Contents

1 PL-200 Power Platform Functional Consultant

- **Download Latest Student Handbook and AllFiles Content**
- **Are you a MCT?** - Have a look at our GitHub User Guide for MCTs
- **Need to manually build the lab instructions?** - Instructions are available in the MicrosoftLearning/Docker-Build repository

1.1 What are we doing?

- To support this course, we will need to make frequent updates to the course content to keep it current with the Azure services used in the course. We are publishing the lab instructions and lab files on GitHub

to allow for open contributions between the course authors and MCTs to keep the content current with changes in the Azure platform.

- We hope that this brings a sense of collaboration to the labs like we've never had before - when Azure changes and you find it first during a live delivery, go ahead and make an enhancement right in the lab source. Help your fellow MCTs.

1.2 How should I use these files relative to the released MOC files?

- The instructor handbook and PowerPoints are still going to be your primary source for teaching the course content.
- These files on GitHub are designed to be used in conjunction with the student handbook, but are in GitHub as a central repository so MCTs and course authors can have a shared source for the latest lab files.
- It will be recommended that for every delivery, trainers check GitHub for any changes that may have been made to support the latest Azure services, and get the latest files for their delivery.

1.3 What about changes to the student handbook?

- We will review the student handbook on a quarterly basis and update through the normal MOC release channels as needed.

1.4 How do I contribute?

- Any MCT can submit a pull request to the code or content in the GitHub repro, Microsoft and the course author will triage and include content and lab code changes as needed.
- You can submit bugs, changes, improvement and ideas. Find a new Azure feature before we have? Submit a new demo!

1.5 Notes

1.5.1 Classroom Materials

1.6 It is strongly recommended that MCTs and Partners access these materials and in turn, provide them separately to students. Pointing students directly to GitHub to access Lab steps as part of an ongoing class will require them to access yet another UI as part of the course, contributing to a confusing experience for the student. An explanation to the student regarding why they are receiving separate Lab instructions can highlight the nature of an always-changing cloud-based interface and platform. Microsoft Learning support for accessing files on GitHub and support for navigation of the GitHub site is limited to MCTs teaching this course only.

1.7 title: Online Hosted Instructions permalink: index.html layout: home

2 Content Directory

Hyperlinks to each of the lab exercises and demos are listed below.

2.1 Labs

{% assign labs = site.pages | where_exp:"page", "page.url contains '/Instructions/Labs'" %} | Module | Lab | | --- | --- | {% for activity in labs %}| {{ activity.lab.module }} | [{{ activity.lab.title }}{% if activity.lab.type %} - {{ activity.lab.type }}{% endif %}](/home/ll/Azure_clone/Azure_new/PL-200-Power-Platform-Functional-Consultant/{{ site.github.url }}{{ activity.url }}) | {% endfor %}

2.2 Demos

2.3 {% assign demos = site.pages | where_exp:"page", "page.url contains '/Instructions/Demos'" %} | Module | Demo | | --- | --- | {% for activity in demos %}| {{ activity.demo.module }} | [{{ activity.demo.title }}](/home/ll/Azure_clone/Azure_new/PL-200-Power-Platform-Functional-Consultant/{{ site.github.url }}{{ activity.url }}) | {% endfor %}

2.4 lab: title: 'Lab: Validate lab environment' module: 'Module 0: Course introduction'

3 Module 1: Introduction to the Power Platform

3.1 Practice Lab – Validate lab environment

3.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

3.2 Scenario

In this Module 0 lab, you will acquire a Power Platform trial tenant and access the Power Platform admin center. In the admin center, we will create an individual environment for configuration during the course.

3.3 Exercise 1 – Acquire your Power Platform trial tenant

1. Copy your **Microsoft 365 credentials** from the Authorized Lab Hoster.
2. Navigate to https://powerapps.microsoft.com/. Click **Start free.**
3. Under **Get started**, enter the email address from your Microsoft 365 credentials in the text box that says **Enter your work email address.** Click **Sign up.**
4. You will see a prompt that you have an existing account with Microsoft. Select **Sign in.**
5. Enter the password provided by the Authorized Lab Hoster. Click **Sign in.**
6. At the **Almost there** prompt, click **Start.**

   Note: Depending on your internet browser, you may be prompted to sign in again. Select **Sign in**, click the email account you just signed in with, and continue.
7. Select **Yes** to stay signed in.

3.4 Exercise 2 - Create your environment

In this exercise, you will be create your **Practice** environment that you will do the majority of your lab work in.

3.4.1 Task 1 – Create environment

1. Access https://admin.Powerplatform.com and log in with your Microsoft 365 credentials if prompted again.
2. If you are not automatically directed there, select **Environments** and click **+New.**
   - For **Name**, enter **[my initials] Practice.** (Example: AJ Practice.)
   - For **Type**, select **Trial.** You may see an option for **Trial (subscription-based)** - select the option that only says **Trial.**

- Change the **Create a database for this environment?** toggle to **Yes.**
- Leave all other selections as default and click **Next.**
- On the next tab, change the toggle for **Deploy sample apps and data?** to **Yes.** Click **Save**.

3. Your **Practice** environment should now show in the list of Environments.
4. Your environment may take a few minutes to provision. Refresh the page if needed. When your environment is prepared, select your **Practice** environment by clicking on the ellipses next to its name to expand the drop down menu and select **Settings.**
5. Explore the different areas in **Settings** that you are interested in but do not make any changes yet.

3.5 lab: title: 'Lab 3.1: Creating an app' module: 'Module 3: Work with Dataverse'

4 Module 3: Work with Dataverse

4.1 Lab 3.1: Practice Lab – Creating an app

4.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

4.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. Fabrikam would like to encourage their employees to continuously learn. They want to build an application that allow a small set of employees to create knowledge assessments and then make them available to all employees to test their knowledge. The employees need to be able to pick an assessment and quickly complete it in just a few minutes. In this practice, you will be creating the apps necessary to support this effort.

Working with the solution architect on the project you have determined that you will create two apps.

Fabrikam Knowledge Admin – this will be a model-driven application that you can quickly enable creation of the knowledge assessments by the users.

Fabrikam Knowledge – this will be a canvas app that will be a custom user experience making it easy to find the assessments and take them.

In this practice, you will be starting the creation of these applications and will build them out as you progress through the course. You will also create one of the template applications so you can see how easy it is to get started using a "Make from data" template.

4.3 Exercise 1 – Review Templates and Create App from Data

In this exercise, you will review the template and sample apps that are available on the maker portal. You will also create an app using the Create from data templates to see how quickly that can get a basic canvas app started.

4.3.1 Task 1 – Review + Create templates/samples

If you have time, you can choose any of these and select Make It and explore on your own.

1. Navigate to https://make.powerapps.com. You may need to sign in again using your credentials if necessary.

2. Switch to your **Practice** environment by using the Environment Selector in the upper right corner of the screen. (It will probably say **Contoso (Default)**.) Select your **Practice** environment from the list.
3. Select **+ Create** from the left-hand navigation.
4. Review the different apps that are available to use as both samples and starting templates.
5. If you have time, choose any of these and select **Make it.** When you are done proceed to Task 2.

4.3.2 Task 2 – Create an app over data for Account

Starting a canvas app from data is a quick way to start a canvas app when the goal is to have a list of data from an entity.

1. Select **+ Create** again.
2. Click **Canvas app from blank**. In the dialog box, name your app **Fabrikam Accounts** and select **Phone** layout.
3. Click **Create** in the dialog. (You may be required to sign in again; enter your tenant credentials if necessary.)
4. Your app should open in the designer. (You may get a few pop-ups first; close them.) In the white space, click the **connect to data** link.
5. Select **Data** from the left bar. From the list of entities, select **Accounts.**
6. Add a header to your app by selecting the + button (the Insert button) on the left tab and selecting **Text label.** Use the pane on the right side of the screen to enter **Fabrikam Accounts** in the **Text** field. You can edit the size, font, and other attributes to customize the look and feel of the application.
7. Add a list of accounts to your app by selecting the + button on the left tab and selecting **Vertical Gallery** from the **Layout** section.
8. A vertical gallery will be inserted into your app, and you will be prompted to select which data source it should pull from. Select **Accounts** from the pop-up.
9. The application will load list of the accounts (it may be blank for now). Drag the gallery to fit the app or resize to your liking.
10. To preview your app, click **Play** (it will look like a Play button) in the upper right corner.
11. Click **File** and select **Save**.
12. Select the **Cloud** and enter **Fabrikam Accounts** in the **Name** box.
13. Click **Save**.
14. Explore the app as much as you want and then proceed to the next exercise. This app will be saved, and you can always revisit it later.
15. Close the **App Designer**.

4.4 Exercise 2 – Create the model-driven app

In this exercise, you will be creating the Knowledge Admin model-driven app. In the data modeling module, you will be creating all the entities, so getting this started will be easy.

4.4.1 Task 1 – Create a model-driven app

1. Go back to https://make.powerapps.com and make sure you are in your **Practice** environment.
2. Click on **+ Create** and select **Model-driven app from blank.** Select **Create** in the pop-up window.
3. Enter **Knowledge Admin** for Name and click **Done**.
4. Click the edit icon (it looks like a pencil) next to **Site Map**. *Note:* When you start a new app, you must edit the site map before you can run it - otherwise you will get an error. You need to add at least one item to the navigation.
5. Click on the **New Area**.
6. Enter **Administration** for **Title**.

7. Select the **New Group**.
8. Enter **User Admin** for **Title**.
9. Select the **New Subarea**.
10. Select **Entity** for **Type**.
11. Select **User** for **Entity**.
12. Click **Save**.
13. Click **Publish**.
14. Close the sitemap editor by clicking **Save and Close**.
15. Click **Save** and then click **Publish.** After publishing, close the app designer by clicking **Save and Close** again.
16. Select **Apps**.
17. The **Knowledge Admin** application you created should be listed. Open the **Knowledge Admin** application by selecting the row and clicking **Play.**
18. The **Model-Driven** application **Knowledge Admin** will load.
19. Open one of the **Users**.
20. The User form of the selected record will load.
21. Close the application.

4.5 Exercise 3 – Create the Knowledge canvas App

In this exercise, you will be creating the Fabrikam Knowledge canvas app. We will build out the detailed user experience in the upcoming canvas app module.

4.5.1 Task 1 – Create a canvas app

1. Go back to https://make.powerapps.com and make sure you are in your **Practice** environment.
2. Select **Solutions** and open **Common Data Services Default Solution**.
3. Click **New, App, Canvas App,** and then **Tablet Form Factor**.
4. Click **Skip** if you see a prompt before the designer loads.
5. The Canvas App Designer will load. Hover over **Screen1** and click on the **...** button.
6. Select **Rename**.
7. Enter **mainScreen** and press the enter key. *Note:* It is always a good idea to give components meaningful names. It makes them easier to use as your application gets more complex.

4.5.2 Task 2 – Add Header to the App

Part of making a good app is giving it a personality. We are going to keep things simple here and just add a basic header to the app.

1. Select the **Insert** tab at the top of the screen.
2. Click **Text Label**.
3. A label will be added to the screen. Select the label.
4. Rename the label **headerLabel** by clicking the edit button in the control tree on the left side of the screen in Tree View.
5. Change the **Font Size** to **28.**
6. Click **Color** and change color to **White**.
7. Click **Text Alignment** and select **Center**.
8. Click **Fill** from the top menu and change the **Fill Color** to **Blue**.

9. Locate the **Position** section on the Properties window.
10. Enter **0** for **Y** and **0** for **X**.
11. Locate the **Size** section.
12. Enter **1365** for **Width** and **60** for **Height**.
13. Double click on the **Text** of the label.
14. Replace **Text** with **Fabrikam Assessment**.

4.5.3 Task 3 – Add User Name to the Header

In this task, you are going to leverage the User() information to add the name of the current user to the header.

1. Select the **MainScreen** in the left control tree.
2. Select the **Insert** tab from the top menu and click **Label.**
3. Rename the label **userLabel**.
4. Make sure text **Text** property is selected and the function value (in the top menu, where you see fx) is now **"Text".**
5. Replace **"Text"** with the following:

   ```
   User().FullName
   ```

6. The user's Full Name will now be displayed on the label. Select the **Home** tab and make sure the text box is selected.
7. Change the **Font Size** to **14**.
8. Change the Font **Color** to **White.**
9. Click **Align** and select **Right** from the top menu.
10. Click **Text align** from the Properties tab on the right and select **align right.**
11. Set **Position Y** to **0**.
12. Locate **Size** and set the Height to **60**.
13. Locate **Padding** and enter **10** for **Right**.
14. Click **File** and select **Save**.
15. Select **Cloud** and enter **Fabrikam Assessment** for **Name**.
16. Click **Save**.
17. Click on the **Back** button.
18. Click **Play**.
19. Your application will load.
20. Close the preview.
21. Close the Canvas App Designer.
22. Click **Done**.

4.6 lab: title: 'Lab 3.2: Creating entities and fields' module: 'Module 3: Work with Dataverse'

5 Module 3: Work with Dataverse

5.1 Lab 3.2: Practice Lab – Creating entities and fields

5.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

5.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. Fabrikam would like to encourage their employees to continuously learn. They want to build an application that allow a small set of employees to create knowledge assessments and then make them available to all employees to test their knowledge. The employees need to be able to pick an assessment and quickly complete it in just a few minutes. In this practice, you will be creating a data model to support the applications.

Working with the client, you have determined the following basic needs for storing data:

- A Knowledge Assessment entity will represent the actual assessment and contain one or more questions in an entity Knowledge Question
- A Knowledge Test Result entity will track when employees take an assessment
- The employee who took the assessment will be tracked using the existing Common Data Model (CDM) User entity
- The CDM Feedback entity will be used to allow employees to express their opinions on the assessment

After consulting with your Solution Architect, you have come up with the following data model. When you are done with this module, you will have created the entities, fields and relationship to implement the following data model, **as shown in the Lab Resources as Image[MB-200]_M02L02_Creating_Entities_Fields.png**.

In this practice, you will be creating the entities and fields. Later, when we discuss relationships you will come back and add the relationships between the entities. Relationships in the above drawing are the lines connecting the entities and labeled as 1:N and N:1. The entities that are white with black writing are standard CDM entities that we will be re-using.

5.3 Exercise 1 – Create the Knowledge Assessment Entity

In this exercise, you will be creating the Knowledge Assessment entity and its fields. Knowledge Assessment will be a new custom entity you create.

5.3.1 Task 1 – Create an entity

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions**.
4. Click to open the **Common Data Services Default Solution**.
5. Click **New** and select **Entity**.
6. Enter **Knowledge Assessment** for **Display Name**. Enter **Title** for **Display Name** in the Primary Field section.

7. Click **Done**. It may take a few minutes for your entity to be created.
8. With the **Fields** tab selected, click **Add Field**.
9. Enter **Start Date** for **Display Name** and select **Date Only** for **Data Type**.
10. Click **Advanced Options** and make sure **User Local** is selected for **Behavior**.
11. Click **Done**.
12. Click **Add Field** again.
13. Enter **End Date** for **Display Name** and select **Date Only** for **Data Type**.
14. Click **Advanced Options** and make sure **User Local** is selected for **Behavior**.
15. Click **Done.**
16. You will now add an **Option Set** type field. Click **Add Field**.
17. Enter **Difficulty** for **Display Name** and select **Option Set** for **Data Type**.
18. Click on the **Option Set** dropdown and select **+New Option Set**.
19. Enter **Beginner** for **Item 1** and click **Add New Item**.
20. Enter **Intermediate** for **Item 2** and click **Add New Item**.
21. Enter **Advanced** for **Item 3** and click **Save**.
22. Select **Beginner** for the **Default Value** and click **Done**.
23. Click **Save Entity** at the bottom of the screen.

5.3.2 Task 2 – Create a calculated field

1. Click **Add Field**.
2. Enter **Days Remaining** for **Display Name** and select **Whole Number** for **Data Type**.
3. Click **Advanced Options**.
4. Enter **0** for **Minimum Value** and **1000** for **Maximum Value**.
5. Click **+Add** next to **Calculated or Rollup**. Click **+Calculation.**
6. Click **Save**. A pop-up window should appear allowing you to configure the calculation. (You may need to disable a pop-up blocker.)
7. Click **Add Action**.
8. Enter the following formula:

   ```
   DIFFINDAYS(NOW(), crXXX_enddate)
   ```

   Note: That crXXX is environment-dependent and the name of your environment will be different. To find your environment-specific designation, type **cr** and wait for the field to auto filter to your environment.
9. Click the check mark. (Depending on your window size, you may need to click out of the text box to see the check mark.)
10. Click **Save and Close**.
11. Click **Done**.

5.4 Exercise 2 – Create the Knowledge Question Entity

In this exercise, you will be creating the Knowledge Question entity and its fields.

5.4.1 Task 1 – Create an entity

1. Go back to https://make.powerapps.com and make sure you are in your **Practice** environment.
2. Select **Solutions**.
3. Open the **Common Data Services Default Solution**.

4. Click **+New** and select **Entity**.
5. Enter **Knowledge Question** for Display Name.
6. Navigate to the **Primary Name Field** section.
7. Change the **Display Name** to **Question**. The **Name** field should also automatically update to **Question.** Click **Done**.
8. Make sure the **Fields** tab is selected and click **Add Field**.
9. Enter **Answer 1** for **Display Name**, select **Text** for **Data Type** and click **Done**.
10. Add **3** more with values below:
    - Name: **Answer 2**, Data Type: **Text**.
    - Name: **Answer 3**, Data Type: **Text**.
    - Name: **Answer 4**, Data Type: **Text**.
11. Click **Add Field**.
12. Enter **Answer 1 Points** for **Display Name**, select **Whole Number** for **Data Type** and click **Done**.
13. Add 3 more filed with values below. These will store the points awarded if someone picks this answer.
    - Name **Answer 2 Points** Data Type **Whole Number**.
    - Name **Answer 3 Points** Data Type **Whole Number**.
    - Name **Answer 4 Points** Data Type **Whole Number**.
    - Click **Save Entity**.

Note: There are many ways you could model the answers depending on the complexity of your requirements. The approach shown here is simplified for practice purposes to focus on demonstrating how to work with the entity creation process.

5.5 Exercise 3 – Create the Knowledge Test Result Entity

In this exercise, you will be creating the Knowledge Test Result entity and its fields.

