



## Activity Overview

In this activity, you will complete a project that showcases your ability to use Python to import, inspect, and organize 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 2 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 still in the early stages of their project to develop a machine learning model to predict user churn.

Previously, you were asked to complete a project proposal by your supervisor, May Santner. Now, you have received notice that your project proposal has been approved and your team has been given access to Waze's user data. To get clear insights, the data must be inspected, organized, and prepared for analysis. You discover two new emails in your inbox: one from May Santner, and one from your teammate, Chidi Ga. In the email, May asks for your help reviewing the data and completing a code notebook, and Chidi shares the details of the notebook. Review the emails, then follow the provided instructions to complete the PACE strategy document, the code notebook, and the executive summary.

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

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#### Email from May Santner, Data Analysis Manager

Subject: Help with coding notebook?

From: "May Santner," [May@waze](mailto:May@waze)

Cc: "Chidi Ga," [Chidi@waze](mailto:Chidi@waze)

Good morning!

I have a couple of updates on the user churn project. First off, the project proposal you completed has been approved. Thanks for all your great work so far. Second, I just received an email from our Senior Project Manager, Sylvester Esperanza, that our team has been given access to the Waze user data.

Before we begin the process of exploratory data analysis (EDA), we could really use your help with coding and prepping the data. During your interview, you mentioned that you worked with Python in your Google certificate program. You can draw on your Python skills for this task.

Chidi Ga (cc'd above) started a Jupyter notebook with the relevant dataset (imported). Right now, Chidi is busy finishing up a previous project. I'm sure he could use your assistance in completing the coding and setting up the notebook for the user churn project.

Chidi, do you mind sharing the details?

Best,

May Santner

Data Analysis Manager

Waze

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#### Email from Chidi Ga, Senior Data Analyst

Subject: RE: Help with coding notebook?

From: "Chidi Ga," [Chidi@waze](mailto:Chidi@waze)

Cc: "May Santner," [May@waze](mailto:May@waze)

Nice to meet you (virtually)!

Hope you've enjoyed your first few weeks at Waze!

The project proposal you helped prepare covered the major points of this project, so I'll get right to how you can assist the team. Right now, a number of us are busy making adjustments to the machine learning model for another project, so your help is greatly appreciated!

Until we finish our previous project, there is no need to do a full EDA on our new user data. We'll get to that soon. Meanwhile, do you mind reviewing the imported data for the team? It would be fantastic if you could include a summary of the data types for each variable, where missing values exist in the data, key descriptive statistics, and anything else code-related you think is worth sharing in the notebook. I haven't had a chance to explore the data, so I really appreciate you getting an early start on this.

Thanks,

Chidi Ga

Senior Data Analyst

Waze

### Step-By-Step Instructions

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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 2 PACE strategy document](#)<sup>↗</sup>

[Executive summary templates](#)<sup>↗</sup>

OR

If you do not have a Google account, you can download the templates directly from the following attachments:

 [Activity Template Course 2 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 2 Waze project lab](#)<sup>↗</sup>

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 inspect and organize your data. You'll find helpful reminders for tasks like:

• Loading necessary packages

• Identifying relevant data structures and summarizing data

• Extracting information from columns

• Combining or modifying data structures to create meaningful variables

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 in the next step.

## > 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
<code>abel</code>	obj	Binary target variable (“retained” vs “churned”) for if a user has churned anytime during the course of the month
<code>sessions</code>	int	The number of occurrence of a user opening the app during the month
<code>drives</code>	int	An occurrence of driving at least 1 km during the month
<code>device</code>	obj	The type of device a user starts a session with
<code>total_sessions</code>	float	A model estimate of the total number of sessions since a user has onboarded
<code>days_after_onboarding</code>	int	The number of days since a user signed up for the app
<code>total_navigations_fav1</code>	int	Total navigations since onboarding to the user’s favorite place 1
<code>total_navigations_fav2</code>	int	Total navigations since onboarding to the user’s favorite place 2
<code>driven_km_drives</code>	float	Total kilometers driven during the month
<code>duration_minutes_drives</code>	float	Total duration driven in minutes during the month
<code>activity_days</code>	int	Number of days the user opens the app during the month
<code>driving_days</code>	int	Number of days the user drives (at least 1 km) during the month

## > Step 3: Complete your PACE strategy document

The Course 2 PACE strategy document includes questions that will help guide you through the Course 2 Waze workplace scenario project. Answer the questions in your PACE strategy document to prepare to use Python to inspect and organize your data.

As a reminder, the PACE strategy document is designed to help you complete the contents for each of the templates provided. You may navigate back and forth between the PACE strategy document and the Python notebook. Make sure your PACE strategy document is complete before preparing your executive summary.

## > Step 4: Prepare an executive summary

Your executive summary will keep your teammates at Waze informed of your progress. The one-page format is designed to respect teammates and stakeholders who may not have time to read and understand an entire report.

First, select one of the executive summary design layouts from the provided template. Then, add the relevant information. Your executive summary should include the following:

A summary of your tasks

Information regarding the results of your data variable assessment

Identify recommended next steps in order to build a predictive model

Complete your executive summary to effectively communicate your results to your teammates.

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 self assess your performance using the criteria listed below. Be sure to address the following elements in your completed activity.

Course 2 PACE strategy document:

Answer the questions in the PACE strategy document

Course 2 Waze project lab:

Import, inspect, and organize data

Course 2 executive summary:

A summary of your tasks

Information regarding the results of your data variable assessment

Identify recommended next steps in order to build a predictive model