Course 3 workplace scenarios

Waze

Project goal:

Waze leadership has asked your data team to develop a machine learning model to predict user churn. An accurate model will help prevent churn, improve user retention, and grow Waze's business.

Background:

Waze's free navigation app makes it easier for drivers around the world to get to where they want to go. Waze's community of map editors, beta testers, translators, partners, and users helps make each drive better and safer.

Scenario:

Your team is still in the early stages of their user churn project. So far, you've completed a project proposal, and used Python to inspect and organize Waze's user data. Now, the data is ready for exploratory data analysis (EDA) and further data visualization.

Course 3 tasks:

- Clean data
- Handle outliers
- Perform EDA
- Visualize data
- Share an executive summary with the Waze data team

Note: *The story, all names, characters, and incidents portrayed in this project are fictitious. No identification with actual persons (living or deceased) is intended or should be inferred. And, the data shared in this project has been created for pedagogical purposes.*

Key Takeaways

In Course 3, Go Beyond the Numbers: Translate Data into Insights, you explored the process of exploratory data analysis (EDA). You learned to Identify the core steps, basic methods, and benefits of structuring and cleaning data. Additionally, you investigated raw data using Python, and created data visualizations using Tableau

Course 3 skills:

- Conduct exploratory data analysis

- Create data visualization with Tableau
- Expand knowledge of Python coding
- Share insights and ideas with stakeholders

Course 3 end-of-course project deliverables:

- Complete EDA with workplace scenario dataset using Python
- Executive summary including a Tableau visualization

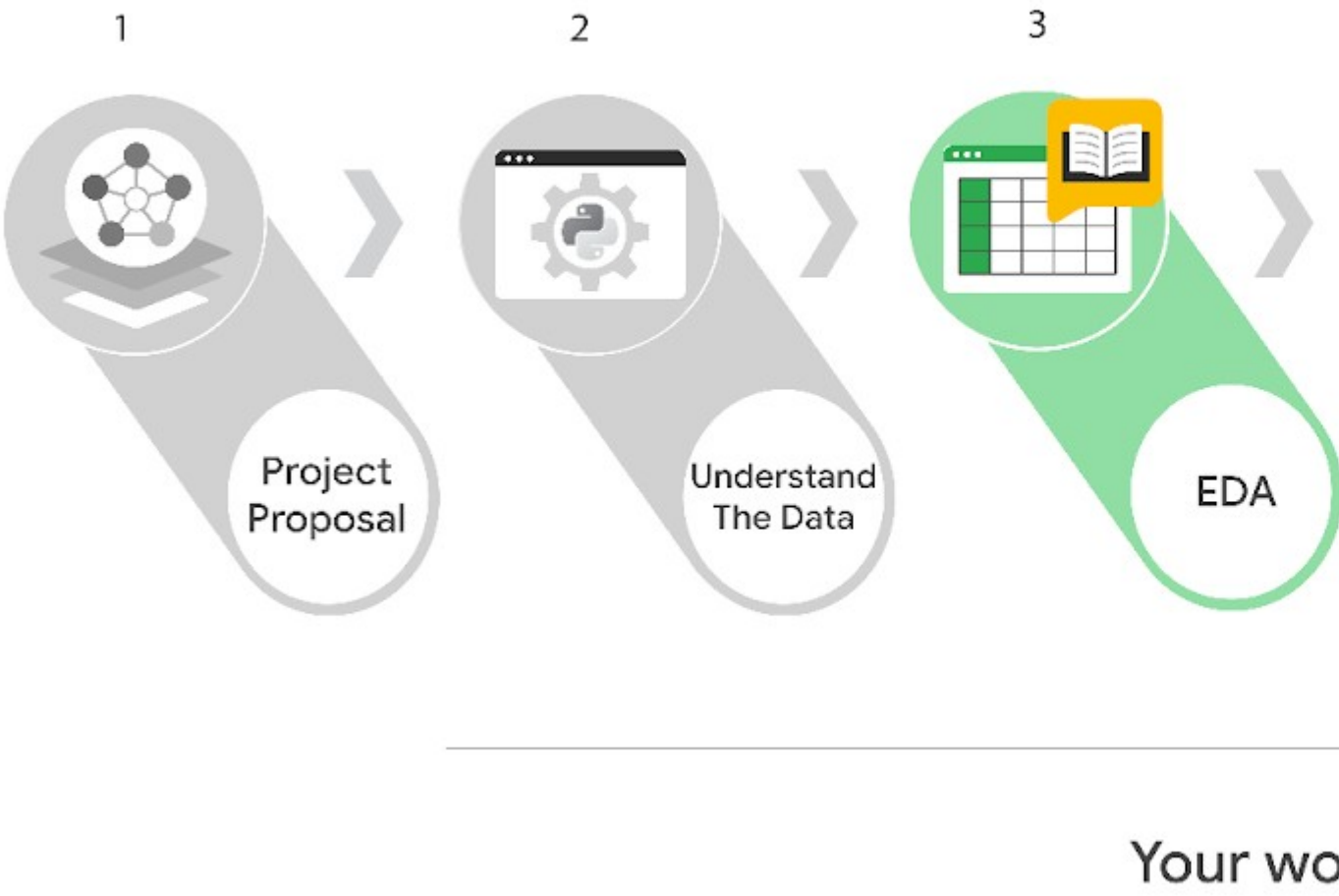
The end-of-course portfolio projects are designed for you to apply your data analytical skills within a workplace scenario. No matter which scenario you work with, you will practice your ability to discuss data analytic topics with coworkers, internal team members, and external clients.