5.5.1 Task 1 – Create an entity

1. On the navigation menu, click **Common Data Services Default Solution** to return to the solution.
2. Click **+New** and select **Entity**.
3. Enter **Knowledge Test Result** for **Display Name** and click **Done**.
4. Click **Add Field**.
5. Enter **Total Points** for **Display Name** and select **Whole Number** for **Data Type**.
6. Click **Done**.
7. Click **Save Entity**.

5.6 Exercise 5 – Add existing entities to the solution

In this exercise, you will be adding the existing entities Feedback and User. This ensures when relationships are created later between theses entities they will be tracked as part of the solution.

5.6.1 Task 1 – Add existing entities

1. From the navigation menu, click **Common Data Services Default Solution** to return to the solution.
2. Click **Add Existing** and select **Entity**.
3. Select the **Feedback** and **User** entities and click **Next**.
4. Leave the **Include All Components** and **Include Entity Metadata** unchecked and click **Add**.
5. Your solution will now have **5 Entities** and **1 Option Set** in addition to your apps.

6. Click **Publish All Customizations**.

5.7 lab: title: 'Lab 3.3: Create relationships' module: 'Module 3: Work with Dataverse'

6 Module 3: Work with the Common Data Service

6.1 Lab 3.3: Practice Lab – Create relationships

6.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

6.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You are working on the data model you started in the prior practice. In this practice you will be adding the relationships to what you created in the prior practice. If you haven't completed that practice you should pause this practice and complete that first.

The following is the data model you are building. At this point all the entities are created and you are ready to create the relationships. Please refer to the file labeled **LAB[PL-200]_Data_Model** in the Lab Resources to view the entity relationship diagram.

The following relationships need to be created.

1. Knowledge Assessment to Knowledge Question changing the relationship behavior to be parental.
2. Knowledge Assessment to Knowledge Test Result changing the relationship behavior to be parental.
3. User to Knowledge Test Result we don't need to create because we will assign the user who took the test as the owner of the record. An alternative design could have left owner to track who is working on the record and create another relationship to track who took the assessment. For our purposes we are going to keep it simple and use record owner.
4. The relationship to Feedback is handled via an entity option you will be doing in a future practice.

Important Note: This lab will provide you with an actual Office 365 tenant and licenses for the Power Platform applications you will be using in this course. You will only be provided with one tenant for the practice labs in this course. The settings and actions you take within this tenant do not roll-back or reset, whereas the virtual machine you are provided with does reset each time you close the lab session. Please be aware that Office 365 is evolving all the time. The instructions in this document may be different from what you experience in your actual Office 365 tenant. It is also possible to experience a delay of several minutes before the virtual machine has network connectivity to begin the labs.

6.3 Exercise 1 – Create the Knowledge Assessment Relationships

In this exercise, you will be creating the relationships for Knowledge Assessment entity.

6.3.1 Task 1 – Knowledge Assessment to Knowledge Question Relationship

In this task, you will create a One-to-Many relationship between the Knowledge Assessment and Knowledge Question entities.

1. Navigate to https://make.powerapps.com and make sure you are in your **Practice** environment.
2. Select **Solutions** and open the **Common Data Service Default Solution.**

3. Click to open the **Knowledge Assessment** entity.
4. Select the **Relationships** tab.
5. Click **+Add Relationship** and select **One-to-Many**.
6. Select **Knowledge Question** for **Related Entity** and click **Done**.
7. Click **Save Entity**. It is a good idea to save your changes as you make them.

6.3.2 Task 2 – Knowledge Assessment to Knowledge Test Result Relationship

In this task, you will create a One-to-Many relationship between the Knowledge Assessment and Knowledge Test Result entities.

1. Make sure you have the **Relationship** tab selected.
2. Click **Add Relationship** and select **One-to-Many**.
3. Select **Knowledge Test Result** for **Related Entity** and click **General**.
4. The relationship names must be unique. Change the **Relationship Name** to **KnowledgeAssessment_KnowledgeResult**.
5. Click **Done**.
6. Click **Save Entity**.
7. From the navigation menu, click **Common Data Services Default Solution**.
8. Click **Publish All Customizations**.

6.4 Exercise 2 – Adjust relationship behaviors

In this exercise, you will be changing the relationship behaviors to be parental. You will be performing this change in the classic Solution Explorer.

6.4.1 Task 1 – Change the relationship behavior

1. Make sure you still have the **Common Data Services Default Solution** open.
2. Click on the ellipses located next to **Publish All Customizations** and select **Switch to classic**.
3. Expand **Entities**.
4. Expand the **Knowledge Assessment** entity.
5. Select **1:N Relationships**.
6. Double click to open the relationship where **Knowledge Question** is listed as the Related Entity.
7. Scroll down to the **Relationship Behavior** section and locate the **Type of Behavior** field.
8. Select **Parental** for **Type of Behavior**.
9. Click **Save and Close**.
10. Open the relationship with the **Knowledge Test Result** related entity.
11. Change the **Type of Behavior** to **Parental**.
12. Click **Save and Close**.
13. Click **Publish All Customizations**.

6.5 lab: title: 'Lab 3.4: Additional entity options' module: 'Module 3: Work with Dataverse'

7 Module 3: Work with Dataverse

7.1 Lab 3.4: Additional table options

7.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

7.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You are working on the data model you started in the prior practice. In this practice you are enabling some entity options that can only be done using the classic solution explorer.

To view the data model you are building, **view Image[MB-200]_M02L02_Creating_Entities_Fields.png in the Lab Resources**.

In this practice, you will be performing the following tasks.

1. Enabling the Feedback option on Knowledge Assessment. This will cause the system to create the relationship between Knowledge Assessment and the CDM Feedback entity.
2. You will enable auditing on the Knowledge Assessment entity.
3. You will be updating the icon on the Knowledge Assessment entity, so it is not using the default icon.

7.3 Exercise 1 – Enable Entity Options

In this exercise, you will enable the Feedback option on Knowledge Assessment as well as enable auditing. You will then update the icon on the Knowledge Assessment entity.

7.3.1 Task 1 – Enable Feedback and Auditing Options for Knowledge Assessment

1. Navigate to https://make.powerapps.com/ and make sure you are in your **Practice** environment.
2. Select **Solutions**.
3. Click to open **Common Data Services Default Solution**.
4. Click on the ellipses and select **Switch to Classic**.
5. Expand **Entities**.
6. Select the **Knowledge Assessment** entity.
7. Scroll down to the to the **Communication and Collaboration** section.
8. Select the **Feedback** checkbox. *Note:* Enabling any option with a + cannot be undone, so always confirm before you enable any of those features that you are on the right entity and need the feature.
9. Scroll down to the **Data Services** section.
10. Check the **Auditing** checkbox. *Note:* Remember auditing must be turned on at the environment settings, entity and field to produce any audit data. By default, fields are enabled for auditing.
11. Click **Save**.
12. Click **Publish.**

7.4 lab: title: 'Lab 4.1: App designer' module: 'Module 4: Build Power Apps'

8 Module 4: Build Power Apps

8.1 Lab 4.1: Practice Lab – App designer

8.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

8.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. In this lab you will be continuing your work on the model-driven Knowledge Admin app. Previously, all you have done is set up the basic app. Now that you have the data model defined, you can add the other entities to the app navigation.

8.3 Exercise 1 – Edit the site map

In this exercise, you will use the site map designer to add the other entities to the app navigation.

8.3.1 Task 1 – Edit the site map

1. Navigate to https://make.powerapps.com
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions**.
4. Open **Common Data Services Default Solution**.
5. Select the **Knowledge Admin** model-driven application. Click the **edit** (the pencil) next to **Site map.**
6. Drag **Area** from the **Components** tab and place it directly to the right of the **Administration** area, in the gray top bar.
7. Select the new area, click the **Edit** button, and enter **Assessments** for **Title**.
8. Make sure the **Assessments** group you created is selected.
9. Select the **Components** tab.
10. Drag **Group** and place it in the **Assessments** area.
11. Click **Edit.** Enter **Configuration** for **Title**.
12. Select the **Configuration** group you just added.
13. Select the **Components** tab.
14. Drag a **Subarea** to the **Configuration** group.
15. Select the **New Subarea**.
16. Select **Entity** for **Type**.
17. Select **Knowledge Assessment** for **Entity**.
18. Select the **Configuration** group.
19. Select the **Components** tab.
20. Drag **Subarea** to the **Configuration** group.
21. Select **Entity** for **Type** and **Knowledge Test Result** for **Entity**.

22. Click **Save**.
23. Click **Publish**.
24. Click **Save and Close**.
25. The entities you added to the sitemap are now referenced in the app designer.
26. **Do not** close the app designer.

8.4 Exercise 2 – Other app designer changes

In this exercise, you will use the app designer to filter what is visible.

8.4.1 Task 1 – Add and remove components

Components can easily be added and removed from an app. Remember an app is just a view into the entities that exist in your environment. Removing them from an app does not physically remove the entity.

1. With the app designer still open, click **+ Add**.
2. Select **Entities**.
3. Select the **Account** entity. The Account will be added to the app.
4. Uncheck the **Account** entity. The Account entity will be removed from the application.

8.4.2 Task 2 – Validate and adjust what forms and views show

Validating your app will alert you if you are missing any dependencies or other issues. We will also adjust what forms and views are available to the app. By limiting them now we won't be surprised if somebody adds a view in CDS later. We can then specifically choose which forms and views will show in our app you can do this for the other components as well.

1. Select **Forms** for the **Knowledge Assessment** entity.
2. By default, all available components are selected. Uncheck the **All** checkbox.
3. Check the **All** checkbox. Both forms will be selected.
4. Select the **Views** of the **Knowledge Test Result**.
5. All the **Views** are currently selected. Uncheck the **All** checkbox.
6. All but one Public View will be unchecked. You are required to have at least one view.
7. Check the All checkbox. All the views will be selected.
8. You don't have Dashboards or Charts yet. Click **Save**.
9. Click **Validate**.
10. You will get warnings letting you know you that application users will see all forms and views.
11. Click **Publish**.
12. Click **Save and Close**.
13. Click **Done.**

8.4.3 Task 3 – Run the Application

1. Make sure you still have the **Knowledge Admin** model-driven app selected.
2. Click **Play**.
3. The application will load. The current area is shown on the bottom-left of the page (**Administration**). The **Enabled users** view will load and you will see a list of enabled users.
4. Click on the **Administration** area and switch to the **Assessments** area.
5. The **Active Knowledge Assessments** view will load.
6. Click **+ New**.

7. Enter **Test Assessment One** for **Title** and click **Save.**
8. Click + **New** Again.
9. Enter **Test Assessment Two** for **Title** and click **Save and Close.**
10. Select on **Knowledge Assessments** in the left bar.
11. The two records you created will be visible in the view.
12. Select the **Knowledge Test Results**.
13. The view will load but you won't have any records.
14. Click on the **Assessments** area at the bottom of the screen and click **Administration** to return to the Administration area.
15. You can close the model-driven app.

8.5 lab: title: 'Lab 4.2: Modify forms' module: 'Module 4: Build Power Apps'

9 Module 4: Build Power Apps

9.1 Lab 4.2: Practice Lab – Modifying forms

9.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

9.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. In this practice you will be continuing your work on the model-driven Knowledge Admin app. In this practice, you will be modifying the auto generated forms to add the new fields you added in the data-modeling practice.

9.3 Exercise 1 – Edit the Knowledge Assessment Form

In this exercise, you will edit the form for the Knowledge Assessment entity.

9.3.1 Task 1 – Enable Notes on the Knowledge Assessment entity

Initially when the entity was created notes were not enabled. Since then the client Fabrikam has determined that they like to be able to track notes against the knowledge assessments. We are going to make this change before getting into the form editor, because this is the easiest way to perform these configuration steps. The same is true, for example, if you need to add any fields: you should always try to add the fields before jumping into the editor.

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions**.
4. Open the **Common Data Service Default Solution**.
5. Click on the **Knowledge Assessment** entity.
6. Click **Settings** in the command bar.
7. Check the **Enable Attachments** checkbox. This enables notes and files for the entity.

8. Click **Done**. Confirm the changes by clicking **Okay.**
9. Click **Save Entity**.

9.3.2 Task 2 – Edit the Knowledge Assessment form

In this task, you will perform the following changes to the form:

- Put fields in the header
- Insert the Timeline control
- Add a tab that contains a list of related assessment questions

To customize your form:

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions**.
4. Open the **Common Data Service Default Solution**.
5. Select the **Knowledge Admin** model-driven app.
6. Click **Edit**.
7. Locate the **Knowledge Assessment** entity and select **Forms**.
8. Go to the **Components** tab, hover over the **Information** form in the **Main Forms** section, and click **edit** (the pencil icon).
9. Click on the **Header** section of the form. (This is the top section of the form that says **New Knowledge Assessment.**)
10. In the **Field Explorer** (the left bar showing the fields), uncheck the **Show only unused fields** checkbox.
11. Drag the **Owner** field for the **Field Explorer** and place it in the **header** on the right side of the form. You should now have two **Owner** fields on the form: one in the **General** section, and one in the **header.**
12. Select the **General** tab by clicking on it. Enter **General** in the **Name** field in the Properties pane.
13. Expand the **Formatting** section.
14. Select **Two Columns** for **Layout.**. Click **Save**.
15. Select the **Days Remaining** field and drag it to the header next to **Owner.**
16. Select the new section of the **General** tab.
17. Select the **+ Component** tab.
18. Click **Timeline** from the **Related data** section in the Components pane and drag it to the New Section. After the timeline is filled into the New Section, select the **New Section** that the timeline was just added to. Change the **Label** to **Timeline** and change the **Name** to **Timeline.**
19. Select the **Owner** field from the **General** section.
20. Click the **trash** button from the top menu. We are removing this field because we added a duplicate field to the header.
21. Add the **Start Date** field to the **General** section and place it below the **Title** field. You can add fields to the form by dragging the field from the field explorer and dropping it in the section you want to add the field to.
22. Add the **End Date** to the **General** section and place it below the **Start Date** field.
23. Add the **Difficulty** field to the **General** section and place it below the **End Date** field.
24. Select the **+ Component** tab.
25. Click **1 column tab**. A new tab will be added to the form.
26. Click on the new tab.
27. Change the **Label** to **Questions**.

28. Select the **Questions** tab.
29. Return to the **+ Components** tab.
30. Click **Subgrid** from the **Related data** section. Check the **Show related records** check box and select **Knowledge Questions** for Entity. Then click **Done.**
31. In the right properties tab, enter **KnowledgeQuestions** for **Name** and **Knowledge Questions** for label.
32. Select **Show related records.**
33. Make sure **Knowledge Questions (Knowledge Assessment)** is selected for **Entity.**
34. Select the **New Section** that the subgrid was added to. In the Properties tab, enter **Knowledge Questions** for Label and **KnowledgeQuestions** for name. Click **Save**.
35. Click **Publish** and wait for the publish to complete.
36. Close the form designer tab. You should return to the model-driven app designer.
37. **DON'T** close the app designer.

9.4 Exercise 2 – Edit the Knowledge Question Form

In this exercise, you will edit the form for the Knowledge Question entity.

9.4.1 Task 1 – Edit the main form

1. Make sure you are in the app designer.
2. Click **+ Add** and select **Entities**.
3. Locate the **Knowledge Question** entity and select it.
4. After the **Knowledge Question** entity is added to the application, select **Forms**.
5. Hover over the **Information** form in the **Main Form** section and click **edit** (the pencil icon).
6. Select the **Header** by double clicking on it.
7. Add the **Knowledge Assessment** field to **Header** (the top part of the form) and place it on the right side of the header.
8. Select the **General** tab by double clicking. In the right **Properties** tab, enter **General** for Name.
9. Select **+Component** from the command bar.
10. Click **1-Column section.**
11. Double click on the new section.
12. Enter **Answers** for Label. Select the **Fields** tab on the left menu (it will look like a box with ABC in it).
13. Add **Answer 1** field to the **Answers** section.
14. Add **Answer 1 Points** after the **Answer 1**.
15. Repeat the two steps above for each Answer and Points.
16. Click **Save**.
17. Click **Publish** and wait for the publish to complete.
18. Close the form editor. You should return to the model-driven app designer.
19. Click **Save** to save the changes to the application.
20. Click **Validate** and make sure there are no errors. You can ignore the warnings.
21. Click **Publish** to publish your changes.
22. **DON'T** close the app designer.

9.4.2 Task 2 – Test Your Work

1. Click **Play**.
2. Switch from the **Administration** section to the **Assessments** section. Select the **Knowledge Assessment** entity and click + **New**.
3. The form should have two tabs: **General** and **Questions**.
4. The General tab should have two sections: **General** and **Timeline**.
5. Enter **Test Assessment Three** for **Title**.
6. Select today's date for **Start Date** and select ten days into the future for **End Date**.
7. Select **Beginner** for **Difficulty**.
8. Click **Save**.
9. Make sure the **Days Remaining** value was calculated correctly.
10. Select the **Questions** tab.
11. Click + **New Knowledge Question**.
12. Close the application without creating **Knowledge Question** record.
13. You should return to the app designer. Click **Save and Close** to close it.

9.5 lab: title: 'Lab 4.3: Modify views' module: 'Module 4: Build Power Apps'

10 Module 4: Build Power Apps

10.1 Lab 4.3: Practice Lab – Modify views

10.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

10.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. In this practice you will be continuing your work on the model-driven Knowledge Admin app. In this practice, you will be modifying the auto generated views to add the new fields you added in the data-modeling practice.

10.3 Exercise 1 – Edit the Knowledge Assessment View

In this exercise, you will edit the view for the Knowledge Assessment entity. By default, the auto generated views only show the primary attribute and created on date.

10.3.1 Task 1 – Edit the Knowledge Assessment active item view

1. Navigate to https://make.powerapps.com
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Open the **Common Data Services Default Solution**.
5. Open the **Knowledge Assessment** entity.

6. Select the **Views** tab.
7. Click to open the **Active Knowledge Assessments** view.

10.3.2 Task 2 – Add and Remove Columns from View

1. The **Active Knowledge Assessment** view currently has two columns. In the **Fields** menu on the left, expand the dropdown menu and change to **All.**
2. Click on the **Status Reason** field.
3. The **Status Reason** field will be added to view. Click on the **Owner** field.
4. The **Owner** field will be added to the view. Click on the **Modified By** field.
5. Click on the **Modified By** column header, select **Insert Column**, and expand the dropdown to **All** again.
6. Select **Modified On**. The view should now have six columns.
7. You will now remove the **Created On** field. Click on the dropdown button of the **Created On** column.
8. Click **Remove**.
9. The **Created On** column will be removed from the view.
10. You will now add a field from a related entity to the view. From the **Fields** side bar, select the **Related** tab.
11. All the entities that the **Knowledge Assessment** entity has a **N:1** relationship with will be listed here. Expand **Owning User (User).**
12. Enter **Email** on the search box and enter.
13. Select **Primary Email**. The **Primary Email** will be added to the view.
14. Click **Save**.

