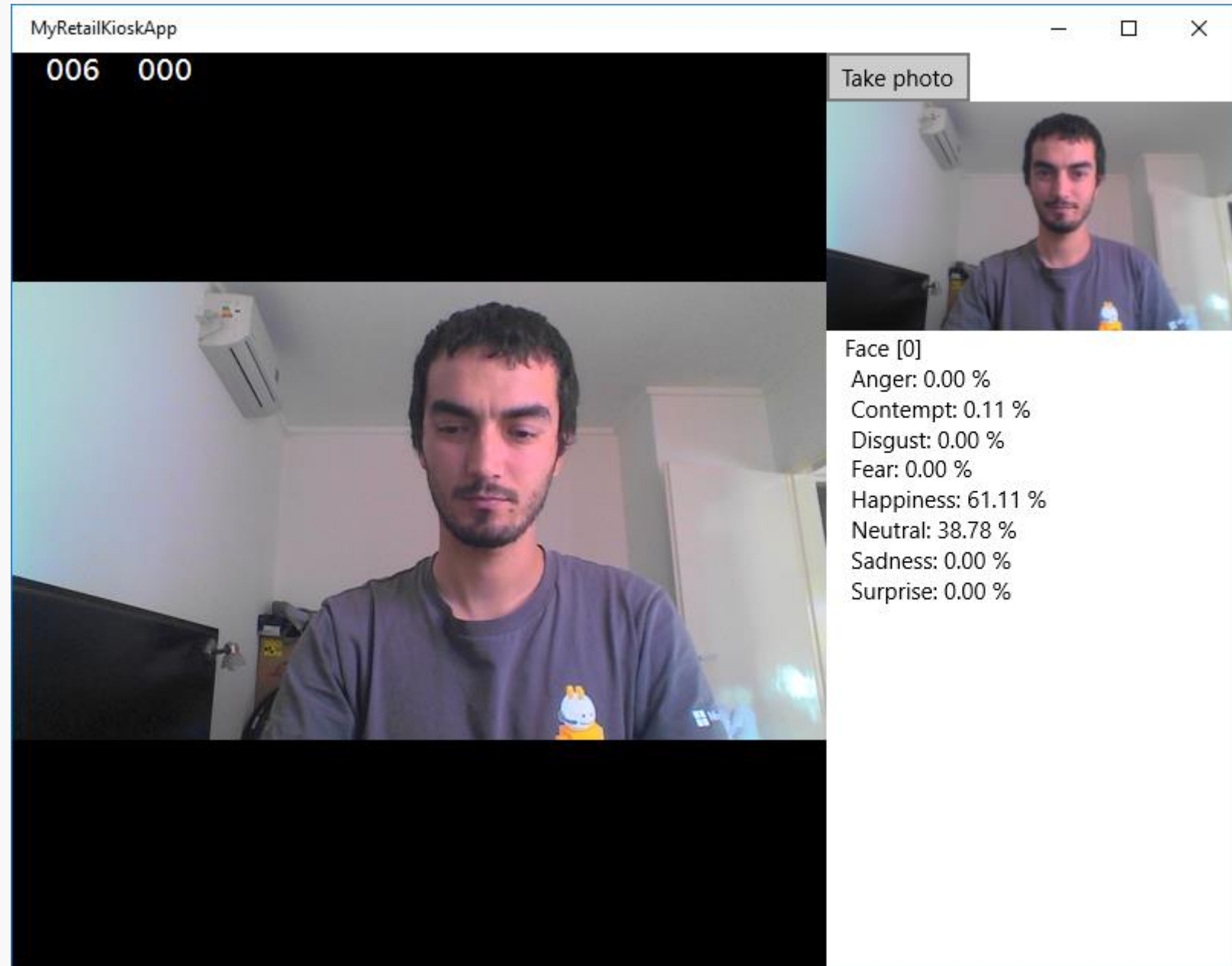
Learn more at the conference

- ## Related Sessions
  Enhancing your Application through Machine Learning APIs
  (Thursday, 6:30PM, Moscone 2004)

  Building Intelligent Systems with Cortana Analytics Suite
  (Thursday, 5:00PM, Moscone 2004)

  Data Science for Developers
  (Friday, 12:30 PM, Marriot 7)

- ## Workshop **(Friday, 2PM)**
  Data Development 3: Building an Intelligent Application
  using Cortana Analytics Machine Learning APIs

- ## Demo Kiosks

- ## Hackathon **(Saturday)**   **mlapi@microsoft.com**

Cortana Intelligence Workshop 2016

Microsoft Conference Center | August 30-31, 2016

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Two-day technical workshop

Architectural guidance and hands-on training

Learn how to build custom solutions, intelligent data-driven apps

Meet 1:1 with Microsoft data scientists to get your questions answered

Network with data professionals from Microsoft and hundreds of other companies

August 30-31, 2016

Redmond, WA

CortanaWorkshop.com

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Why Attend

Discover

Find out what's new with the Cortana Intelligence Suite

Learn about, R Server, R Server & Spark for HDInsight, R Services in SQL Server, RTVS, Azure Data Lake & more...

Learn how other companies are using our solutions

Learn

Attend technical talks & hands-on workshops delivered by seasoned experts

Roll up your sleeves and get your hands dirty!

Share

Connect with other data professionals and technology leaders

Share ideas and help shape the future of the Cortana Intelligence community

Who Should Attend

Developers

Data Scientists

Business Decision Makers

Cost

The cost for the Cortana Intelligence Workshop is $599

Please Complete An Evaluation Form
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or