As a reminder, you are required to complete one project for each course. To gain additional practice, or to add more samples to your portfolio, you may complete as many of the scenarios as you wish.

Course 3 end-of-course portfolio project overview: Waze

Learn about the Course 3 Waze workplace scenario!

The end-of-course project in Course 3 focuses on your ability to use exploratory data analysis to organize and understand the data within a project. As a reminder, in Course 1 you developed a project proposal that outlined milestones, which progress with each of the end-of-course projects. A visual representation is provided in the graphic shown here:



Learn more about the project, your role, and expectations in this reading.

Background on the Waze scenario

Waze's free navigation app makes it easier for drivers around the world to get to where they want to go. Waze's community of map editors, beta testers, translators, partners, and users helps make each drive better and safer. Waze partners with cities, transportation authorities, broadcasters, businesses, and first responders to help as many people as possible travel more efficiently and safely.

You'll collaborate with your Waze teammates to analyze and interpret data, generate valuable insights, and help leadership make informed business decisions. Your team is about to start a new project to help prevent user churn on the Waze app. Churn quantifies the number of users who have uninstalled the Waze app or stopped using the app. This project focuses on monthly user churn.

This project is part of a larger effort at Waze to increase growth. Typically, high retention rates indicate satisfied users who repeatedly use the Waze app over time. Developing a churn prediction

model will help prevent churn, improve user retention, and grow Waze's business. An accurate model can also help identify specific factors that contribute to churn and answer questions such as:

- Who are the users most likely to churn?
- Why do users churn?
- When do users churn?

For example, if Waze can identify a segment of users who are at high risk of churning, Waze can proactively engage these users with special offers to try and retain them. Otherwise, Waze may lose these users without knowing why.

Your insights will help Waze leadership optimize the company's retention strategy, enhance user experience, and make data-driven decisions about product development.

Project background

Waze's data team is working on the churn project. The following tasks are needed before the team can begin the data analysis process:

- EDA and cleaning
- Select and build visualization(s) type
    - Create plots to visualize variables and relationships between variables
- Share your results with the data team

Your assignment

You will conduct exploratory data analysis on data for the churn project. You'll also use tools to create visuals for an executive summary to help non-technical stakeholders engage and interact with the data.

Team members at Waze

Data team roles

- Harriet Hadzic - Director of Data Analysis
- May Santner - Data Analysis Manager
- Chidi Ga - Senior Data Analyst
- Sylvester Esperanza - Senior Project Manager

Data team members have technical experience with data analysis and data science. However, you should always be sure to keep summaries and messages to these team members concise and to the point.

Cross-functional team members

- Emrick Larson - Finance and Administration Department Head
- Ursula Sayo - Operations Manager

Your Waze team includes several managers overseeing operations. It is important to adapt your communication to their roles since their responsibilities are less technical.

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Specific project deliverables

With this end-of-course project, you will gain valuable practice and apply your new skills as you complete the following:

- Complete the questions in the Course 3 PACE strategy document
- Answer the questions in the Jupyter notebook project file
- Clean your data, perform exploratory data analysis (EDA)
- Create data visualizations
- Create an executive summary to share your results

Good luck with this project! Your Waze team members are looking forward to seeing how you communicate your creative work and approach problem-solving!

Key takeaways

The Google Advanced Data Analytics Certificate end-of-course project is designed for you to practice and apply course skills in a fictional workplace scenario. By completing each course's end-of-course project, you will have work examples that will enhance your portfolio and showcase your skills for future employers.

Activity Overview

In this activity, you will demonstrate your ability to organize, present, and share the stories within data. You will also update team members through an executive summary, demonstrating your ability to organize and communicate key information.

For additional information on how to complete this activity, review the previous readings: *End-of-course project introduction* and *Course 3 end-of-course portfolio project overview: Waze*.

Be sure to complete this activity before moving on. The next course item will provide you with completed exemplars to compare to your own work. You will not be able to access the exemplars until you have completed this activity.

Scenario

Your team is making progress on their project to develop a machine learning model to predict user churn. So far, you've completed a project proposal and used Python to inspect and organize Waze's user data.