10.3.3 Task 3 – Reorder View Columns and Change Column Width

Generally, you will always want to have the order of the fields in view be the highest value to lowest unless you have other specific needs.

1. You will now reorder the columns. Select the **Owner** column header and click **Move Left**.
2. You can also reorder columns by drag/drop. Drag the **Primary Email** column header and drop it to the left of the **Status Reason** column.
3. Move the **Modified On** column to right of the **Modified By** column.
4. The columns order should now be **Title**, **Owner**, **Primary Email**, **Status Reason**, **Modified By**, and **Modified On**.
5. You will now make the **Title** and **Primary Email** columns wider. Select the **Title** column header and drag the right edge to the right. The **Title column** should get wider.
6. Select the **Primary Email** column header and drag the right edge to the right until the entire email addresses are visible.
7. Click **Save**.

10.3.4 Task 4 – Sorting

The View is now sorted by the **Title (A-Z).** You will configure the sorting to be based on the Modified On field first.

1. Locate the **Sort By...** area located in the view properties.
2. Remove the default value. We want to sort **Modified On**.
3. Click **Sort By** and select **Modified On**.
4. Click **Then Sort By** and select **Owner**.
5. Click **Save**.

10.3.5 Task 5 – Use Save as to create a copy

In this task, you will use the Save As feature to create a template for new views. An easy way to create views is to create the first one with all the fields you want, then save as the view and change the filter to what the new view needs.

1. Add **Days Remaining** as the last column in the view. Then click the **dropdown** button next to the **Save** button.
2. Select **Save As**.
3. Enter **Created This Month** for Name and click **Save**.
4. Locate the **Filter By** section of the **View** property. You should have **Status is 'Active'**. All records have a status field; if you don't filter to only show active, you may have records showing in your list that are not editable or meant to be inactive. Inactive is used in the Common Data Service to mark records as soft deleted as an alternate to physically deleting the records.
5. You will add the Created On field back to the view. Click on the **+ Add Column** button located on the top right of the view.
6. Select All and then select **Created On**.
7. In the **Properties** pane, select **Edit filters.**
8. In the pop-up, click **+Add** and select **+Add row.**
9. In the first dropdown, select **Created on**. In the second dropdown, select **This Month**. Make sure the box for both rows are checked.
10. Click **OK**.
11. Click **Save**.
12. Click **Publish**.
13. Click the **back** button.
14. From the navigation breadcrumbs, click on the solution name **Common Data Services Default Solution**.
15. Click **Publish All Customizations**.

10.3.6 Task 6 – Test the View

1. While still on https://make.powerapps.com, select **Apps**.
2. Click on the **Knowledge Admin** model-driven application and select **Play.** Switch from **Administration** to **Assessments.**
3. The **Active Knowledge Assessments** view will be loaded. Make sure the columns you selected are there in the order you selected. (You may need to use the view drop-down to re-select the view and cause it to refresh.)
4. Click the **Select a view** dropdown next to the **Active Knowledge Assessments** view title and choose the **Created This Month** view.
5. Make sure the columns are showing in the order you selected.

10.4 lab: title: 'Lab 4.4: Build charts' module: 'Module 4: Build Power Apps'

11 Module 4: Build Power Apps

11.1 Lab 4.4: Build charts

11.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

11.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. In this practice you will be continuing your work on the model-driven Knowledge Admin app. In this practice, you will be creating a chart to use as a leader board to show the top 5-point earners based on the Knowledge Test Result data.

11.3 Exercise 1 – Create a chart

In this exercise, you will create a chart using the Knowledge Test Result data.

11.3.1 Task 1 – Edit the Knowledge Assessment active item view

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Open the **Common Data Services Default Solution**.
5. Click on the **Knowledge Test Result** entity.
6. Select the **Charts** tab.
7. Click **Add Chart**.
8. Enter **Leader Board** for **Name**.
9. Click **Charts > Bar** to expand the dropdown and select **Bar**.
10. Click on the **Top/Bottom Rules > Top X Rule** and select **Top 5 Items**.
11. Select **Total Points** for **Legend Entities (Series).**
12. Select **Owner** for **Horizontal (Category) Axis Label**.
13. Click **Save > Save and Close**.
14. Click **Done**.
15. From the navigation breadcrumbs, click on the solution name **Common Data Service Default Solution**.
16. Click **Publish All Customizations** located in the command bar.

11.3.2 Task 2 – Modify Knowledge Test Result form

In this task, you will be modifying the Knowledge Test Result form, so you can input some data to test your chart.

1. Make sure you are still on https://make.powerapps.com and you are in your **Practice** environment.
2. Select **Solutions**.
3. Open **Common Data Services Default Solution**.
4. Click on the **Knowledge Test Result** entity.
5. Select the **Forms** tab.
6. Open the **Information Main** form.
7. Select the **General** tab of the form.
8. Go to the **Field Explorer** and click on the **Knowledge Assessment** field. The Knowledge Assessment field will be added to the form.

9. From the **Field Explorer**, click on the **Total Points** field. The Total Points field will be added to the form.
10. Click **Save**.
11. Click **Publish** and wait for the publishing to complete.
12. Click **back** to close the form editor.

11.3.3 Task 3 – Create Records and Test the Chart

1. Make sure you are still on https:/make.powerapps.com and you are in the **Practice** environment.
2. Select **Apps**.
3. Select the **Knowledge Admin** model-driven application and click **Play**.
4. Click on the **Administration** area and select **Assessments**.
5. Select **Knowledge Test Results**.
6. Click + **New**.
7. Enter **Result One** for **Name**, **180** for **Total Points**, and click **Save**.
8. Click + **New** again.
9. Enter **Result Two** for **Name**, **250** for **Total Points**, and click **Save**.
10. Add four more records. You can provide any name you want but make sure you enter random total points.
11. Select **Knowledge Test Results** again. The **Active Knowledge Test Results** view will load.
12. Click **Show Chart**.
13. The chart will show your user's aggregated points.

11.4 lab: title: 'Lab 4.5: Build dashboards' module: 'Module 4: Build Power Apps'

12 Module 4: Build Power Apps

Lab 4.5: Practice Lab – Build dashboards

12.0.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

12.1 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You will be continuing your work on the model-driven Knowledge Admin app. In this practice, you will be creating a dashboard and modifying the app to include it.

12.2 Exercise 1 – Create a dashboard

In this exercise, you will create a dashboard using existing charts and views.

12.2.1 Task 1 – Create the dashboard

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Open the **Common Data Services Default Solution**.
5. Click **+ New** and select **Dashboard** and **2-Column Overview**. *Note:* Always pick the template that best fits what you plan to build. You can always remove some of the cells you are not using or adjust their sizes.
6. Enter **Results Overview** for Name.
7. Locate the top left quadrant of the dashboard. You will see icons in the middle of the quadrant, which are buttons allowing you to add components. In the top left quadrant, click the **Insert chart** icon, which looks like a bar graph with a plus sign.
8. Select **Knowledge Test Result** for **Record Type**.
9. Select **Active Knowledge Test Results** for **View**.
10. Select **Leader Board** for **Chart**.
11. Click **Add**.
12. Locate the top right quadrant of the dashboard. Click the **Insert list** icon, which looks like a bulleted list.
13. Select **Knowledge Assessments** for **Record Type**.
14. Select **Active Knowledge Assessments** for **View**.
15. Click **Add**.
16. Click **Save** to save the dashboard.
17. Click **Close**.
18. Click **Done**.

12.2.2 Task 2 – Edit the Knowledge Admin App

For your dashboard to show up in the model-driven app you must edit the app module and added to the definition

1. Make sure you are still in https://make.powerapps.com and you have your **Practice** environment selected.
2. Open **Common Data Services Default Solution**.
3. Click on the **Knowledge Admin** model-driven application. The app designer should open.
4. Select **Dashboards**.
5. Uncheck the **All** checkbox if it is checked.
6. Check the **Results Overview** checkbox.
7. Uncheck any other checked dashboards.
8. Go to the **Entity View** area and see if any other entities were added. If yes, select each and click **Remove**.
9. Click **Save**.
10. Click the **edit** (the pencil) icon next to Site Map.
11. Select the **Assessments** area.
12. Select the **Configuration** group.
13. Click **+ Add** and select **Subarea**.
14. Select **Dashboard** for **Type**.

15. Select **Results Overview** for **Default Dashboard**.
16. Drag the **Dashboards** subarea you just added and drop it above the **Knowledge Assessments** subarea.
17. Drag the **Assessments** area and drop it to the left of the **Administration** area to switch the order.
18. Click **Save**.
19. Click **Publish** to publish the sitemap.
20. Click **Save and Close** to close the site map designer.
21. Click **Validate** to validate your changes. You can ignore the warnings.
22. Click **Publish** to publish the application.
23. Click **Save and Close** to close the close the app designer.
24. Click **Done**. Deselect the Knowledge Admin model-driven app.
25. Click **Publish All Customizations**.

12.2.3 Task 3 – Test Your Changes

1. Make sure you are still in https://make.powerapps.com and you have the **Practice** environment selected.
2. Select **Apps**.
3. Select the **Knowledge Admin Model-Driven application** and click **Play**. (If your dashboard does not load immediately, click the **Home** button in the left menu to refresh the app.)
4. The Dashboard will load and **Results Overview** will be selected by default.

12.3 lab: title: 'Lab 4.6: Build a canvas app' module: 'Module 4: Build Power Apps'

13 Module 4: Build Power Apps

Lab 4.6: Practice Lab – Build a canvas app

13.0.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

13.1 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You have been assigned to continue work on the Fabrikam Knowledge canvas app that we started creating in the prior module. In this practice you will be starting to build out the screens and connecting to the data in the Common Data Service.

13.2 Exercise 1 – Setup the Data Sources from the Common Data Service

In this exercise, you will be associating the data sources needed with the application.

13.2.1 Task 1 - Enter data into Knowledge Admin application

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Select **Common Data Services Default Solution.**
5. Select the **Knowledge Admin** model-driven app and select **Play.**
6. Navigate to **Knowledge Assessments.** You should have three **Test Assessments** listed in your view.
7. Open **Test Assessment One.**
   - Enter a **Start date** and an **End date.**
   - Enter a **Difficulty.**
   - Navigate to the **Questions** tab.
   - Click **New Knowledge Question.**
   - Enter a question for **Question.** (Examples: What is the best color? What is the best animal? What is your job role? What technology do you work on? Use your imagination!)
   - Enter answers and answer points for four possible answers to your question. Enter some answers with negative points (wrong answers) and some with positive points (correct answers).
   - Click **Save.**
   - Repeat Step 7 for Test Assessments Two and Three. You can create multiple questions for each Test Assessment if you have time.
8. When all Test Assessments have data in the **General tab** and all have at least one associated **Question**, close the model-driven app.

13.2.2 Task 2 – Set up data sources

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Select **Common Data Services Default Solution.**
5. Select the **Fabrikam Assessment** Canvas application.
6. Click on the **Edit** button located on the command bar.
7. The app designer should open. There are 5 tabs on top of the app designer: File, Home, Insert, View, and Action. Select the **View** tab.
8. Click on the **Data Sources** button.
9. You will be presented with a list of entities. Expand to see all entites by selecting **See all entities.** Select the **Feedback**, **Knowledge Assessments**, **Knowledge Questions**, **Knowledge Test Results**, and **Users** entities. You can use the Search feature to make it quicker to find the entities.
10. The data from the entities you selected will now be available for your application. Close the **Data sources** pane.
11. Click on the **File** tab and click **Save**. Saving your work periodically is always a good idea.
12. To go back to the app designer, click on the **Back** button located on the top left of the page.
13. Do not close the App designer.

13.3 Exercise 3 – Setup screens for Knowledge Assessment and Taking Assessment

In this exercise, you will be adding a list of Knowledge Assessments to the main screen, and then adding navigation to allow employees to take the assessment.

13.3.1 Task 1 – Setup Knowledge Assessment screen

1. In the **tree view**, click on the ellipses of **mainScreen** and select **Duplicate Screen**.
2. Click on the ellipses button of the new screen and click **Rename**.
3. Rename the Screen **takeAssessmentScreen.** *Note:* It is always good to give components a good name so when you reference them later there will not be any confusion.
4. Select the **mainScreen**.
5. Select the **Insert** tab from the top command bar. Click **Gallery** and select **Horizontal**.
6. A **Data Source** pop-out will appear next to the Gallery pane to select the data source. Select **Knowledge Assessments**.
7. In the Properties tab, navigate to **Fields** and click **Edit**. Change the Subtitle to **Days Remaining** by selecting the field from the dropdown.
8. In the left-hand control tree, locate the gallery, right click and select rename. Rename the Gallery **knowledgeAssessmentList**.
9. Resize the **Gallery** so it takes all the space below the header by clicking on the gallery and dragging the image area to fit the space.
10. Select the first item of the **KnowledgeAssessmentList** gallery. Make sure you are selecting the item in the designer.
11. Click on the knowledgeAssessmentList **subtitle** control from the control tree on the left.
12. Select the **Text** property in the designer function list (fx) and paste the snippet below. This snippet will add the text " Days remaining" to the end of the number. If you have issues with the formula, try typing it out manually instead of copying and pasting.

    ```
    ThisItem.'Days Remaining' & " days remaining"
    ```

13. Depending on your test data you may have some items that currently just say "days remaining" and some that have a number (e.g., "10 days remaining").
14. With the **subtitle** on the **knowledgeAssessmentList** still selected, go to the **Insert** tab and click **Icons**.
15. Select the **+ Add** icon.
16. Move the icon to below the **days remaining** subtitle by dragging it with your mouse.
17. Select the icon. Navigate to the **Advanced** tab of the Properties pane. Select the **OnSelect** property and set it the snippet below. This snippet will let the user navigate to the Take Assessments screen when they click on the icon. If you have issues with the formula, try typing it out manually instead of copying and pasting.

    ```
    Navigate(takeAssessmentScreen, ScreenTransition.None)
    ```

Note: If the designer shows a red line under your function it could be due to the name of the screen being different. If that happens adjust the name used to be the same as your second screen.

13.3.2 Task 2 – Setup Taking Assessment screen

In this task we will be setting up the display of the questions. In subsequent practices you will be scoring and storing the results.

1. Select the **takeAssessmentScreen**.
2. With the **takeAssessmentScreen** still selected, go to the **Insert** tab, click **Gallery,** and select **Blank Horizontal**.
3. The **data source** pop-out will come into view. Close it.
4. Rename the gallery **assessmentQuestionList**.
5. Select the **assessmentQuestionList** gallery.
6. Select the **Items** property in the **Advanced** section of the Properties pane. Set it to the snippet below. This snippet will filter the Knowledge Questions for the selected Knowledge Assessment. If you have issues with the formula, try typing it out manually instead of copying and pasting.

```
Filter('Knowledge Questions', 'Knowledge Assessment'.'Knowledge Assessment' = knowledgeAssessmentL
```

7. Resize the **assessmentQuestionList** until takes all the space below the header.
8. Select the **assessmentQuestionList** gallery in the canvas.
9. Select the **Add an item from the insert pane** option within the outlined area. Select **Text label** from the **Insert** section.
10. Select the label you just added and set the **Text** property to **Question** using the formula bar. (It is possible this will be set automatically for you. Make sure to verify.)

    ```
    ThisItem.Question
    ```

11. If you don't see any questions display in your app preview, click on mainScreen and, while holding the alt key, use the mouse to click on the next icon on one of the assessment records. You should then navigate to the takeAssessment screen. If you still don't see questions show up, check in the model-driven app that you have created some test data.
12. With the label still selected, set the **X** property to **0**.
13. Select the **Y** property to **0**.
14. Select **Width** property and set it to **300**.
15. Select the **Height** property to **100**.
16. From the **Insert** tab, click **Input** and **Check box**.
17. Move the new checkbox below the Question label.
18. Select the **Text** property of the new checkbox and from the **fx** equation bar at the top, set it to **Answer 1**.

    ```
    ThisItem.'Answer 1'
    ```

19. By using the ThisItem. syntax you are referencing a data field from the current record.
20. Set the **Width** property to **300** or drag it to expand the width of the control.
21. With the check box control selected, navigate to the property panel on the right side of the screen. Select the Advanced tab and set the **OnCheck** property to the snippet below. This snippet will add the points of the check answer to a Collection name UserAnswers.

    ```
    Collect(UserAnswers, {Question:GUID(ThisItem.'Knowledge Question'), Points:ThisItem.'Answer 1 Poin
    ```

22. Set the **OnUnCheck** property to the snippet below. This snippet will remove the points of the uncheck answer form the Collection when the user unchecks the answer.

    ```
    Remove(UserAnswers, LookUp(UserAnswers, Question = GUID(ThisItem.'Knowledge Question')))
    ```

23. Select **takeAssessmentScreen**.
24. Select the **OnVisible** property and paste the snippet below. This will clear the prior answers each time they select another question.

    ```
    Clear(UserAnswers)
    ```

25. In the left control tree, select the checkBox and rename the checkbox **answer1Selected**.
26. With **answer1Selected** still selected, go to the **Insert** tab, select **Input**, and select **Check box** again. We are going to add the additional answer checkboxes and do a similar setup for each.
27. Move the new checkbox below the **answer1Selected** checkbox.
28. Select the **Text** property of the new checkbox and set it to **Answer 2**.

    ```
    ThisItem.'Answer 2'
    ```

29. Set the **Width** property to **300**.
30. Set the **OnCheck** property to the snippet below. This snippet will add the points of the check answer to the Collection.

    ```
    Collect(UserAnswers, {Question:GUID(ThisItem.'Knowledge Question'), Points:ThisItem.'Answer 2 Poin
    ```

31. Set the **OnUnCheck** property to the snippet below. This snippet will remove the points of the uncheck answer form the Collection.

    ```
    Remove(UserAnswers, LookUp(UserAnswers, Question = GUID(ThisItem.'Knowledge Question')))
    ```

32. Rename the checkbox **answer2Selected**.
33. With **answer2Selected** still selected, go to the **Insert** tab, select **Input**, and select **Check box**.
34. Move the new checkbox below the **answer2Selected** checkbox.
35. Select the **Text** property of the new checkbox and set it to **Answer 3**.

