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| , RD Dep.  **POWER BI** |
| Introduction to Power BI |

# Installation OF NECESSARY TOOLS

## Download Power BI Desktop installation file

* Go to [link](https://aka.ms/pbiSingleInstaller) to download Power BI Desktop application
* Choose PBIDesktopSetup.exe
* Launch Power BI Desktop and log in using your EPAM account:



## Download SQL MANAGEMENT STUDIO installation file

* Go to [Download SQL Server Management Studio (SSMS)](https://go.microsoft.com/fwlink/?linkid=2108895&clcid=0x409)
* Run SSMS-Setup-ENU.exe

# Install Adventure Works DWH

## Download Adventure Works file

* Go to [Download Adventure Works DWH](https://github.com/Microsoft/sql-server-samples/releases/download/adventureworks/AdventureWorksDW2017.bak)
* **Download AdventureWorksDW2017.bak file**
* **Run SQL Server Management Studio**
* **Log into your local server using Windows credentials:**

**Graphical user interface, text, application, email

Description automatically generated**

* **Right-click on the Databases option in browser and select ‘Restore Database’:**

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* **Inside the opened window select Device and click on ‘…’ button. Click ‘Add’ and select the AdventureWorksDW2017.bak file:**

A screenshot of a computer

Description automatically generated with medium confidence

* **Click OK to restore the database.**

# Building a simple Power BI Report

## Load Data

1. In Power BI Desktop Press **Edit Queries** and click on New Source in the opened window.
2. In the **Get Data** window choose **SQL Server Database** and click **Connect.**
3. Provide the local server name in the format EPXXXXXXXX\SQLEXPRESS in the SQL Server Database window. You can leave the **Database** field empty (provide your Windows credentials if asked).
4. In the navigator window expand **AdventureWorks** database and select **FactInternetSales** table**.** Click on **Select Related Tables** button to add the following tables**:**

Graphical user interface, table

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1. **C**lick Transform Data.

## Basic Data Transformation

1. You will see Power Query editor open (see the screenshots below). In Power Query Editor, check that all the selected tables were loaded.
2. Create a column with full Customer name:

* Select DimCustomer table
* Duplicate ‘First Name’ and ‘Last Name’ columns by right-clicking on the column and selecting ‘Duplicate Column’.
* Select the duplicated columns using Ctrl buttons
* Click on ‘Merge Columns’ button

Graphical user interface, text, application, Word

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* Select Space as a separator for the new ‘Full Name’ column

1. Change column type:

* Select ‘DiscountPct’ column in ‘DimPromotion’ table.
* Change Data Type to Percentage:

Provide a screenshot of the steps as well as a screenshot showing the result in your homework.

1. Calculate the length of Promo campaign:

* Option #1

Select ‘StartDate’ and ‘EndDate’ columns in ‘DimPromotion’ table and apply option for Date Subtraction.

* Option #2

Create a Custom Column and type the necessary Custom column formula.

The name of new column – “Promotion, days”

Graphical user interface, text, application

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* *If you don’t see the transformation steps, try to enable Query Settings:*

Graphical user interface, table

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## ADDING NEW TABLES

Load additionally ‘**DimProductSubcategory’** and ‘**DimProductCategory’** tables from AdventureWorks.

## DATA PROFILING

Click on the **View** tab and select options **Column Quality, Column distribution**and**Column profile.**

Graphical user interface, application

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Provide a screenshot of the result in your homework.

## PIVOT COLUMN

1. Create column ‘Order Year’ based on the ‘OrderDate’ column in the table ‘FactInternetSales’:

* On the **Add Column** tab select **Custom Column.**
* Extract year from the ‘OrderDate’ column.

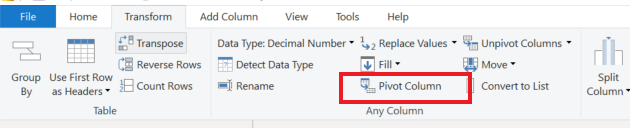
 Provide a screenshot of the result in your homework.

1. Create a new table based on ‘FactInternetSales’:

* Right button click on the table ‘FactInternetSales’ choose **Reference** in the context menu.
* Set the new name ‘SalesByYearsNPrice’ for the created table.
* In the new table choose the columns ‘Order Year’, ‘OrderQuantity’, ‘DiscountAmount’, ‘SalesAmount’ using **CTRL** button for multiple selection.
* Right-click on the title of a selected column and click on the **Remove Other Columns** option.

Include the screenshot of the table view to your lab report.

1. Choose column ‘Order Year’ (‘SalesByYearsNPrice’ table), navigate on the **Transform**tab and click on **Pivot Column**



After the **‘Pivot column’** window appears select **Values Column** = **SalesAmount.**

Include the screenshot of the result to your lab report.

## TABLE JOINING

Create a new table ‘SalesByCountry’ in a way you did it in the task 4.5.

‘SalesByCountry’ should contain columns:

* ProductKey,
* Order Year,
* SalesAmount,
* SalesTerritoryKey.

Join ‘SalesByCountry’ and ‘DimSalesTerritory’ tables:

* On the **Home** tab select **Merge Queries**-> **Merge Queries**.
* In the **‘Merge’** window select tables that you are planning to join and the key fields for the relations.
* Select **Left Outer** type of join.
* After the tables are joined, click on the expand icon of the joined column to show the ‘Sales territoryCountry’ column in the new table.
* Join DimProductCategory[EnglishProductCategory] column in the same way. **(Hint: To complete this task you need to join 3 tables).**

Describe the process and include the screenshot of the result to your lab report.

## GROUPING DATA

* Navigate to the **Transform** tab and click on the **Group By** option.
* In the new **Group By** window choose **Advanced option**.
* Set the columns ‘Order Year’, ‘SalesTerritoryCountry’ and’ EnglishProductCategoryName’ as grouping columns by using **Add grouping** button.
* Set ‘Sales’ as a **New column name**, choose **Sum** as **Operation** and **SalesAmount**as **Column**.
* Click **OK**.
* Sort table by ‘Order Year’.

Describe the result in your report.

## Load Data

* Press Close & Apply button on the Home area of the ribbon to load data into the report.
* Go to File -> Save as and save the report with PowerBILab1\_[YourLastName] as project name.

## IMPORT VS DIRECT QUERY

1. Create a new .pbix file and connect to the source using Direct query.
2. Describe the difference between **Import and Direct query** based on the results.

## WORKING WITH POWER BI MODEL

1. Open the report.
2. Switch to Modelling View. Check the relationship that were automatically created during data load

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1. Review the Cardinality, Cross filter direction and Active/Inactive relationships. We are going to work with OrderDate as the main Date for the analysis, so remove other relationships between **FactInternetSales** table and **DimDate** and make the OrderDate connection active.

# Create lab report

Create lab report and commit to gitlab the below artifacts:

1. Word document with screenshots and progress description
2. PBIX file with the resulting report.