You check your inbox and notice a new message from Chidi Ga, your team's Senior Data Analyst. Chidi is pleased with the work you have already completed and requests your assistance with Exploratory Data Analysis (EDA) and further data visualization. You also notice a follow-up email from the Director of Data Analysis, Harriet Hadzic. Harriet suggests including an executive summary of your analysis to share with teammates.

Note: *Team member names used in this workplace scenario are fictional and are not representative of Waze.*

Email from Chidi Ga, Senior Data Analyst

Subject: EDA & Data Viz

From: "Chidi Ga," Chidi@waze

Cc: "May Santner," May@waze; "Harriet Hadzic," Harriet@waze

Hi there,

Thanks for the amazing work you've done so far.

We're ready to perform EDA on our user data. Has May told you what the leadership team expects when it comes to EDA? If not, think of it as a "show your work" kind of report. They will want to see a Python notebook showing the structuring and cleaning you did, and any data visualizations you created to better understand the data. To start, I suggest you create a box plot of the variable "drives," and a scatter plot of the variables "drives" and "sessions." Feel free to add any other visuals you think are useful.

By the way, I cc'd our director, Harriet Hadzic, who is on the leadership team and will be reviewing our analysis. @Harriet, I want to keep you informed on our progress!

Thanks!

Chidi Ga

Senior Data Analyst

Waze

Email from Harriet Hadzic, Director of Data Analysis

Subject: RE: EDA & Data Viz

From: "Harriet Hadzic," Harriet@waze

Cc: ""May Santner," May@waze; "Chidi Ga," Chidi@waze

Thanks for the update, Chidi!

Welcome to the team. We're so glad to have you.

Along with the notebook, it would be really helpful if you included an executive summary of your analysis attached via email.

I appreciate your help!

Harriet Hadzic

Director of Data Analysis

Waze

Step-By-Step Instructions

Follow the instructions to complete the activity. Then, go to the next course item to compare your work to a completed exemplar.

Step 1: Access the templates

To use the templates for this course item, click each link below and select *Use Template*.

Link to templates:

- Course 3 PACE strategy document
- Executive summary templates

OR

If you don't have a Google account, you can download the templates directly from the attachments below:

Activity Template_ Course 3 PACE strategy document
DOCX File
Activity Templates_ Executive summaries
PPTX File

Step 2: Access the end-of-course project lab

***Note**: The following lab is also the next course item. Once you complete and submit your end-of-course project activity, return to the lab instructions' page and click **Next** to continue on to the exemplar reading.*

To access the end-of-course project lab, click the following link and select *Open Lab*.

- Course 3 Waze project lab

Your Python notebook for this project includes a guided framework that will assist you with the required coding. Input the code and answer the questions in your Python notebook to perform EDA and create data visualizations. Here are some helpful reminders for tasks:

- Import data
- Clean data
- Explore data

- Visualize data

You will also discover questions in this Python notebook designed to help you gather the relevant information you'll need to write an executive summary for your team.

Use your completed PACE strategy document and Python notebook to help you prepare your executive summary.

Data Dictionary

This project uses a dataset called waze_dataset.csv. It contains synthetic data created for this project in partnership with Waze. Examine each data variable gathered.

The dataset contains:

14,999 rows – each row represents one unique user

12 columns

Column name	Type	Description
label	obj	Binary target variable ("retained" vs "churned") for if a user has churned anytime during the course of the month
sessions	int	The number of occurrence of a user opening the app during the month
drives	int	An occurrence of driving at least 1 km during the month
device	obj	The type of device a user starts a session with
total_sessions	float	A model estimate of the total number of sessions since a user has onboarded
n_days_after_onboarding	int	The number of days since a user signed up for the app
total_navigations_fav1	int	Total navigations since onboarding to the user's favorite place 1
total_navigations_fav2	int	Total navigations since onboarding to the user's favorite place 2
driven_km_drives	float	Total kilometers driven during the month
duration_minutes_drives	float	Total duration driven in minutes during the month
activity_days	int	Number of days the user opens the app during the month
driving_days	int	Number of days the user drives (at least 1 km) during the month

Step 3: Complete your PACE strategy document

Step 4: Prepare an executive summary

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Pro Tip: Save the templates

Finally, be sure to save a blank copy of the templates you used to complete this activity. You can use them for further practice or in your professional projects. These templates will help you work through your thought processes and demonstrate your experience to potential employers.

What to Include in Your Response

Later, you will have the opportunity to assess your performance using the criteria listed below. Be sure to address the following elements in your completed activity.

Course 3 PACE strategy document:

- Answer the questions in the PACE strategy document

Course 3 Waze project lab:

- Perform Exploratory Data Analysis (EDA)
- Create data visualizations

Course 3 visualization:

- Create a scatterplot to enhance the visualization created with Python

Course 3 executive summary:

- Provide a summary of the results of your exploratory data analysis (EDA)