    ```
    ThisItem.'Answer 3'
    ```

36. Set the **Width** property to **300**.
37. Set the **OnCheck** property to the snippet below. This snippet will add the points of the check answer to the Collection.

    ```
    Collect(UserAnswers, {Question:GUID(ThisItem.'Knowledge Question'), Points:ThisItem.'Answer 3 P
    ```

38. Set the **OnUnCheck** property to the snippet below. This snippet will remove the points of the uncheck answer form the Collection.

    ```
    Remove(UserAnswers, LookUp(UserAnswers, Question = GUID(ThisItem.'Knowledge Question')))
    ```

39. Rename the checkbox **answer3Selected**.
40. With **answer3Selected** still selected, go to the **Insert** tab, select **Input**, and select **Check box**.
41. Move the new check box below the **answer3Selected** checkbox.
42. Select the **Text** property of the new checkbox and set it to **Answer 4**.

    ```
    ThisItem.'Answer 4'
    ```

43. Set the **Width** property to **300**.
44. Set the **OnCheck** property to the snippet below. This snippet will add the points of the check answer to the Collection.

    ```
    Collect(UserAnswers, {Question:GUID(ThisItem.'Knowledge Question'), Points:ThisItem.'Answer 4 P
    ```

45. Set the **OnUnCheck** property to the snippet below. This snippet will remove the points of the uncheck answer form the Collection.

    ```
    Remove(UserAnswers, LookUp(UserAnswers, Question = GUID(ThisItem.'Knowledge Question')))
    ```

46. Rename the checkbox **answer4Selected**.
47. Select **takeAssessmentScreen**.
48. Go to the **Insert** tab, select **Input,** and click **Button**.
49. Drag and place the button below the **assessmentQuestionList**.
50. Select the button and set the **Text** property to **Score Assessment**.
51. Make the button larger until the text doesn't wrap.
52. Click **File** and **Save**.

13.4 lab: title: 'Lab 4.7: Work with data and services' module: 'Module 4: Build Power Apps'

14 Module 4: Build Power Apps

Lab 4.7: Practice Lab – Work with data and services

14.0.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

14.1 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You have been assigned to continue work on the Fabrikam Knowledge canvas app that we started creating in the prior module. In this practice you will be working with the CDS connector to filter the list, save the results of the assessment in CDS and add support for submitting feedback using the EditForm.

14.2 Exercise 1 – Filtering Data

14.2.1 Task 1 – Filter Knowledge Assessments

In this task, you will filter the Knowledge Assessment to show only Active records that have Start Date in the past and End Date is in the future.

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Select **Common Data Service Default Solution**.
5. Select the **Fabrikam Assessment** Canvas application.
6. Click on the **Edit** button located on the command bar.
7. Wait for the app designer to load.
8. Select the **knowledgeAssessmentList** gallery and click the **Advanced** tab in the Properties pane.
9. Set the **Items** Property to the snippet below. This snippet will filter the Knowledge Assessment records and the list will show only the active records with Start Date in the past and End Date in the future. *Note:* if you type this instead of pasting it, you will see how the editor helps you build expressions.

```
Filter('Knowledge Assessments', (Status = 'Status (Knowledge Assessments)'.Active && 'Start Da
```

10. Click **File** and **Save** your changes.
11. Click on the **Back** button.
12. Do not close the app designer.

14.2.2 Task 2 – Get Current User

In this task, you will get the current User and save it in a global variable. We are doing this during OnStart so that it only happens once, and the data is available for use elsewhere in the app. We will be using this to retrieve a filtered list of test results submitted by this user.

1. In the tree view, select the **App.**
2. Select the **OnStart** property and set it to snippet below. This snippet will create a global variable **UserPrimaryEmail** that will hold the current user's email.

```
Set(UserPrimaryEmail, User().Email)
```

3. Add the snippet below to the **OnStart** property. This snippet will first terminate the first function with semicolon, get the current User and save it in a global variable name **CurrentUser**.

```
;Set(CurrentUser, LookUp(Users, 'Primary Email' = UserPrimaryEmail))
```

4. Add the following function to work around an existing bug that does not properly load the metadata for related properties. In the future this workaround will not be required.

```
;Set(FirstKABugWorkaround,First('Knowledge Test Results').'Knowledge Assessment')
```

5. Click **File** and **Save**.
6. Close the tab.
7. Select **Apps** and select the edit button to open the **Fabrikam Assessment** app in the app designer again.

14.2.3 Task 3 – Save Total Points

In this task, you will create a Patch that will create a Knowledge Test Result record. Using the Patch function allows us to on demand create a record with just specific properties being passed. In this case, we will be using the sum function to get a total of our points that are stored in our in-memory collection based on the answers the user provided.

1. Expand the **takeAssessmentScreen**.
2. Locate the button and rename it **scoreButton**.
3. While you still have the **scoreButton** selected, select the **Advanced** tab of the Properties pane. Set the **OnSelect** property to snippet below. This snippet will create a new Knowledge Test Result record. **Note:** For long formulas, you can expand the **fx** bar to format your formula in a larger view.

```
Patch('Knowledge Test Results',Defaults('Knowledge Test Results'),{'Knowledge Assessment':know
```

14.2.4 Task 4 – Add Feedback Screen

In this task, you will add a new screen to the applications. This screen will let the user submit feedback. This tasks demonstrates how to use the EditForm to create a new record.

1. Click on the ellipses button of the **takeAssessmentScreen** and click **Duplicate Screen**. We are creating a duplicate screen because we want all our screens to look the same and we don't want to recreate the header every time we add a new screen.
2. Rename the duplicate screen **addFeedbackScreen**.
3. Rename the Button on the **addFeedbackScreen** to **submitFeedbackButton**.
4. Change the **Text** property of the **submitFeebackButton** to **"Submit Feedback"**.
5. Click on the ellipses button of the **assessmentQuestionList** inside the **addFeedbackScreen** and click **Delete**.
6. Select the **addFeedbackScreen**.
7. From the **Insert** tab, click **Forms** and then click **Edit.**
8. In the Property panel on the right, select **Feedback** for **Data Source**. (If you are already on the Advanced tab, you will need to switch to the Properties tab.)
9. Go to the tree view and rename the form **feedbackForm**.
10. Resize and reposition the **feedbackForm** to your liking.
11. From the tree view, expand the **feedbackForm**.
12. Select the **Title** field. In the **Advanced** pane, select **unlock.** Expand **More options** in the **Data** section.
13. Select the **Default** property and set it to the **Title** of the selected **Knowledge assessment**.

```
knowledgeAssessmentList.Selected.Title
```

14. With the **Title** data card still selected, select the **Properties** tab. Locate the **DisplayMode** property and set it to **View**.

```
DisplayMode.View
```

15. Rename the **Comments_DataCard** to **userComments**. (You will need to click **Unlock** first.)

16. Expand the **userComments** data card and rename the **DataCardValue** to **userCommentsText**.
17. Select the **submitFeedbackButton**.
18. Replace the **OnSelect** property value with the snippet below. This snippet will submit the form, reset the form, and navigate back to the previous page.

    ```
    SubmitForm(feedbackForm);ResetForm(feedbackForm);Back(ScreenTransition.None)
    ```

19. With the **submitFeedbackButton** still selected, return to the **Properties** tab and select the **DisplayMode** property.
20. Replace the **DisplayMode** property value with snippet below. This snippet will enable the button if the comments filed has value and disable it if the comments field is blank.

    ```
    If(IsBlank(userCommentsText), DisplayMode.Disabled, DisplayMode.Edit)
    ```

21. Select the **takeAssessmentScreen**.
22. Go to the **Insert** tab, navigate to **Icons** in the top menu, and select **Left.**
23. Place the icon on the left side of the header.
24. Set the **Color** property of the icon to **White**.
25. Set the **OnSelect** property of the icon to the snippet below. This snippet will navigate back to the previous page.

    ```
    Back(ScreenTransition.None)
    ```

26. Select the **takeAssessmentScreen**.
27. Click **Insert**, navigate to **Icons** in the top menu, and select the **Emoji - Smile** icon.
28. Place the icon in the right side of the header and next to **username.**
29. Set the **Color** property of the icon to **White**.
30. Set the **OnSelect** property of the **Information** icon to the snippet below.

    ```
    NewForm(feedbackForm);Navigate(addFeedbackScreen, ScreenTransition.None)
    ```

31. Click **File** and **Save** to save your application.

14.3 lab: title: 'Lab 4.8: User experience' module: 'Module 4: Build Power Apps'

15 Module 4: Build Power Apps

Lab 4.8: Practice Lab – User experience

15.0.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

15.1 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You have been assigned to continue work on the Fabrikam Knowledge canvas app that we started creating in the prior module. In this practice you will be providing the user with visual feedback of which questions they got right and wrong. You will also be enabling the score button only if the user has provided some answers.

15.2 Exercise 1 – Customizing the User Experience

15.2.1 Task 1 – Show the Assessment Result

In this task, you will show the assessment result to the user. In this task you will use a local variable ShowResults to indicate if the results should show. It will be updated upon the user clicking the score button. Each item will then use an expression to highlight if the answer is right or wrong, only when ShowResults is true.

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Select **Common Data Services Default Solution.**
5. Select the **Fabrikam Assessment** Canvas application.
6. Click on the **Edit** button located on the command bar.
7. Wait for the app designer to load.
8. Select the **takeAssessmentScreen.**
9. Select the **OnVisible** property of the **takeAssessmentScreen** and replace the value with the snippet below. This snippet will re-add the Clear function and add a new function that will initialize a variable **ShowResults** and set it to **false**.

   ```
   Clear(UserAnswers);UpdateContext({ShowResults:false})
   ```

10. Select the **OnSelect** property of the **scoreButton**.
11. Add the snippet below to the content you currently have. This snippet will add a function that will set the **ShowResults** value to **true**.

    ```
    ;UpdateContext({ShowResults:true})
    ```

12. Select **Answer4Selected** checkbox of the **assessmentQuestionList**.
13. Select the **Fill** property of **Answer4Selected** and set it to the snippet below. This snippet will:
    - Set the Fill Color to White if ShowResults is false.
    - Set the Fill Color to Red id ShowResults is true, the checkbox is check, and the Points value is less than 0.
    - Set the Fill Color to Green id ShowResults is true, the checkbox is check, and the Points value is more than 0.

      ```
      If(ShowResults, If(answer4Selected.Value = true && ThisItem.'Answer 4 Points' > 0, Green, If
      ```

14. Select the **Fill** property of **Answer3Selected** checkbox and set to the snippet below.

    ```
    If(ShowResults, If(answer3Selected.Value = true && ThisItem.'Answer 3 Points' > 0, Green, If(answe
    ```

15. Select the **Fill** property of **Answer2Selected** checkbox and set to the snippet below.

    ```
    If(ShowResults, If(answer2Selected.Value = true && ThisItem.'Answer 2 Points' > 0, Green, If(answe
    ```

16. Select the **Fill** property of **Answer1Selected** checkbox and set to the snippet below.

    ```
    If(ShowResults, If(answer1Selected.Value = true && ThisItem.'Answer 1 Points' >  0, Green, If(answ
    ```

15.2.2 Task 2 – Disable/Enable Button

In this task, you will disable the score button if there are no answers selected and enable it when there is at least one answer selected.

1. Select the **scoreButton**.
2. With the **scoreButton** selected, set the **DisplayMode** property to the snippet below. This snippet will disable the button if there are no answers selected and enable it if there is at least one answer selected.

   ```
   If(CountRows(UserAnswers) > 0, DisplayMode.Edit, DisplayMode.Disabled)
   ```

15.2.3 Task 3 - Create the Results Screen

In this task, you will copy the Main Screen and rename it Results Screen.

1. Click on the ellipses button of mainScreen and select Duplicate Screen.
2. Click on the ellipses button of the new screen and click Rename.
3. Rename the new screen **resultsScreen**.
4. Select the **knowledgeAssessmentList** under the **resultsScreen**. Click on the ellipses button and click **Delete**.
5. Make sure the **Insert** tab is selected. Click **Gallery** and select **Horizontal**.
6. The **Data source** pop-out will come to view.
   Select **Knowledge Test Results** for data source.
7. Rename the gallery to **UserResultList**.
8. Delete the image in **UserResultList**. You will recieve an error with a red X - delete the formula in the **fx** bar to remove the error.
9. Select the **UserResultsList** gallery.
10. In the **Advanced** tab, select the **Items** property and set it to the snippet below.

    ```
    Filter('Knowledge Test Results',  Owner = CurrentUser)
    ```

11. Return to the **Property** tab. Click **Edit** on the Fields property. For Title, using the dropdown, select the **createdon** value.
12. For the Subtitle element, using the dropdown, select crxxx_totalpoints. (crxxx refers to your unique prefix.)
13. Select the **resultsScreen** and navigate to the **Insert** tab. Add the **Left** icon to the upper left corner. Change the color to **white.**
14. Set the Left icon OnSelect to this snippet.

    ```
    Back(ScreenTransition.None)
    ```

15.2.4 Task 4 – Add Button for Results Screen

In this task, you will add a button to the Main Screen. This button will navigate to the Results page.

1. Select the **mainScreen**.
2. Go to the **Insert** tab and click **Icons**.
3. Select the **... More** Icon.
4. Place the icon in the left side of the header.
5. Change the **color** of the icon to **White**.
6. Select the **OnSelect** property of the icon and provide the function below. This function will run when the icon is clicked and navigate to the Results Screen.

    ```
    Refresh(Users);Navigate(resultsScreen, ScreenTransition.None)
    ```

15.2.5 Task 5 – Test Your Work

In this task, you will run and test the applications.

1. Select the **mainScreen**.
2. Click **Play**.
3. Click on the **... More** icon.
4. You should navigate to the **Results Screen**. This page might be empty because you didn't take any tests yet.
5. Click on the **Back** button.

6. You will be taken back to the **Main Screen.**
7. Click on the take test icon of one of the **Assessments**.
8. The questions should load, and the **Score Assessment** button should be **Disabled**. This is because you must select at least one answer before you can submit your answers.

   Note: If you do not see any data, you need to use the model-driven app to create some assessment questions with answers.
9. Select some answers.
10. The **Score Assessment** button will now be enabled.
11. Click on the **Score Assessment** button.
12. The answers that have more than 0 points will become **Green** and the answers that have 0 zero points will become **Red**.
13. Click on the **Emoji** button.
14. You will be taken to the **Feedback Screen**.
15. The Submit Feedback button will be **Disabled**. This is because you must provide a comment before you can submit the feedback.
16. Provide a **Comment**.
17. The Submit Feedback will become **Enabled**.
18. Click **Submit Feedback**.
19. Your **Feedback** will be submitted, and you will navigate back to the **Assessment Screen**.
20. Click on the **Back** button.
21. You will go back to the **Main Screen**.
22. Click on the **... More** icon.
23. You will be taken to the **Results Screen**. You should see at least one result in the **Results** list.
24. Click on the **Back** button.
25. You will go back to the **Assessments Screen**.
26. Close the **Preview**.
27. Click **File** and **Save**.
28. Click **Close** to close the app designer.

15.2.6 Task 6 – Other things you can try

Now that you have built a basic canvas app that interacts with the Common Data Service, here are some things you can try on your own to make the app better. **The following steps are optional and are more advanced to challenge your learning. These are not expected or required to all be completed.**

1. Try different ways of presenting the Test Results – for example you could try the Data Grid control.
2. Add an image control to the mainScreen and show the user's profile image using User().Image. Note: You will need to setup a profile image for the user you are using for it to show more than the default image.
3. You can add an image to the Knowledge Assessment entity and then change the mainScreen list of Assessments to show the image. Note: after you add the entity image in CDS, you will need to upload an image via the model-driven app. You will also need to go to View-Data Sources and refresh the Knowledge Assessment entity metadata.
4. Think about how else you might improve the app using the knowledge you've gained during the practices. You can always Save As your app, and try any changes you want without impacting your completed work!

15.3 lab: title: 'Lab 5.1: Create users' module: 'Module 5: Build Power Automate flows'

16 Module 5: Build Power Automate flows

16.1 Lab 5.1: Practice Lab – Create users

16.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

16.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You will be continuing your work on the model-driven Knowledge Admin app. In this practice, you will be creating a dashboard and modifying the app to include it.

We need to add additional users to be able to use the application we have built. You will be adding three users to the tenant; one manager and two additional users.

Important Note: This lab will provide you with an actual Office 365 tenant and licenses for the Power Platform applications you will be using in this course. You will only be provided with one tenant for the practice labs in this course. The settings and actions you take within this tenant do not roll-back or reset, whereas the virtual machine you are provided with does reset each time you close the lab session. Please be aware that Office 365 is evolving all the time. The instructions in this document may be different from what you experience in your actual Office 365 tenant. It is also possible to experience a delay of several minutes before the virtual machine has network connectivity to begin the labs.

16.3 Exercise 1 – Add users and assign license to user

16.3.1 Task 1 – Create Users

In this task, you create users and assign licenses to them.

1. Navigate to https://admin.microsoft.com.
2. Login with your admin users, if prompted.
3. Expand **Users** and select **Active Users**.
4. Click **+ Add a User**.
5. Enter **User** for **First Name** and **One** for **Last Name**.
6. The **Display Name** will be populated for you.
7. Enter **UserOne** for **User Name**.
8. Click on the **Password**. This action will expand the password section.
9. Select the **Let me Create the Password** radio button.
10. Enter **practice@1** for **Password**.
11. **Uncheck** the **Require this User Change Their Password...** checkbox.
12. Click **Next**.
13. Uncheck the **Send Password in Email** checkbox.
14. Select **Next.** Assign the **Microsoft Power Apps Plan 2 Trial** license.
15. Click **Next.** On the next page, click **Next** again. Finally, click **Finish adding.**

16. Click **Close.**
17. Repeat steps 4-16 for a **User Two.**
18. Repeat steps 4-16 for a **Manager User.**
19. Your new users should now be on the list of active users in Office.

16.4 lab: title: 'Lab 5.2: Create security role' module: 'Module 5: Build Power Automate flows'

17 Module 5: Build Power Automate flows

17.1 Lab 5.2: Practice Lab - Create security role

17.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

17.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a project for your client Fabrikam. You will be continuing your work on the model-driven Knowledge Admin app. In this practice, you will be working with security roles.

