**Analyzing demographics**

1.

Navigate to Databel - Aggregate sheet.

**Hint**

Double-click on a worksheet to access it.

2.

We'd like to get further insight into the demographic variables relating to age.

* Create a new column "Demographics" next to the Group column using a nested IF() formulas that categorizes customers into the following categories: "Under 30", "Senior" and "Other".

You can utilize the [**metadata sheet**](https://campus.datacamp.com/courses/case-study-analyzing-customer-churn-in-excel/investigating-churn-patterns-22d85108-3ea1-4e82-a064-31f8fe812fa0?ex=2) for additional information on variables.

**Hint**

Your formula should look something like this: =IF([@[Under 30]]="Yes", "Under 30", IF([@Senior]="Yes", "Senior", "Other")).

3.

Create a blank *PivotTable* of the Aggregate table and place it in a new *Worksheet*. Rename this worksheet "Churn Analysis".

**Hint**

* Select any cell in the Aggregate table and click *Insert* then *PivotTable*.
* Ensure that the *Table/Range* input is Aggregate.
* Check *New Worksheet* and click *OK*.
* To rename a worksheet, double-click on it and type in the updated name.

4.

In the *PivotTable*:

* Create a calculated field "Churn Rate %" that divides churned customers by total customers, then add it to the PivotTable.
* Format the calculated field as a % to two decimal places.

We'll be able to re-use this calculated field throughout our analysis.

**Hint**

* Click on the *PivotTable* to make sure the *PivotTable Analyze* ribbon bar is showing.
* Under the *PivotTable Analyze* ribbon click *Fields, Items & Sets*, then *Calculated Field*.
* Set the *Name* to "Churn Rate %".
* The Formula should be ='Churned Customers' /'Total Customers'
  + Double click on the field names to easily bring them into the formula rather than typing.

5.

Now let's break this out even further and analyze churn by Demographics.

**Hint**

Drag Demographics to the *Rows* section.

6.

**Which demographic group has the highest churn rate?**

* Other
* Senior
* Under 30

**Hint**

Your formulas should look like the below:

* Demographics: =IF([@[Under 30]]="Yes", "Under 30", IF([@Senior]="Yes", "Senior", "Other"))
* Churn Rate %: ='Churned Customers' /'Total Customers'

In your PivotTable, you should have:

* Rows: Demographics
* Values: Sum of Churned Rate %

*If you're still stuck, review the solution in 2\_2\_age\_groups.xlsx from the Workbooks folder.*

**Age groups**

1.

* Create a copy of the PivotTable from the previous exercise in the Churn Analysis sheet.
* Replace Demographics with Age in *Rows* and add Total Customers to *Values*.

**Hint**

* Highlight the entire PivotTable that currently displays Demograhics by Sum of Churn Rate %.
* Using CTRL+C and CTRL+V, copy and paste the pivot table into a new cell such as A10.
* To remove a field from a PivotTable, de-select it from the *PivotTable Fields* pane.

2.

Create **groups** for Age with a split of 10.

**Hint**

* To group rows in a *PivotTable*, right-click any value and navigate to *Group…*
* The grouping will automatically work out the start and end values, leave these and set a grouping size in the *By:* section.

3.

Create a line and clustered column chart that shows the number of customers and churn rate for every age bracket.

**Hint**

To create a *Line and clustered column chart*, click anywhere in the *PivotTable* and navigate to *Insert* > *Charts* menu and click on *Insert Combo Chart* button and select the *Clustered Column - Line on Secondary Axis* variant.

4.

Format your chart and make the graph visually appealing.

**Hint**

* To rename the chart, double-click on the title above the chart and type in a new name.
* To hide field buttons: right-click on the gray chart buttons and select *Hide all Field Buttons on Chart*.
* To delete a legend: right-click on the *Legend* and select *Delete*.

5.

**Which age group makes up the lowest number of customers but the highest churn rate?**

**79-88**

In your PivotTable, you should have:

* Rows: Age
* Values: Customers, Churn

*If you're still stuck, review the solution in 2\_3\_unlimited\_plan.xlsx from the Workbooks folder.*

**Unlimited plan**

1.

Create a PivotTable in Churn Analysis based on the Aggregate table that analyses the total number of customers who have an unlimited data plan, as well as the churn rate.

**Hint**

* Select any cell in the Aggregate table and click *Insert* then *PivotTable*.
* Ensure that the *Table/Range* input is Aggregate.
* Check *Existing Worksheet* then navigate to Churn Analysis and select a cell and click *OK*.

2.