Our users need to have security roles assigned so they can use the application we have built. Let's evaluate the default role to see if it's a good fit. We notice there's nothing for our custom entities. After we determine what changes should be made we will copy from an existing role and create a new role for users. Once created, we will assign the new role to our users. We will then create and assign an application manager role.

Important Note: This lab will provide you with an actual Office 365 tenant and licenses for the Power Platform applications you will be using in this course. You will only be provided with one tenant for the practice labs in this course. The settings and actions you take within this tenant do not roll-back or reset, whereas the virtual machine you are provided with does reset each time you close the lab session. Please be aware that Office 365 is evolving all the time. The instructions in this document may be different from what you experience in your actual Office 365 tenant. It is also possible to experience a delay of several minutes before the virtual machine has network connectivity to begin the labs.

17.3 Exercise 1 – Evaluate and Create Security Roles

17.3.1 Task 1 – Evaluate Security Role

In this task, you will evaluate the Common Data Service User security role.

1. Navigate to https://admin.powerplatform.microsoft.com/.
2. Select the **Environments**.
3. Select the **Practice** environment and click **Settings**.
4. Locate the **Users + Permissions** section and click **Security Roles.**
5. Click to select the **Common Data Service User** security role and click **Edit.**
6. Select the **Core Records** tab.
7. Scroll down and see the privileges the **Common Data Service User** security role has to the **Core Records**.
8. Select the **Custom Entities** tab.

9. You will find that the **Common Data Service User** security role doesn't have access to any of the custom entities you created.

17.3.2 Task 2 – Copy from Existing Security Role

In this task, you will create a new security role by copying from the Common Data Service User security role.

1. Click on the **Actions** button and select **Copy Role...**
2. Enter **Knowledge Assessment User** for **Name** and click **OK**.
3. The new security role will open. (You may need to allow pop-ups depending on your browser. If it does not open in a new window, you can return to your list of Security Roles, refresh, and find Knowledge Assessment User. Select the role, select edit, and your new security role will open.) Select the **Custom Entities** tab.
4. Locate the **Knowledge Assessment** entity and click on the Read access circle. The security role will get **User** access to the **Knowledge Assessment** entity. Users with this security role will have **Read** privilege to the records owned by the user or are shared with the user.
5. Click on the **Read** access circle again. The security role will now get **Business Unit** access. Users with this security role will get **Read** access to all records owned by the business unit the user belongs to.
6. Click the **Read** access circle again. The security role will now get **Parent: Child Business Units access**. Users with this security role will get **Read** access to all records owned by the business unit the user belongs to and all its child business units.
7. Click on the **Read** access circle one more time. The security role will now get **Organization** access. Users with this security role will get **Read** access to all records owned by the organization.
8. Locate the **Knowledge Question** entity and click on the **Read** access circle four times. This action will give the security role **Organization** Read access to the **Knowledge Question** entity.
9. Locate the **Knowledge Test Result** entity and click on the **Create** circle one time.
10. Locate the **Read** circle of the **Knowledge Test Result** entity and click Four times.
11. Locate the **Write** circle of the **Knowledge Test Result** entity and click one time.

    The security role will get organization-wide level Read privilege and user- level Create/Write privileges to the Knowledge Test Result entity.
12. Select the **Core Records** tab.
13. Locate the **Feedback** entity and click on the **Create** circle one time and click on the **Write** circle one time.
14. Click **Save and Close**.
15. Close the Common Data Service User security role. Do not close the security roles window.

17.3.3 Task 3 – Create Security Role

In this task, you will create a new security role for the application manager.

1. Make sure you are still on the **Roles** window and click **New role**.
2. Enter **Knowledge Application Manager** for **Role Name**.
3. Select the **Custom Entities** tab.
4. Locate the **Knowledge Assessment** entity and click on the entity name four times. The security role will get organization level of all privileges.
5. Locate the **Knowledge Question** entity and click on the entity name four times. The security role will get organization level of all privileges.
6. Locate the **Knowledge Test Result** entity and click on the entity name four times. The security role will get organization level of all privileges.
7. Select the **Core Records** tab.

8. Locate the **Feedback** entity and click on the entity name four times. The security role will get organization level of all privileges.
9. Click **Save and Close**.
10. Close the Roles window.

17.4 lab: title: 'Lab 5.3: Configure a new business rule' module: 'Module 5: Build Power Automate flows'

18 Module 5: Build Power Automate flows

18.1 Lab 5.3: Practice Lab – Configure a new business rule

18.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

18.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a model-driven Knowledge Admin app for your client Fabrikam. In this lab, you will create fields and use business rules to control visibility of the fields without needing custom code.

18.3 Exercise 1 - Prepare the solution

18.3.1 Task 1 – Add Fields to Knowledge Question

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions**.
4. Click to open the **Common Data Services Default Solution.**
5. Click to open the **Knowledge Question** entity.
6. Select the **Fields** tab and click **+ Add Field**.
7. Enter **Question Type** for **Display Name** and select **Option Set** for **Data Type**.
8. Click on the **Option Set** dropdown and click **+ New Option Set**.
9. Enter **Simple** and click **Add New Item**.
10. Enter **Scenario** and click **Save**.
11. From the **Required** dropdown, select **Required.**
12. Click **Done.** Then click **Save entity.**
13. Click **+ Add Field**.
14. Enter **Scenario Description** for **Display Name**, select **Text Area** for **Data Type**, and click **Done**.
15. Click **Save Entity**.

18.3.2 Task 2 – Add Fields to Knowledge Question Form

1. Make sure you still have the **Knowledge Question** entity selected.
2. Select the **Forms** tab and click to open the **Main** form.
3. Drag the **Question Type** field from the fields explorer and drop it above the **Question** field on the form.
4. Drag the **Scenario Description** field from the fields explorer and drop it below the **Question Type** field.
5. With **Scenario Description** selected, check **Hide.**
6. Uncheck **Show only unused fileds** and drag the **Knowledge Assessment** field from the fields explorer and drop it below the **Owner** field on the form.
7. Click **Save**.
8. Click **Publish**.
9. Click **Back.**
10. Click on the solution name **Common Data Services Default Solution** located in the navigation breadcrumbs. Click **Publish all customizations.**

18.4 Exercise 2 – Create Business Rule

18.4.1 Task 1 – Create Question Type Business Rule

1. Navigate to https://make.powerapps.com
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions.**
4. Click to open the **Common Data Services Default Solution.**
5. Click to open the **Knowledge Question** entity.
6. Select the **Business Rules** tab and click **Add Business Rule**.
7. Next to **New business rule** at the top of the screen, select the dropdown carrot.
8. Enter **Question Type Rule** for **Business Rule Name**.
9. Select the **Condition** and enter **Check Question Type** for **Display Name.**
10. Go to the **Rule** section, select **Question Type** for **Field**, select **Equals** for **Operator**, select **Value** for **Type**, and select **Scenario** for **Value**.
11. Click **Apply**.
12. Select the **Components** tab.
13. Drag **Set Visibility** action and place it on the **True** side (on the right side) of the condition.
14. Enter **Show Scenario Description** for **Display Name**, select **Scenario Description** for **Field**, select **Yes** for **Visible** and click **Apply**.
15. Select the **Components** tab.
16. Drag **Set Business Required** action and place it after the **Show Scenario Description** action.
17. Select the new action, enter **Make Scenario Required** for **Display Name**, select **Scenario Description** for **Field**, select **Business Required** for **Status** and click **Apply**.
18. Drag **Set Visibility** action and place it on the **False** side (below) of the condition.
19. Enter **Hide Scenario Description** for **Display Name**, select **Scenario Description** for **Field**, select **No** for **Visible** and click **Apply**.
20. Select the **Components** tab.
21. Drag **Set Business Required** action and place it after the **Hide Scenario Description** action.
22. Select the new action, enter **Remove Scenario Requirement** for **Display Name**, select **Scenario Description** for **Field**, select **Not Business Required** for **Status** and click **Apply**.

23. Select the **Components** tab.
24. Drag **Set Field Value** action and place it after the **Remove Scenario Requirement** action.
25. Select the new action, enter **Clear Field** for **Display Name**, select **Scenario Description** for **Field**, select **Clear** for **Type** and click **Apply**.
26. Change the **Scope** to **All Forms**. You can find the Scope in the command bar.
27. Click **Save**.
28. Click **Activate**.
29. Confirm activation.
30. Close the business rule designer.
31. Click **Done**.

18.4.2 Task 2 – Test Business Rule

1. Navigate to https://make.powerapps.com/ and make sure you are in your **Practice** environment.
2. Select **Apps** and click on the **Knowledge Admin** Model-Driven application.
3. Select **Knowledge Assessments** and click **+ New**.
4. Enter **Test Assessment Four** for **Title**, select today's date for **Start Date**, a month from today for **End Date**, and click **Save**.
5. Select the **Questions** tab.
6. Click **+ New Knowledge Question**.
7. Type **Test Question** for **Question**.
8. Select **Scenario** for **Question Type**. The **Scenario** field will come to view, and it will be required.
9. Type **This is a test Scenario** in the **Scenario Description**.
10. Change the **Question Type** to **Simple**. The Scenario field will disappear.
11. Change the **Question Type** back to **Scenario**. The **Scenario Description** will come to view again and the text you entered will no longer be there.
12. Type **This is a test Scenario** for **Scenario Description**.
13. Scroll down to the **Answers** section, enter **Test Answer One** for **Answer 1**, enter **20** for **Answer 1 Points.**
14. Click **Save**. You can close the model-driven app.

18.5 lab: title: 'Lab 5.4: Advanced business rules' module: 'Module 5: Build Power Automate flows'

19 Module 5: Build Power Automate flows

19.1 Lab 5.4: Practice Lab – Advanced business rules

19.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

19.2 Scenario

You are a functional consultant for your organization Contoso. You are assigned to work on a model-driven Knowledge Admin app for your client Fabrikam and need to add scoring functionality without code. In this lab, you will create a calculated field, a rollup field, and a business rule.

19.3 Exercise 1 – Prepare the Solution

19.3.1 Task 1 – Add Field to Knowledge Question

1. Navigate to https://make.powerapps.com.
2. Select the **Practice** environment you created.
3. Select **Solutions**.
4. Click to open the **Common Data Services Default Solution**.
5. Click to open the **Knowledge Question** entity.
6. Select the **Fields** tab and click **+ Add Field**.
7. Enter **Question Points** for **Display Name** and select **Whole Number** for **Data Type**.
8. Click **+ Add** next to **Calculation or Rollup** and select **+ Calculation**.
9. Click **Save**.
10. On the **Set Question Points** popup, click **+ Add Action**.
11. Type **answer1points** and select the suggested field.
12. Type **+** , type **answer2points** and select the suggested field.
13. Repeat it for **answer3points** and **answer4points**. You action will look like the snippet below but with your unique organizational prefix.

    ```
    cre7f_answer1points + cre7f_answer2points + cre7f_answer3points + cre7f_answer4points
    ```

14. Save the action by clicking on the checkmark button.
15. Click **Save and Close**.
16. Click **Done**.

19.3.2 Task 2 – Add Field to Knowledge Question Form

1. Make sure you still have the **Knowledge Question** entity selected.
2. Select the **Forms** tab and click to open the **Main** form.
3. Drag the **Question Points** field from the fields explorer and drop it below the **Knowledge Assessment** field on the form.
4. Click **Save**.
5. Click **Publish**.
6. Click the back button.
7. Click on the solution name located in the navigation breadcrumbs.
8. Click **Publish all customizations.**

19.3.3 Task 3 – Add Field to Knowledge Assessment

1. Click on the **...** button located in the command bar and click **Switch to Classic**.
2. Expand **Entities**, expand the **Knowledge Assessment** entity, select **Fields**, and click **New**.
3. Enter **Total Points** for **Display Name**, select **Whole Number** for **Data Type**, select **Rollup** for **Field Type**, and click **Edit**. (Your rollup editor will open in a new window. You may need to allow pop-ups.)
4. Click **+ Add Related Entity**.

5. Select **Knowledge Questions** for **Related** and click the checkmark.
6. Click **+ Add Aggregation**.
7. Select **SUM** for **Aggregation Function**, select **Question Points** for **Aggregated Related Entity Field**, and click the checkmark.
8. Click **Save and Close**.
9. Click **Save and Close** again.
10. Click **Publish All Customizations**.
11. Close the solution explorer.

19.3.4 Task 4 – Add Field to Knowledge Assessment Form

1. Select the **Knowledge Assessment** entity.
2. Select the **Forms** tab and click on the Main form.
3. Drag the **Total Points** field from the fields explorer and drop it below the **Difficulty** field on the form.
4. Click **Save**.
5. Click **Publish**.
6. Click the back button.
7. Click on the solution name located in the navigation breadcrumbs.
8. Click **Publish all customizations**.

19.4 Exercise 2 – Create Business Rule

19.4.1 Task 1 – Create Question Points Business Rule

1. Click to open the **Knowledge Question** entity.
2. Select the **Business Rules** tab and click **Add Business Rule**.
3. Click on the carrot button next to **Knowledge Question:New business rule.**
4. Enter **Question Points Rule** for **Business Rule Name** and click on the carrot again to hide details.
5. Select the **Condition** and enter **Check Question Points** for **Display Name.**
6. Go to the **Rules** section, select **Answer 1 Points** for **Field**, select **Is Less Than or Equals to** for **Operator**, select **Value** for **Type**, enter **0** for **Value**, and click **Apply**.
7. Above the rule you just created, there is a **+ New** button to add a new rule. Click **+ New** to add a new rule in addition to the first rule.
8. Go to the **Rule 2**, select **Answer 2 Points** for **Field**, select **Is Less Than or Equals to** for **Operator**, select **Value** for **Type**, enter **0** for **Value**, and click **Apply**.
9. Click **+ New** rule.
10. Go to the **Rule 3**, select **Answer 3 Points** for **Field**, select **Is Less Than or Equals to** for **Operator**, select **Value** for **Type**, enter **0** for **Value**. And click **Apply**.
11. Click **+ New** rule.
12. Go to the **Rule 4**, select **Answer 4 Points** for **Field**, select **Is Less Than or Equals to** for **Operator**, select **Value** for **Type**, enter **0** for **Value**, and click **Apply**.
13. Select the **Components** tab.
14. Drag **Show Error Message** action and place it in **True** side of the Condition.
15. Select the action, enter **Show Points Error Message** for **Display Name**, select **Question** for **Field**, enter **At least one answer must have points more than zero**, and click **Apply**.
16. Click **Save**.
17. Click **Activate**.

18. Confirm the activation.
19. Close the business rule designer.
20. Click **Done**.

19.4.2 Task 2 – Test Business Rule

1. Navigate to https://make.powerapps.com/ and ensure that you are in your **Practice** environment.
2. Select **Apps** and click on the **Knowledge Admin** model-driven application.
3. Select **Assessments** and click to open the **Test Assessment Four**.
4. Select the **Questions** tab.
5. Click **+ New Knowledge Question**.
6. The error message for the points requirement will be displayed on the Question field.
7. Type **Test Two Question** for **Question**.
8. Select **Simple** for **Question Type**.
9. Click **Save**. You will not be able to save because of the points requirement.
10. Scroll down to the **Answers** section, enter **Test Answer One** for **Answer 1**, enter **20** for **Answer 1 Points.** The points requirement error will go away.
11. Click Save. The record will now be saved.
12. Scroll down to the **Answers** section again, enter **Test Answer Two** for **Answer 2**, and **0** for **Answer 2 Points**.
13. Enter **Test Answer Three** for **Answer 3**, and **10** for **Answer 3 Points**.
14. Enter **Test Answer Four** for **Answer 4**, and **50** for **Answer 4 Points**.
15. Click **Save.** Scroll up and locate the **Question Point** field. The calculated points should show in this field.
16. Click **+ New**.
17. Select **Test Assessment 4** for **Knowledge Assessment**, select **Simple** for **Question Type**, and enter **Test Three Question** for **Question**.
18. Scroll down to the Answers section.
19. Enter **Test Three Answer One** for **Answer 1**, and **25** for **Answer 1 Points**.
20. Enter **Test Three Answer Two** for **Answer 2**, and **80** for **Answer 2 Points**.
21. Enter **Test Three Answer Three** for **Answer 3**, and **10** for **Answer 3 Points**.
22. Enter **Test Three Answer Four** for **Answer 4**, and **0** for **Answer 4 Points**.
23. Click **Save and Close**.
24. Locate the **Knowledge Assessment** field and click **Test Assessment 4**.
25. Scroll down to locate the **Total Points** field and click on the calculator icon.
26. Click **Recalculate**.
27. The field should now show the total points of all the questions.
28. You can close your model-driven app.

19.5 lab: title: 'Lab 5.5: Create a flow' module: 'Module 5: Build Power Automate flows'

20 Module 5: Build Power Automate flows

20.1 Lab 5.5: Practice Lab – Create a flow

20.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

20.2 Scenario

As a functional consultant at Contoso, you are you continuing to work on a model-driven Knowledge Admin app for your client Fabrikam. Your client has requested an automation that should run weekly without user involvement. You can't schedule a workflow without custom code so you will need to use a Microsoft Power Automate flow. In this lab, you will create a flow to run weekly and test the flow.

20.3 Exercise 1 – Create Microsoft Power Automate flow

In this exercise, you will create a flow that will run once a week. This flow will check if there are Knowledge Assessment with End Date of today or older and deactivate them.

20.3.1 Task 1 – Create a flow

2. Make sure you have your **Practice** environment selected.
3. Select **Solutions** and click to open the **Common Data Services Default Solution.**
4. Locate the Name column and make a note of the name **Prefix**. The prefix will look like **crXXX_**.
5. From the lefthand menu, select **Flows.** (If you get a pop-up here, just choose your country/region and select **Get started.**)
6. Click **+ New** and select **+ Automated - From Blank**.
7. The pop-up will show common triggers that you can easily select to jumpstart your flow configuration. Scroll through the options, but do not select anything. When you are ready, press **Skip.**
8. In the box that says **Search connectors and triggers**, type **Recurrence.** Select the **Recurrence** option from the **Triggers** tab.
9. Select **+ New step.**
10. Type **Common Data Service** into the search box.
11. Select **List records** from the **Actions** box.
12. Select **Knowledge Assessments** for Entity.
13. Click on **Show advanced options.**
14. Select the **Filter Query** field and type the following:

    ```
    crXXX_enddate lt
    ```

    Replace crXXX_ with your unique prefix and type a **space** at the end of the expression.
15. Select the **Expression** of the **Dynamics Content** pane.
16. Type **utcNow()** and click **OK.** (There should be a space before the utcnow() expression.)
17. Click on the **... Menu** button of the step and select **Rename**.

18. Rename the step **Get Assessments**.
19. Click **+ New Step**.
20. Search for **Common Data Service** and select **Update a Record**.
21. If required, select your environment. Then select **Knowledge Assessments** for **Entity Name**. Depending on your UI, you will then either see **Item ID** or **Record Identifier.** Select this field.
22. Select **Knowledge Assessment** from the **Dynamic Content** pane.
23. **Apply to Each** step will be added and **Value** will be selected for Output. Click on **Update a record** and then click **Show Advanced Options** if it is not already expanded.
24. Locate the **Status** option set and select **Inactive**.
25. Click on the **... Menu** button of the step and select **Rename**.
26. Rename the step **Deactivate Assessment**.
27. Scroll up and click on the name of the flow by clicking **Untitled.**
28. Rename the flow **Deactivate Old Assessments**.
29. Click **Save**. Don't navigate away from the flow.

20.3.2 Task 2 – Test your flow

1. Start a new browser window and navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Apps** and click to open the **Knowledge Admin** model-driven application.
4. Select **Assessments** and click to open the **Test Assessment Four**.
5. Locate the **End Date** field and select today's date.
6. Click **Save**.
7. Go back to the flow you created.
8. Click **Test**.
9. Select **Using Data from Previous Runs.**
10. Select the latest run and click **Test**.
11. The flow should run and succeed.
12. Go back to the **Knowledge Admin** application.
13. Select **Assessments**.
14. **Test Assessment Four** should now be missing from the view.
15. Click on the view name and select the **Inactive Knowledge Assessments** view.
16. The deactivated record will now be in this view.
17. Go back to flow and click **Edit**.
18. Click on the Recurrence trigger.
19. Change the **Recurrence** from **Minute** to **Week**.
20. Click **Save**.
21. Go back to the **Knowledge Admin** application.
22. Select **Assessments**.
23. Click on the view name and select the **Inactive Knowledge Assessments** view.
24. Click to open the **Test Assessment Four** record.
25. Click **Activate**.
26. Confirm activation.

27. Change the **End Date** to one month from today.
28. Click **Save**.

20.4 lab: title: 'Lab 5.6: Build approval flow' module: 'Module 5: Build Power Automate flows'

21 Module 5: Build Power Automate flows

21.1 Lab 5.6: Practice Lab – Build approval flow

21.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

21.2 Scenario

Your client Fabrikam needs an approval process added to their model-driven Knowledge Admin app. The approval process will notify the user's manager to obtain an approval or rejection and handle the knowledge assessment appropriately.

In this lab, you will create a **Microsoft Power Automate** flow to retrieve the appropriate manager, seek their approval, and edit the record based on the manager's decision.

21.3 Exercise 1 – Prepare the solution

21.3.1 Task 1 – Add field to the Knowledge Assessment

1. Navigate to https://make.powerapps.com.
2. Ensure you are in the **Practice** environment you created.
3. Click **Solutions**.
4. Click to open the **Common Data Services Default Solution.**
5. Click to open the **Knowledge Assessment** entity.
6. Click select the **Fields** tab and click **+ Add Field**.
7. Create the field to the following specification:
    - Enter **Notify Manager** for **Display Name**.
    - Choose **Two Options** for **Data Type**.
    - Click **Done**.
8. Click **Save Entity**.
9. Click **+ Add Field**.
10. Create the field to the following specification:
    - Enter **Approval Status** for **Display Name**.
    - Choose **Option Set** for **Data Type**.
    - Click on the **Option Set** dropdown and choose **New Option Set**.
    - Enter **Waiting** for the first item and click **Add New Item**.
    - Enter **Approved** for the second item and click **Add New Item**.
    - Enter **Rejected** for the third item and click **Save**.
    - Click **Done**.

11. Click **Save Entity**.

21.3.2 Task 2 – Add Field to Knowledge Assessment Form

1. Make sure you still have the **Knowledge Assessment** entity selected.
2. Select the **Forms** tab and click on the Main form.
3. Add the **Notify Manager** field to the form.
4. Add the **Approval Status** field to the form.
5. Click **Save**.
6. Click **Publish**.
7. Click the back button.
8. Click on the solution name located in the navigation breadcrumbs.
9. Click **Publish All Customizations**.

21.4 Exercise 2 – Create flow

21.4.1 Task 1 – Create flow

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment you created.
3. Select **Flows** and click **+New.** Select **+Automated - from blank.** In the pop-up, select **Skip.**
4. Type into the search box **Common Data Service**. You will see two options for a Common Data Service connector: Common Data Service and Common Data Service (current environment). Select only Common Data Service and then select **When record is updated.**
5. Select your environment. Select **Knowledge Assessments** for **Entity Name**, and select **Business Unit** for **Scope**.
6. Click **Show Advanced Options**.
7. Select **NotifyManager** for Attribute Filter. It will show up with your environment prefix.
8. Click on the **... Menu** button and select **Rename**.
9. Rename the step **When Assessment is Updated**.

21.4.2 Task 2 – Add Condition

1. Click **+ New Step**.
2. Search for **Condition** and select **Condition** control.
3. Click on the **Choose a Value** field and select **Notify Manager** from the **Dynamic Content** pane.
4. Select **is equal to** for operator.
5. Select the last field and type **true**.
6. Click on the **... Menu** button of the condition and select **Rename**.
7. Rename the condition **Check Notification.**

21.4.3 Task 3 – Update Waiting Assessment

1. Click **Add an Action** in the **If Yes** branch.
2. Click **Common Data Service** (not Common Data Service (current environment)) and select **Update a record**.
3. Select your Practice environment, select **Knowledge Assessments** for **Entity Name**, and click on the **Record Identifier** field.
4. Select **Knowledge Assessment** from the **Dynamic Content** pane.

5. Click **Show Advanced Options.**
6. Locate the **Approval Status Value** field and select **Waiting**.
7. Click on the **... Menu** button of the step and select **Rename**.
8. Rename the step **Update Waiting Assessment**

21.4.4 Task 4 – Get User

1. Click **Add an Action** of the **If Yes** branch.
2. Select **Common Data Service** (not Common Data Service (current environment)) and select **Get a Record**.
3. Select your environment, select **Users** for **Entity Name**, and click on the **Item ID** or **Record identifier** field.
4. Select **Created By (Value)** from the **Dynamic Content** pane.
5. Click on the **... Menu** button of the **Get a Record** step and select **Rename**.
6. Rename the step **Get Created User**.

21.4.5 Task 6 – Start Approval

1. Click **Add an Action** to the **If Yes** branch.
2. Search for **Approvals** and select **Start and wait for an approval**.
3. Select **Approve/Reject – First to respond** for **Approval Type**.
4. Enter **Manager Notification Approval** for **Title**.
5. You will usually send the approval request to a manager or other decision makers, but in this lab, you will select the user you are logged in as. Select the **Assigned To** field.
6. Go to the **Dynamic Content** pane and scroll to the **Get Created User** section.
7. Select **Primary Email** from the **Get Created User** section.
8. From the Advanced Options, select the **Requestor** field. Go to the **Dynamic Content** pane, search for **Primary Email**, and select **Primary Email** from the **Get Created User** section.
9. Select the Details field, go to the **Dynamic Content** pane, search for **Full Name**, and select **Full Name** from the **Get Created User** section.
10. Add a comma after the **Full Name** and type **created an assessment that requires manager's approval.**
11. Press the enter key to start a new line.
12. Type **Assessment Name:**
13. Go to the **Dynamic Content** pane, search for **Title**, and select **Title** from the **When Assessment is Updated** section.
14. Press enter key to start a new line.
15. Type **Manager:**
16. Go to the **Dynamic Content** pane, search for **Full Name**, and select **Full Name** from the **Get Created User** section.
17. It is good practice to include a link to the record that needs the approval. Start a new browser window and navigate to make.powerapps.com.
18. In your new window, make sure you are in your **Practice** environment.
19. Select **Apps** and click to open the **Knowledge Admin** application.
20. Open any assessment.
21. Find the **Pop Out** button located in bottom left of the form and click on it. (It will be in the bar at the very bottom of the page, and will be next to the status of the record.)

22. A new window will open. Copy the **URL** of the window.
23. Open a notepad and paste the URL.
24. The **URL** will look like the link below.

    https://practice.crm.dynamics.com/main.aspx?appid=97595509-8a00-458d-856d-1569b42d6282&pagetype=entityrecor
    74f9-e811-a950-000d3a1bc3f6
25. Copy everything before the last GUID.

    https://practice.crm.dynamics.com/main.aspx?appid=97595509-8a00-458d-856d-1569b42d6282&pagetype=entityrecor
26. Go back to the flow and select the Item Link field.
27. Paste the **URL** you copied.
28. Go to the **Dynamic Content** pane, search for **Knowledge Assessment** and select **Knowledge Assessment** from either section.

21.4.6 Task 7 – Add Condition

1. Click **Add an Action** of the **If Yes** branch.
2. Search for **Condition** and select **Condition** control.
3. Click on the first Choose a Value field and select **Outcome** from the Dynamic Content pane.
4. Leave **Is Equals to** as the operator.
5. Click on the **Choose a Value** field and type **Approve**.
6. Click on the **... Menu** button of the condition and select **Rename**.
7. Rename the condition **Check Response**.

21.4.7 Task 8 – Update Approved Assessment

1. Click **Add an Action** of the **If Yes** branch of the **Check Response** condition.
2. Search for **Common Data Service** and select **Update a Record**.
3. Select **Knowledge Assessments** for **Entity Name** and click on the **Record Identifier** field.
4. From the **Dynamic Content** pane, select **Knowledge Assessment** from either section.
5. Click **Show Advanced Options**.
6. Locate the **Approval Status Value** field and select **Approved**.
7. Click on the **... Menu** button of the step and select **Rename**.
8. Rename the step **Update Approved Assessment**.

21.4.8 Task 9 – Update Rejected Assessment

1. Click **Add an Action** of the **If No** branch of the **Check Response** condition.
2. Select **Common Data Service** and select **Update a Record**.
3. Select **Knowledge Assessments** for **Entity Name** and click on the **Record Identifier** field.
4. Select **Knowledge Assessment** from the **Dynamic Content** pane.
5. Click **Show Advanced Options**.
6. Locate the **Approval Status Value** field and select **Rejected**.
7. Click on the **... Menu** button of the step and select **Rename**.
8. Rename the step **Update Rejected Assessment**.
9. Click **Save** to save the flow.

21.4.9 Task 10 – Test flow

1. Navigate to https://make.powerapps.com
2. Make sure you are in your **Practice** environment.
3. Select **Apps** and click to open the **Knowledge Admin** application.
4. Select **Assessment** and click to open the **Test Assessment**.
5. Locate the **Approval Status** and make sure no value is selected.
6. Locate the **Notify Manager** field and set it to **Yes**. Set **Approval Status** to **Waiting.**
7. Click **Save**.
8. Click **Refresh**.
9. Navigate to https://flow.microsoft.com
10. Login if prompted.
11. Make sure you are in your **Practice** environment.
12. Expand **Action items** and select **Approvals**.
13. You should see an approval with the title **Manager Notification Approval**. Click on the approval tile.
14. The approval pane will open. Make sure the information in the details is what you expected.
15. Click on the **Link**.
16. The Knowledge Assessment record should open.
17. Close the Knowledge Assessment.
18. Click **Approve**.
19. Add **Comment** and click **Confirm**.
20. Close the approval pane.
21. Select the **History** tab.
22. The approval should show up in this list as **Approved**.
23. Go back to the **Knowledge Admin** app.
24. Refresh the test assessment.
25. The **Approval Status** field should be set to **Approved**.

21.5 lab: title: 'Lab 5.7: Build a business process flow' module: 'Module 5: Build a Power Automate flow'

22 Module 5: Build a Power Automate flow

22.1 Lab 5.7: Practice Lab – Build a business process flow

22.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

22.2 Scenario

You have been building automations to support your client Fabrikam's knowledge assessment process. The client is concerned that their users won't be able to create new knowledge assessments without your help. You need to create a guided process to interact with the user and support their configuration of new assessments. In this lab, you will enable the knowledge assessment entity for business process flows and then build a business process flow.

22.3 Exercise 1 – Prepare the Solution

22.3.1 Task 1 – Add Field to Knowledge Assessment

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment you created.
3. Select **Solutions**.
4. Click to open the **Common Data Services Default Solution**.
5. Click to open the **Knowledge Assessment** entity.
6. Click select the **Fields** tab and **+ Add Field**.
7. Enter **Passing Score (%)** for **Display Name**, select **Whole Number** for **Data Type** and click **Done**.
8. Click **Save Entity**.
9. Click **+ Add Field**.
10. Enter **Create Questions** for **Display Name** and select **Two Options** for **Data Type**.
11. Click on the **Yes** option under **Items** and replace **Yes** with **Completed**.
12. Click on the **No** option under **Items** and replace **No** with **Mark Complete**.
13. Click **Done**.
14. Click **Save Entity**.

22.3.2 Task 2 – Add Field to Knowledge Assessment Form

1. Make sure you still have the **Knowledge Assessment** entity selected.
2. Select the **Forms** tab and click on the Main form.
3. Add the **Passing Score (%)** field to the form.
4. Click **Save**.
5. Click **Publish**.
6. Click the back button.
7. Click on the solution name **Common Data Services Default Solution** located in the navigation breadcrumbs.
8. Click **Publish All Customizations**.

22.4 Exercise 2 – Create Business Process Flow

22.4.1 Task 1 – Create Business Process Flow

1. Navigate to make.powerapps.com and make sure you are in your **Practice** environment.
2. Click **Flows.**
3. Switch to the **Business Process Flows** tab.
4. Click **+New.**
5. Enter **Assessment Process** for Flow Name and choose **Knowledge Assessment** for entity.
6. Click **Create.**

7. Select the stage, select the **Properties** tab, enter **Knowledge Assessment** for **Display Name** and click **Apply**.
8. Click the **Details** of the **Knowledge Assessment** stage.
9. Select the **Data Step #1**.
10. Select **Passing Score (%)** for **Data Field** and click **Apply**.
11. Click **+ Add** and select **Add Data Step**.
12. Click on the + below the **Passing Score (%)** step.
13. Select the **New Step**, select **Total Points** for **Data Field**, and click **Apply**.
14. Select the **Components** tab, drag **Data Step** from the **Components** tab, and drop it below the **Total Points** step.
15. Select **Notify Manager** for **Data Field** and click **Apply**.
16. Drag **Data Step** from the **Components** tab and place it below the **Notify Manager** step.
17. Select **Create Questions** for **Data Field**, check the **Required** checkbox, and click **Apply**.
18. Add the new stage to the right of the **Knowledge Assessment** stage by dragging from the components tab.
19. Select the new stage, go to the **Properties** tab, enter **Activate** for **Display Name**, and click **Apply**.
20. Click **Details** of the **Activate** stage.
21. Select the **Data Step** inside the **Activate** stage.
22. Select **Status** for **Data Field** and click **Apply**.
23. Select the Components tab, drag Data Step, and place it below the Status step.
24. Select **Approval Status** for **Data Field** and click **Apply**.
25. Click **Save** to save the **Business Process Flow**.
26. Click **Activate**.
27. Confirm activation.
28. Close the process editor.

22.4.2 Task 2 – Test Business Process Flow

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Apps** and click to open the **Knowledge Admin** application.
4. Select **Assessment** and click to open the **Test Assessment Four**.
5. Existing records will not pick up the Business Process Flow you created. Click **Process** and select **Switch Process**.
6. Select the **Assessment Process** you created and click **OK**.
7. The **Assessment Process** should now be visible on the record.
8. Click **+ New**.
9. New records should show the new Business Process Flow immediately.
10. Enter **BPF Test Assessment** for **Title** and click **Save**.
11. Select the **Questions** tab and click **+ New Knowledge Question**.
12. Select **Simple** for **Question Type**.
13. Enter **Process Test Question One** for **Question**.
14. Enter **Answer One** for **Answer 1**, **50** for **Answer 1 Points**.

15. Enter **Answer Two** for **Answer 2**, **80** for **Answer 2 Points**.
16. Enter **Answer Three** for **Answer 3**, **0** for **Answer 3 Points**.
17. Enter **Answer Four** for **Answer 4**, **0** for **Answer 4 Points**.
18. Click **Save**.
19. Click on the browser back button.
20. Click on the **Knowledge Assessment** stage of the Business Process Flow. The steps for this stage will come into view in a pop-up from the Business Process Flow bar.
21. In the window for the Knowledge Assessment stage, enter **80** for **Passing Score**.
22. Click on the **Total Points** calculator icon.
23. Click **Recalculate**.
24. The **Total Points** should get recalculated.
25. Select **Yes** for **Notify Manager**.
26. Select **Completed** for **Create Questions**. Then click **Next stage.**
27. The process should move to the **Activate** stage.
28. Start a new browser window and navigate to https://flow.microsoft.com.
29. Expand **Action Items** and select **Approvals**.
30. You should have one approval waiting for you. Click on the approval.
31. The Approval pane will open. Click **Approve**.
32. Provide **Comments** and click **Confirm**.
33. Go back to **Knowledge Admin** application and click on the **Refresh** button.
34. Click on the **Activate** stage of the Business Process Flow.
35. The Approval Flow should complete the approval and set the **Approval Status** to **Approved**.

22.5 lab: title: 'Lab 5.8: Build a branching business process flow' module: 'Module 5: Build a Power Automate flow'

23 Module 5: Build a Power Automate flow

23.1 Lab 5.8: Practice Lab – Build a branching business process flow

23.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

23.2 Scenario

You have created several automations to support your client's knowledge assessments process and now it is time to bring the final pieces together. In this lab, you will update the business process flow and add a business rule.

Important Note: This lab will provide you with an actual Office 365 tenant and licenses for the Power Platform applications you will be using in this course. You will only be provided with one tenant for the practice labs in this course. The settings and actions you take within this tenant do not roll-back or reset, whereas the virtual machine you are provided with does reset each time you close the lab session. Please be aware that Office 365

is evolving all the time. The instructions in this document may be different from what you experience in your actual Office 365 tenant. It is also possible to experience a delay of several minutes before the virtual machine has network connectivity to begin the labs.