It appears that customers who are on an unlimited plan are more likely to churn. To see if it is related to a certain amount of mobile data (GB) being used, create a new column in Databel - Aggregate called Grouped Consumption that classifies the average monthly GB download in the following groups:

* Less than 5 GB.
* Between 5 and 10 GB.
* 10 or more GB.
* **Hint**
* Your formula should look something like this: =IF([@[Avg Monthly GB Download]]<5, "\_\_\_\_", IF([@[Avg Monthly GB Download]]<10, "\_\_\_\_", "\_\_\_\_")).

3.

Refresh your PivotTable and re-arrange your table to analyze churn rate by Unlimited Data Plan and Grouped Consumption.

Hint

* To refresh a *PivotTable*, right-click and select *Refresh*. Your new field should appear in the *PivotTable Fields* pane.
* Drag Unlimited Data Plan from *Rows* to *Columns* and place Grouped Consumption in *Rows*.

4.

* Create a stacked bar or column chart to visualize Churn Rate by Unlimited Data Plan and broken out by average consumption levels.
* Format your chart and make the graph visually appealing.

**Hint**

* To create a *Stacked column chart*, click anywhere in the *PivotTable* and navigate to *Insert* > *Charts* menu and click on *Insert Column or Bar Chart* button and select the *Stacked Column* variant.
* To rename the chart, double-click on the title above the chart and type in a new name.
* To hide field buttons: right-click on the gray chart buttons and select *Hide all Field Buttons on Chart*.
* To delete a legend: right-click on the *Legend* and select *Delete*.

5.

**What's the churn rate for people on an unlimited plan who consume less than 5 GB of data? (Answer format: XX.XX%)**

**34.69%**

Hint

Your formulas should look like the below: =IF([@[Avg Monthly GB Download]]<5, "Less than 5GB", IF([@[Avg Monthly GB Download]]<10, "Between 5 and 10GB", "10 or more GB"))

In your PivotTable, you should have:

* Columns: Unlimited Data Plan
* Rows: Grouped Consumption
* Values: Sum of Churned Rate %

*If you're still stuck, review the solution in 2\_4\_international\_calls.xlsx from the Workbooks folder****.***

**International calls**

1.

Create a PivotTable in Churn Analysis based on the Aggregate table that displays a matrix of churn rate by State and whether a customer is on an Intl Plan

**Hint**

* Select any cell in the Aggregate table and click *Insert* then *PivotTable*.
* Ensure that the *Table/Range* input is Aggregate.
* Check *Existing Worksheet* then navigate to Churn Analysis and select a cell and click *OK*.

2.

Remove grand-totals from the *PivotTable*.

**Hint**

1. Click on the *PivotTable* to make sure the *PivotTable Analyze* and *Design* ribbon bar is showing.
2. Under the *Design* ribbon click *Grand Totals*, then *Off for Rows and Columns*.

3.

Apply a Red - Yellow - Green colour scale on the churn rate values within the PivotTable.

**Hint**

* Highlight all cells that you need to apply conditional formatting on.
* Under *Home* click on *Conditional Formatting*, then *Color Scales* and select the appropriate scale to display high churn rates in **red** and low churn rates in **green**.

4.

**It seems there is a state that has customers on a international plan that has a particularly high percentage of churners. Write the name code of this state (e.g., MT).**

**CA.**

**Hint**

In your PivotTable, you should have:

* Columns: Intl Plan
* Rows: State
* Values: Sum of Churned Rate %

*If you're still stuck, review the solution in 2\_5.xlsx from the Workbooks folder.*

**Contract type**

1.

* Create a PivotTable in Churn Analysis based on the Aggregate table that displays churn rate based on the customers account length.
* Remove *Grand Totals* from the *PivotTable*.

**Hint**

* Select any cell in the Aggregate table and click *Insert* then *PivotTable*.
* Ensure that the *Table/Range* input is Aggregate.
* Check *Existing Worksheet* then navigate to Churn Analysis and select a cell and click *OK*.
* Click on the *PivotTable* to make sure the *PivotTable Analyze* and *Design* ribbon bar is showing.
* Under the *Design* ribbon click *Grand Totals*, then *Off for Rows and Columns*.

2.

Create **groups** for Account Length (in months) with a split of 12.

**Hint**

* To group rows in a *PivotTable*, right-click any value and navigate to *Group…*
* The grouping will automatically work out the start and end values, leave these and set a grouping size in the *By:* section.

3.

It seems the churn rate does decrease over time. Now, investigate how this decrease behaves through the different types of contracts.

**Hint**

Drag Contract Type to *Columns*.

4.

**We can see that Month-to-Month contracts have the biggest churn, as expected, but which Account Length group has the biggest gap between One Year and Two Year contracts?**

* 37-48
* 61-72
* 25-36

**Hint**

In your PivotTable, you should have:

* Columns: Contract Type
* Rows: Account Length (in months)
* Values: Sum of Churned Rate %

*If you're still stuck, review the solution in 3\_1\_overview.xlsx from the Workbooks folder.*