23.3 Exercise 1 – Update Process

23.3.1 Task 1 – Update Business Process Flow

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions**.
4. Click to open the **Common Data Services Default Solution**.
5. Click on the **...** button located on the command bar and select **Switch to Classic**.
6. Select **Processes** and click **Add Existing.** Select **Assessment Process** and click OK.
7. Select OK again to add components.
8. Select the **Assessment Process** BPF.
9. Select the **Components** tab, drag **Condition** and drop it in between the two existing stages.
10. Select the **Condition**, select the **Properties** tab, and enter **Check Notification** for **Display Name**.
11. Go to **Rule 1,** select **Notify Manager** for **Field**, select **Value** for **Type**, select **Yes** for **Value**, and click **Apply**.
12. Select the **Condition**, click **Connector** and select **Disconnect**.
13. Click **Update**.
14. Close the process editor. Click **Publish all Customizations.**
15. Close the solution explorer.

23.3.2 Task 2 – Add Business Lock Unlock Rule

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Solutions** and open the **Common Data Services Default Solution.**
4. Click to open the **Knowledge Assessment** entity.
5. Select the **Business Rules** tab and click **Add Business Rule**.
6. Click on the **Show Details** carrot button next to the Business Rule name.
7. Enter **Lock/Unlock Status** and click the carrot again to **hide details**.
8. Select the **Condition**, go to the **Properties** tab, and enter **Check Notification** for **Display Name**.
9. Go to **Rule 1**, select **Notify Manager** for **Field**, select **Equals** for **Operator**, select **Value** for **Type**, select **Yes** for **Value**, and click **Apply**.
10. Add new **Rule** by clicking **+ New**.
11. Go to **Rule 2**, select **Approval Status** for **Field**, select **Does not Equal** for **Operator**, select **Value** for **Type**, and select **Approved** for **Value**.
12. Make sure **And** is select for **Rule Logic** and click **Apply**.
13. Select the **Components** tab, drag **Lock/Unlock** action and drop it on the **True** side of the condition (the checkmark side).
14. Select the **Lock/Unlock** action, go to the **Properties** tab, enter **Lock Status** for **Display Name**, select **Status** for **Field**, select **Lock** for **Status**, and click **Apply**.
15. Select the **Components** tab, drag **Lock/Unlock** action and drop it on the **False** side of the condition (the x side).

16. Select the second **Lock/Unlock** action, got to the **Properties** tab, enter **Unlock Status** for **Display Name**, select **Status** for **Field**, select **Unlock** for **Status**, and click **Apply**.
17. Click **Save**.
18. Click **Activate**.
19. Confirm activation.
20. Close the process editor.
21. Click **Done**.
22. Click the **Common Data Services Default Solution** from the navigation breadcrumbs. Click **Publish all Customizations.**

23.3.3 Task 3 – Test the Updated Business process Flow

1. Navigate to https://make.powerapps.com.
2. Make sure you are in the **Practice** environment.
3. Select **Apps** and click to open the **Knowledge Admin** application.
4. Select **Assessments**.
5. Click **New**.
6. Enter **BPF Assessment Two** for **Title** and click **Save**.
7. Select the **Questions** tab and click **New Knowledge Question.**
8. Select **Simple** for **Question Type**.
9. Enter **Process Test Question** for **Question**.
10. Enter **Answer One** for **Answer 1**, **100** for **Answer 1 Points**.
11. Enter **Answer Two** for **Answer 2**, **0** for **Answer 2 Points**.
12. Enter **Answer Three** for **Answer 3**, **0** for **Answer 3 Points**.
13. Enter **Answer Four** for **Answer 4**, **65** for **Answer 4 Points**.
14. Click **Save**.
15. Click on the browser back button.
16. Your Business Process Flow should have just one stage.
17. Click on the **Knowledge Assessment** stage of then Business Process Flow. The steps for this stage will come to view.
18. Enter **80** for **Passing Score**.
19. Click on the **Total Points** calculator icon.
20. Click **Recalculate**.
21. The **Total Points** should get recalculated.
22. Select **Yes** for **Notify Manager**.
23. The Activate Stage should now be added to the Business Process Flow.
24. Select **Completed** for **Create Questions** and click **Next Stage**.
25. The process should move to the **Activate** stage.
26. The Business Rule should run and **Lock** the **Assessment Status**. Do not close this page.
27. Start a new browser window and navigate to https://flow.microsoft.com.
28. Select **Action items** and then select **Approvals**.
29. You should have one approval waiting for you. Click on the approval.
30. The Approval pane will open. Click **Approve**.

31. Provide **Comments** and click **Confirm**.
32. Go back to **Knowledge Admin** application and click on the **Refresh** button.
33. Click on the **Activate** stage of the Business Process Flow.
34. The Approval Flow should complete the approval and set the **Status** to **Approved**.
35. The Business Rule should **Unlock** the **Status** field.
36. Click **Finish**.

23.4 lab: title: 'Lab 6.1: Build a chatbot' module: 'Module 6: Work with Power Virtual Agents'

24 Module 6: Work with Power Virtual Agents

24.1 Lab 6.1: Practice Lab – Build a chatbot

24.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

24.2 Scenario

Students will be creating a bot for a company that provides inflatable equipment for events such as birthday parties and corporate events. While most customer inquiries such as placing and cancelling orders must be done by agents, the company would like to use a bot to handle much of the routing.

24.3 Exercise 1 – Getting started

In this exercise, you will acquire a PVA trial and create a bot.

24.3.1 Task 1 – Sign up for a PVA trial

1. Navigate to https://powerva.microsoft.com/. Select your country/region and click **Start free trial**.
2. Enter **Customer service bot** for **Name**, select your **Language**, select your **Practice** environment, and click **Create**.
3. Wait for the bot to be created. It might take a few minutes to complete.
4. Click **Explore Bot**, if prompted.

24.4 Exercise 2 – Create custom entities to capture information

24.4.1 Task 1: Create support categories entity

1. Select **Entities**.
2. Click **+ New custom entity.**
3. Enter **Support categories** for **Name**.
4. Enter **Order question** as an item and click **Add**.
5. Enter **Delivery & setup** as an item and click **Add**.
6. Enter **Weather related** as an item and click **Add**.

7. The **Support categories** custom entity should now have three items. Make sure **Smart matching** is turned on via the toggle and click **Save**.
8. Click **Close**.

24.4.2 Task 2: Create order entity

1. Make sure you still have **Entities** selected and click **+ New custom entity**.
2. Enter **Order** for **Name**.
3. Enter **Place order** as an item and click **Add**.
4. Enter **Cancel order** as an item and click **Add**.
5. The **Order** custom entity should now have two items. Make sure **Smart matching** is turned on via the toggle and click **Save**.
6. Click **Close**.

24.5 Exercise 3 – Design a Conversation path with Topics

24.5.1 Task 1: Create a Cancel Order Topic

1. Select **Topics** and click **+ New topic**.
2. Enter **Cancel order** for Name, enter **Cancel order** as a trigger phrase and click **Add**.
3. Enter **Cancel** as a trigger phrase and click **Add**.
4. The **Cancel order** topic should now have two trigger phrases. Click **Go to authoring canvas**.
5. Enter **Orders must be cancelled at least 48 hours before your scheduled event. Your deposit will not be refunded.** for **Message** and click the **plus (add node)** button. Note: when you copy and paste from the lab, you may see some styling in the canvas. Feel free to keep the styling or change it to your preferences.
6. Select **Show a message**.
7. Enter **Only live agents can process a cancellation request.** for **Message** and click the **plus (add node)** sign again.
8. Select **Ask a question**.
9. Enter **Would you like to talk to one now?** for question, enter **Yes** as an option, and click **+ New option**.
10. Enter **No** as the second option. You should now have two conditions.
11. Go to the **Yes** branch and click the **add node** button.
12. Hover over the **End the conversation** option and select **Transfer to agent**.
13. Enter **Customer would like to cancel order.** for **Private message to agent**.
14. Go to the **No** branch and click **Add node**.
15. Select **Show a message**.
16. Enter **Can I help you with anything else?** for **Message**.
17. Click **Save**.

24.5.2 Task 2: Create a New order topic

1. Select **Topics** and click **+ New topic**.
2. Enter **New order** for **Name**, enter **New order** as a trigger phrase and click **Add**.
3. Enter **Place an order** as a trigger phrase and click **Add**.
4. Enter **Make a new order** as a trigger phrase and click **Add**.
5. The New order topic should now have three trigger phrases. Click **Go to authoring canvas**.

6. Enter **Be advised that all new orders require a non-refundable $100.00 deposit that will be applied to your total order cost.** for **Message** and click **add node**.
7. Select **Show a message**.
8. Enter **Let me transfer you to an agent to process your request.** for Message and click **add node.**
9. Hover over the **End the conversation** option and select **Transfer to agent**.
10. Enter **Customer would like to place an order.** for **Private message to agent**.
11. The New order topic should now have three nodes. Click **Save**.

24.5.3 Task 3: Create a check weather topic

1. Select **Topics** and click + **New topic**.
2. Enter **Check weather** for **Name**, enter **Weather** as a trigger phrase and click **Add**.
3. Enter **Today's weather** as a trigger phrase and click **Add**.
4. Enter **What is the weather like** as a trigger phrase and click **Add**.
5. Enter **Will it rain today** as a trigger phrase and click **Add**.
6. Enter **Check weather** as a trigger phrase and click **Add**.
7. The Check weather topic should now have five trigger phrases. Click **Go to authoring canvas**.
8. Enter **I can help you with that. I just need some additional information.** for **Message** and click **add node**.
9. Select **Ask a question**.
10. Enter **What city do you live in?** click **Identify** and select **User's entire response**.
11. Click the pencil under **Save response as** to edit the variable.
12. Enter **City** for **Name** and close the **Variable properties** pane.
13. Click **Add node**.
14. Select **Ask a question**.
15. Enter **What is your postal code?** Click **Identify** and select **User's entire response**.
16. Click the **pencil** icon again to edit the variable.
17. Enter **ZipCode** for **Name** and close the **Variable properties** pane.
18. Click **add node**.
19. Select **Call an action** and select **Create a flow**.
20. Power Automate should open in a new browser window or tab.
21. Select your **country/region** and click **Get started**, if prompted.
22. Click + **Add an input** and select **Text.**
23. Select the first box and enter **City.**
24. In the second box, enter **Provide city** and click + **Add an input** again. Select **Text.**
25. Enter **Zip code** in the first text box and enter **Provide zip code** in the second text box.
26. Hover over between the flow trigger and the step, and then click on the + button. You are adding a step between the trigger and the return values step.
27. Select **Add an action**.
28. Search for msn and select **Get forecast for today**.
29. Click on the Location field, go to the Dynamic content pane, and select **City**.
30. Add comma after the city and then select **Zip code** form the Dynamic content pane.
31. Select your preferred units. For this lab, we are selecting **Imperial**.

32. Click to expand the **Return value(s) to Power Virtual Agents** step.
33. Click **+ Add an output**.
34. Select **Text**.
35. Enter **Day_Summary** in the first box. In the second box, select **Day Summary** from the Dynamic content pane.
36. Click **Add an output**.
37. Select **Text**.
38. Enter **Location** in the first box. In the second text box, select **Location** from the Dynamic content pane.
39. Click **Add an output** again.
40. Select **Text**.
41. Enter **Chance_of_rain** in the first box. Click on the second text box and select **Rain Chance** from the Dynamic content pane.
42. Rename the flow to **Check weather** by selecting the current name in the upper left corner of the editor. Click **Save**.
43. Wait for the flow to be saved.
44. Go back to your **Power Virtual Agents** tab.
45. Click **Add node**.
46. Select **Call an action** and then select the **Check weather** flow you created.
47. Click on the **City** dropdown and select **City**.
48. Click on the **Zip code** dropdown and select **ZipCode**.
49. Click **Add node**.
50. Select **Show a message**.
51. Click the **{x}** button to insert a variable.
52. Select **Day_Summary**.
53. Type a space. Then type **There is a**, another space, and then insert the **Chance_of_Rain** variable.
54. Type another space, type **percent chance of rain in**, enter another space, and then insert the **Location** variable. Add a period after the location variable to end your sentence.
55. Click **Save** to save the topic.

24.5.4 Task 4: Create a delivery and set-up topic

1. Select **Topics** and click **+ New topic**.
2. Enter **Delivery and setup** for **Name**.
3. Enter **Delivery** as a trigger phrase and click **Add**.
4. Enter **When will my order be delivered** as a trigger phrase and click **Add**.
5. Enter **Who will set up the items** as a trigger phrase and click **Add**.
6. Enter **Who will remove the items** as a trigger phrase and click **Add**.
7. Enter **Schedule a setup** as a trigger phrase and click **Add**.
8. Enter **Schedule delivery** as a trigger phrase and click **Add**.
9. Enter **Schedule removal** as a trigger phrase and click **Add**.
10. The Delivery and setup topic should now have seven trigger phrases. Click **Go to authoring canvas**.
11. Enter **Items are delivered one hour before your scheduled event.** for **Message** and click **Add node**.
12. Select **Show a message**.

13. Enter **2 delivery people will come and set up your items** for **Message** and click **Add node.**
14. Select **Show a message**.
15. Enter **What else can I assist with?** for **Message**.
16. Click **Save** to save the topic.

24.5.5 Task 5: Add an order topic

1. Select **Topics** and click **+ New topic**.
2. Enter **Order** for **Name**.
3. Enter **Order question** for trigger phrase and click **Add**.
4. Click **Go to authoring canvas**.
5. Enter **I can help you with that.** for Message and click **add node.**
6. Select **Ask a question**.
7. Enter **What do you want to do?** in the question box. Enter **Place an order** for the first option and click **+ New option.**
8. Enter **Cancel order** for the second option.
9. You should now have two condition branches. Go to the **Place an order** branch and click **Add node**.
10. Select **Go to another topic**.
11. Select the **New order** topic you created.
12. Go to the **Cancel order** branch and click **Add node**.
13. Select **Go to another topic** again.
14. Select the **Cancel order** topic you created.
15. Click **Save** to save the topic.

24.5.6 Task 6: Modify greeting system topic

1. Select **Topics**.
2. Search for **greeting**, hover over the **Greeting** topic and click **Go to authoring canvas**.
3. Replace the first message with **Hi! I am a virtual agent here to help with questions ranging from ordering questions to weather-related questions.**
4. Replace the second message with **If you would like to speak to a human at any time, just let me know.**
5. Click on the **... Options** button of the last message and click **Delete**.
6. Click **Add node**.
7. Select **Ask a question**.
8. Enter **What can I help you with?** for question.
9. Enter **Order questions** for first option and click **+ New option**.
10. Enter **Delivery and setup** and click **+ New option** again.
11. Enter **Weather-related** for the third option.
12. You should have three condition branches. Go to the **Order questions** branch and click **Add node**.
13. Select **Go to another topic**.
14. Select the **Order** topic you created.
15. Go to the **Delivery and setup** branch and click **Add node**.
16. Select **Go to another topic**.
17. Select the **Delivery and setup** topic you created.

18. Go to the **Weather-related** branch and click **Add node**.
19. Select **Go to another topic**.
20. Select the **Check weather** topic you created.
21. Click **Save** to save the topic.

24.6 Exercise 4 – Test and publish your bot

24.6.1 Task 1: Test your bot

1. Click on the **Test your bot** button located in the bottom-left corner of the screen if it is not already expanded.
2. Turn on **Track between topics**.
3. Type **Hello** and click **Send** or [**ENTER**].
4. The bot should greet you and give you options. Keep a watch on the current topic.
5. Select **Delivery and setup** from the options.
6. The topic should change to the **Delivery and setup** topic and the bot should reply with the delivery and setup messages.
7. Enter **Order question** and **Send**.
8. The topic should change to the **Order** topic and the bot should give you options to place an order or cancel an order.
9. Choose **Cancel order**.
10. The bot should display the order cancelation messages. Type **Will it rain today** and **Send**.
11. The topic should change to the **Check weather** topic and the bot should ask you to provide your city.
12. Enter city name and **Send**.
13. Provide your zip code and **Send**.
14. The bot should trigger the flow and reply with the result of MSN weather connector.
15. Type **Goodbye** and **Send**.
16. Click **Hide bot**.

24.6.2 Task 2: Publish your bot

1. Select **Publish** from the left menu and click Publish.
2. Click **Publish** again to confirm and wait for the publishing to complete.
3. Click on the **demo website link**.
4. Interact with bot on the demo website and see how it performs.
5. You may share the demo website with others.

24.7 lab: title: 'Lab 7.1: Bulk delete' module: 'Module 7: Analyze data with Power BI'

25 Module 7: Analyze data with Power BI

25.1 Lab 7.1: Practice Lab – Bulk delete

25.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

25.2 Scenario

You are a functional consultant working on the Fabrikam project. Your client wants you implement some automatic data cleanup of stale data. You have been asked to delete any Knowledge Assessment that is over 6 months past its end date. You will be using the Bulk Delete feature of the Common Data Service.

25.3 Exercise 1 – Bulk Delete

In this exercise, you will create a bulk deletion operation that will delete all Knowledge Assessment records with an End Date older than 6 months, this operation will run every 7 days.

25.3.1 Task 1 – Create Bulk Delete Operation

In this task, you will create a bulk deletion operation.

1. Navigate to https://admin.powerplatform.microsoft.com.
2. Select your **Practice** environment.
3. Click **Settings**.
4. Go to the **Data Management** section and click **Bulk Deletion**.
5. Click **New**.
6. Click **Next**.
7. Select **Knowledge Assessments** from the **Look for** dropdown.
8. Click **Select** and choose the **End date** field.
9. Select **Older than X Months**.
10. Enter **6** and click **Next**.
11. Change the **Name** to **Delete Old Assessments**.
12. Select to run **At Scheduled Time.**
13. Select today's date for **Date** and select **10 Minutes** in to the future for **Time**.
14. Check the **Run this Job After Every** checkbox.
15. Select **7 Days**.
16. Check the **Send an Email...** checkbox and click **Next**.
17. Click **Submit**.
18. Wait for the job to be created. This can take few minutes. Refresh the view as needed.

25.3.2 Task 2 – Test Bulk Deletion

In this task, you will test the bulk delete operation you created.

1. Navigate to https://make.powerapps.com/ and make sure you are in your **Practice** environment.
2. Select **Apps**.
3. Locate and click to open the **Knowledge Admin** application.
4. Select **Knowledge Assessments.**
5. Click to open one of the **Knowledge Assessment** records.
6. Change the **End Date** to **Seven Months** in the past.
7. Click **Save**.

8. Wait for the bulk delete job to complete at the designated time. The record will be deleted.

25.4 lab: title: 'Lab 7.2: Build a Word template' module: 'Module 7: Analyze data with Power BI'

26 Module 7: Analyze data with Power BI

26.1 Lab 7.2: Practice Lab – Build a Word template

26.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

26.2 Scenario

You are a functional consultant for Contoso building a knowledge assessment application for you client Fabrikam. You need to configure a template so that managers can easily generate a certificate of completion to give users after achieving a passing score. In this lab, you will create a certificate of completion through a Word template and update that Word template to the app.

Note: This lab assumes you are using the latest version of Microsoft Word. If you are working with an older version, your user experience may not exactly match the instructions as written.

26.3 Exercise 1 – Word Template

In this exercise, you create a Microsoft Word template for the Test Result entity. This document will generate a certificate of completion.

26.3.1 Task 1 – Create Knowledge Test Result

In this task, you will create a Knowledge Test Result record.

1. Navigate to https://make.powerapps.com.
2. Make sure you are in your **Practice** environment.
3. Select **Apps**.
4. Locate and click on the **Knowledge Admin** model-driven application.
5. Select **Knowledge Test Results**.
6. Click **New**.
7. Enter **Result for Template** for Primary Name.
8. Click on the **Knowledge Assessment** lookup field and select any record.
9. Enter **960** for **Total Points** and click **Save**. DO NOT navigate away from this page.

26.3.2 Task 2 – Create Template

In this task, you will create the template. You will do this by downloading the starting template for the entity. You will also enable to Developer menu in Microsoft Word.

1. Click on the **Word Template** button located on the command bar and select **Download Template**.
2. Make sure **Knowledge Test Result** is selected for Entity.
3. Go to the N:1 Relationship dropdown and click on chevron button.

4. You will now select 2 entities:
    - **Knowledge Assessment**
    - **User (user_crxxx_knowledgetestresult)** (where xxx will be your unique prefix)
5. Click **Download**.
6. Wait for the template to be downloaded and click then click **Open**.
7. Click **Enable Editing**.
8. Click **File** and select **Options**.
9. Select **Customize Ribbon**.
10. In the **Main Tabs** section locate and check the **Developer** checkbox.
11. Click **OK**.
12. Select the **Developer** tab and click XML Mapping Pane.
13. Click on the **Custom XML Parts** dropdown and select the **URL** with the Word **Template** and the entity name in it.
14. You are now ready to build the template.

26.3.3 Task 3 – Build Template

In this task, you will build a basic certificate and insert data from CDS.

1. Select the **Layout** tab, click **Orientation** and select **Landscape**.
2. Click **Margins** and select **Normal 1" 1" 1" 1".**
3. Select the **Insert** tab, click **Text Box** and select **Simple Text Box**.
4. Select the **Format** tab, click **Shape Fill** and select **No Fill**.
5. Click **Shape Outline** and select **No Outline**.
6. Select the **Home** tab and select **Align Center.**
7. Replace the placeholder text with **Certificate of Completion**.
8. Select the text and select **Old English Text MT** for **Font**.
9. Change the **Font Size** to **72**
10. Resize the **Textbox** to fill the page horizontally.
11. Select the **Shape Format** tab, click **Text Effect**, click **Transform**, and select the first option in **Follow Path** showing an arch.
12. Select the **Insert** tab, click **Text Box** and select **Simple Text Box**.
13. Select the **Format** tab, click **Shape Fill** and select **No Fill**.
14. Click **Shape Outline** and select **No Outline**.
15. Select the **Home** tab and select **Align Center.**
16. Replace the with **This certificate was presented to:**
17. Select the text and change the **Font Size** to **18**.
18. Place your cursor at the end of the text and press the **enter** key.
19. Go to the **XML Mapping** pane and expand the entity.
20. Expand the **User** entity.
21. Locate the **fullname** field and right click on it.
22. Click **Insert Content Control** and select **Plain Text**.
23. Select the text of the control and change the **Font** to **Castellar**.
24. Change the **Font Size** to **24**.

25. Insert another **Simple Text Box** and place it below the **Full Name**.
26. Set the **Fill** of the new textbox to **No Fill**.
27. Set the **Outline** of the new textbox to **No Outline**.
28. Set the alignment of the new textbox **Align Center**.
29. Replace the text of the new textbox with **For completing the**
30. Go to the **XML Mapping** pane and expand the **Knowledge Assessment** entity.
31. Right click on the **Title** field, click **Insert Content Control**, and select **Plain Text.**
32. Place your cursor in front of the **Title** control and type **with** .
33. Make sure your text box is selected. Go to the **XML Mapping** pane and go to the **Knowledge Test Result** entity.
34. Right click on the **Total Points** field, click **Insert Content Control**, and select **Plain Text.**
35. Place your cursor in front of the **Total Points** control and type **total points** .
36. Press the **enter** key.
37. Type **Completion Date:** and press the **enter** key.
38. Go to the **XML Mapping** pane and go to the **Knowledge Test Result** entity.
39. Right click on the **Created-On** field, click **Insert Content Control**, and select **Plain Text.**
40. Select the **Insert** tab and click **Icons.** Search **Badge** in the search bar and select your favorite badge image.
41. Place the image below the **CreatedOn** control and center it.
42. Click **File** and click **Save**.
43. Enter **Assessment Certificate** for name and click **Save as**. Remember where you are saving your template.

26.4 Exercise 2 – Uploading and Using Word Template

In this exercise, you will upload the template you created and test it.

26.4.1 Task 1 – Upload Template

In this task, you will upload the template you created.

1. Go to your **Knowledge Admin** Model-Driven application.
2. Select **Knowledge Test Results**.
3. Open the **Knowledge Test Result** record you created.
4. Click on the **Word Template** button located on the command bar and select **Upload Template**.
5. Click **Choose File.**
6. Select the template you created and click **Open**.
7. Click **Upload**.

26.4.2 Task 2 – Use Word Template

In this task, you will test the template you created.

1. Click on the **Word Template** button located on the command bar and select the **Assessment Certificate** template you uploaded.
2. Click Open.
3. Your certificate will open.

26.5 lab: title: 'Lab 7.3: Build an Excel template' module: 'Module 7: Analyze data with Power BI'

27 Module 7: Analyze data with Power BI

27.0.1 Lab 7.3: Practice Lab – Build an Excel template

27.0.2 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

27.1 Scenario

You are a functional consultant for Contoso building a knowledge assessment application for you client Fabrikam. You need to configure a template so that managers without much experience in Excel or the knowledge assessment application can generate an Excel report of test scores. In this lab, you will create an Excel template from a view, upload the template and use it against data about knowledge test results.

Note: This lab assumes you are using the latest version of Microsoft Excel. If you are working with an older version, your user experience may not exactly match the instructions as written.

27.2 Exercise 1 – Build an Excel template

In this exercise, you will build an Excel template for the Knowledge Test Result entity.

27.2.1 Task 1 – Create View

In this task, you will create a new view for the Knowledge Test Result entity.

1. Navigate to https://make.powerapps.com. Ensure you are in your Practice environment.
2. Expand **Solutions** on the left navigation.
3. Click to open the **Common Data Services Default Solution.**
4. Locate and click to open the **Knowledge Test Result** entity.
5. Select the **Views** tab and click **Add View**.
6. Enter **Excel Template View** for Name and click **Create**.
7. Change the **Fields** pane to show **All** fields using the dropdown next to the Search box.
8. Select the fields listed below:
    - Knowledge Assessment
    - Total Points
    - Created On
    - Owner
9. Click **Save**.
10. Click **Publish**.
11. Close the view editor window.

27.2.2 Task 2 – Create the Excel Template

In this task, you will be creating an Excel worksheet with a Pivot Chart on Knowledge Test Results.

1. Navigate to make.powerapps.com and ensure you are in your **Practice** environment. Select **Apps**.
2. Locate and click on the **Knowledge Admin** model-driven application.

3. Select **Knowledge Test Results**.
4. Click on the **Excel Template** button located on the command bar and select **Download Template**.
5. Make sure **Knowledge Test Result** is selected for **Entity** and select **Excel Template View** for **View**.
6. Click **Download**.
7. Wait for the template to be downloaded and then click **Open**.
8. Click **Enable Editing**.
9. Select the **Insert** tab and click **Pivot Table**.
10. The data should be selected. Click **OK** in the pop-up window.
11. Click **Pivot Chart** in the command bar.
12. Select **Column** and click **OK**.
13. Go to the **PivotChart Fields** pane and select **Total Points** and **Owner**.
14. Right click on the Pivot table and select **Pivot Table Options**.
15. Select the **Data** tab.
16. Check the **Refresh data when opening the file** checkbox and click **OK**.
17. Click **File** and click **Save As**.
18. Save the file on your machine and name it **Knowledge Test Result Template**.
19. Close the Excel file.

27.3 Exercise 2 – Upload and Use Excel Template

In this exercise, you will upload the template you created and test it.

27.3.1 Task 1 – Upload Template

In this task, you will upload the template you created

1. Go to your **Knowledge Admin** Model-Driven application.
2. Select **Knowledge Test Results**.
3. Click on the **Excel Template** button located on the command bar and select **Upload Template**.
4. Click **Choose File**.
5. Select the template you created and click **Open**. (**Note:** Depending on the way your file was saved, you may need to expand the browse function to **all file types** to see your template.)
6. Click **Upload**.

27.3.2 Task 2 – Use Excel Template

In this task, you will create a new Knowledge Test Result record and test the template you created.

1. Click **+ New**.
2. Enter **New Test Result** for **Name**, select one of the available Knowledge Assessments **Knowledge Assessment**, enter **980** for **Total Points** and click **Save and Close**.
3. Click on the **Excel Template** button located on the command bar and select the **Knowledge Test Result Template** you uploaded.
4. Click **Download Knowledge Test Result Template.**
5. Wait for the download to complete and click **Open**.
6. Select **Sheet1** and make sure the new record is in the table.

27.4 lab: title: 'Lab 7.4: Duplicate detection' module: 'Module 7: Analyze data with Power BI'

28 Module 7: Analyze data with Power BI

28.1 Lab 7.4: Practice Lab – Duplicate detection

28.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

28.2 Scenario

You are a functional consultant working on the Fabrikam project. Your client wants to make users aware of potential duplicates when creating contacts and you have been tasked with implementing duplicate detection. In this practice, you will create and modify duplicate detection rules.

28.3 Exercise 1 – Edit Existing Duplicate Detection Rules

In this exercise, you will customize an existing rule named Contacts with the same business phone number to refine its criteria. You will also deactivate the Accounts with the same website rule because Fabrikam found that too often they created accounts for different locations that had the same website.

28.3.1 Task 1 – Customize Duplicate Detection Rule

It is very common for multiple Contacts that have the same business phone number, but the Contact with same business phone number duplicate detection rule tags these Contacts as duplicates.

In this task, you will enhance the Contact with the same business phone number rule by adding criteria to match of last name.

1. Navigate to https://admin.powerplatform.microsoft.com.
2. Select **Environments**.
3. Select your **Practice** environment.
4. Navigate to **Settings > Data Management.**
5. Click **Duplicate Detection Rules**.
6. Locate and click to open the **Contacts with the Same Business Phone Number**. It will open in a new window.
7. In the new window, click **Unpublish**.
8. Click **OK**.
9. Locate the **Duplicate Detection Rule Criteria** section and click **Select**.
10. Locate and select **Last Name**.
11. Select **Exact Match** for **Criteria**.
12. Change the name to **Contacts with the same business phone number and last name**.
13. Change the Description to **Detects contact records that have the same value in the Business Phone field and the last name field**.
14. Click **Save**.
15. Click **Publish**.

16. Click **OK**.
17. Click **Close**. DO NOT navigate away from this page.

28.3.2 Task 2 – Unpublish Duplicate Detection Rule

It is very common for different locations of the same account to have the same website. Therefore, the Accounts with the same website rule is not useful because it will detect these accounts as duplicates.

In this task, you unpublish the Accounts with the same website rule.

1. Locate and click to open the **Accounts with the same website** rule.
2. Click **Unpublish**.
3. Click **OK**.
4. Click **Save and Close**. DO NOT navigate away from this page.

28.4 Exercise 3 – Create New Duplicate Detection Rules

In this exercise, you will create a new duplicate detection rule that will mark a Contact as duplicate if it has the same last name, the same first 3 letters of the first name, and the same last 10 letters of the email.

28.4.1 Task 1 – Create Duplicate Detection Rule

1. While still on the Duplicate Detection Rules, click **New**.
2. Enter **Contacts with the same last name, similar first name, and similar email** for **Name**.
3. Select **Contact** for **Base Record Type** and **Contact** for the **Matching Record Type**.
4. Click **Select**.
5. Locate and select the **Last Name** field.
6. Select **Exact Match** for **Criteria**.
7. Click **Select** again.
8. Locate and select the **First Name** field.
9. Select **Same First Characters** for **Criteria** and enter **3** for **No. of Characters**.
10. Click **Select** one more time.
11. Locate and select the **Email** field.
12. Select **Same Last Characters** for **Criteria** and enter **10** for **No. of Characters**.
13. Click **Save**.
14. Click **Publish**.
15. Click **OK**.
16. Click **Close**.

28.5 lab: title: 'Lab 7.5: Import data' module: 'Module 7: Analyze data using Power BI'

29 Module 7: Analyze data using Power BI

29.1 Lab 7.5: Practice Lab – Import data

29.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

29.2 Scenario

You are a functional consultant working on the Fabrikam project. Your client wants you to import some data in the their CDS environment. Specifically, they have some data to import into an existing Knowledge Assessment entity. You choose to leverage Power Query to transform the data and complete the import.

29.3 Exercise 1 – Import Data

In this exercise, you will import Knowledge Assessment records into your CDS environment.

Important: Before starting this lab, download the **Knowledge Assessment Import File** from the Allfiles folder (or provided directly by your instructor) and save it to your local desktop.

29.3.1 Task 1 – Load Excel file to OneDrive

In this task, you will Load then Knowledge Assessments Excel file to your OneDrive. You can choose many data sources to use with Power Query, but Excel was the one you chose.

1. Navigate to https://make.powerapps.com/ and make sure you are in your **Practice** environment.
2. Click on the **Waffle** button in the upper left corner to change applications and select **OneDrive**. (It may take a moment for your OneDrive to be set up. Click **Your OneDrive is ready** when you see it on the screen.)
3. Click **Upload** from the top menu and select **Files**. (Depending on how your Excel file saved, you may need to change your browse function to search for all file types.)
4. Select the **Knowledge Assessment Import File** file located in the resources folder and click **Open**.

29.3.2 Task 2 – Create Data Integration Project

In this task, you will create a new data integration project and transform the table

1. Navigate to https://make.powerapps.com/ and make sure you are in your **Practice** environment.
2. Expand **Data** and select **Entities.**
3. Click **Get data.**
4. Select **Excel**.
5. Click **Browse OneDrive**.
6. Pick your account.
7. Select the **Knowledge Assessment Import File** file you uploaded to OneDrive and click **Open**.
8. Click **Next**.
9. Check the box next to **Table1.** Click **Transform data**. Do not navigate away from this page.

29.3.3 Task 3 – Manage and Transform Columns

In this task, you will remove unwanted columns, split the End Date column, change the year from 2019 to 2020, and then merge back together.

3. Select the **End Date** column.
4. Right click, select click **Split Column**, and select **By Delimiter**.
5. Select **Advanced**.
6. Select **Custom** for **Separator**.
7. Type / in the box.

8. Enter **3** for **Number of Columns.**
9. Click **OK**.
10. Select the **End Date.3** column.
11. Right click on the header and select **Replace Values**.
12. Enter **2021** for **Value to Find**.
13. Enter **2022** for **Replace with** and click **OK**.
14. Select all three **End Date** columns. Select **End Date.1 first**, then **End Date.2**, and then **End Date.3**.
15. Right click on the header and select **Merge Columns**.
16. Select **Custom** for **Separator**.
17. Enter / and click **OK**.
18. Double click on the **Merged** column and rename it **End Date**.
19. Click **Next**.
20. Select **Load to Existing Table.**
21. Select **crXXX_Knowledge Assessment**, where crXXX is your unique prefix.
22. Map **Difficulty** to **crXXX_Difficulty**.
23. Map **End Date**, **Start Date**, and **Title** to their corresponding fields.
24. Click **Next.**
25. click **Refresh manually** and then click **Create**.

29.3.4 Task 4 – Test Your Work

1. Select **Entities**.
2. Locate and click to open the **Knowledge Assessment** entity.
3. Select the **Data** tab.
4. You should see all the imported **Knowledge Assessments**.
5. Select **Apps** and click to open the **Knowledge Admin** application.
6. Select **Knowledge Assessments**.
7. The imported **Knowledge Assessments** should be on this view. (Refresh if needed.)
8. Click to open one of the **Knowledge Assessments** you imported.
9. Locate the **Days Remaining** field in the header and make sure it has a calculated value.

29.4 lab: title: 'Lab 7.6: Export data' module: 'Module 7: Analyze data with Power BI'

30 Module 7: Analyze data with Power BI

30.1 Lab 7.6: Practice Lab – Export data

30.1.1 Important Notice (Effective November 2020):

Common Data Service has been renamed to Microsoft Dataverse. Some terminology in Microsoft Dataverse has been updated. For example, entity is now table and field is now column.

While the application is in the process of updating its user experience, some references to terminology like the Common Data Service (now **Dataverse**), entity (now **table**), field (now **column**), and record (now **row**) may be out of date. Please keep this in mind as you work through the labs. We expect to have our content fully up to date very soon.

For more information and for a complete list of affected terms, please visit What is Microsoft Dataverse?

30.2 Scenario

You are a functional consultant working on the Fabrikam project. Your client wants to export some data form the CDS environment.

30.3 Exercise 1 – Export Data

In this exercise, you will export data from the maker portal.

30.3.1 Task 1 – Portal Export

In this task, you will export data from the maker portal.

1. Navigate to https://make.powerapps.com/ and make sure you are in the **Practice** environment you created.
2. Expand **Data** and select **Entities**.
3. Locate and click to open the **Knowledge Assessment** entity.
4. Click **Export Data**.
5. Wait for the data to be exported.
6. Click **Download Exported Data.**
7. Save the exported data on your local machine.
8. Open the folder the data was downloaded to.
9. Right click on the exported zip file and extract.
10. Open the exported **CSV** file.
11. You should see all the exported **Knowledge Assessment** records.
12. Close the **CSV** file.
13. You may delete the exported file.