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# **USER MANUAL**

## **IMPROVING FITNESS WITH DATA**

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Welcome to the User Manual for our application designed to revolutionize the way you analyze and enhance your training activities! With this app you can easily download training data from your smartwatch and gain valuable insights into your fitness and performance. We've created an easy-to-use interface with two distinct sections, each serving a different purpose, so you can maximize your training potential.

In the first part, we used the power of artificial intelligence (AI) to analyze the data you submitted and infer how last week's training routine will affect your future performance. This AI-powered analysis takes into account various factors such as heart rate, distance traveled, training intensity and more, allowing you to make informed decisions and customize your training routine.

In the second part, we want to understand the importance of interactive visualizations for understanding and analyzing data sets. Our app offers a range of beautiful and informative presentations that bring your data to life. With these interactive views you can easily analyze and interpret the results of your training activities. From comprehensive graphs showing how your performance has evolved over time to correlations between numeric variables recorded during a training session, you have access to a wealth of information that can help you set realistic goals and Track your progress effectively.

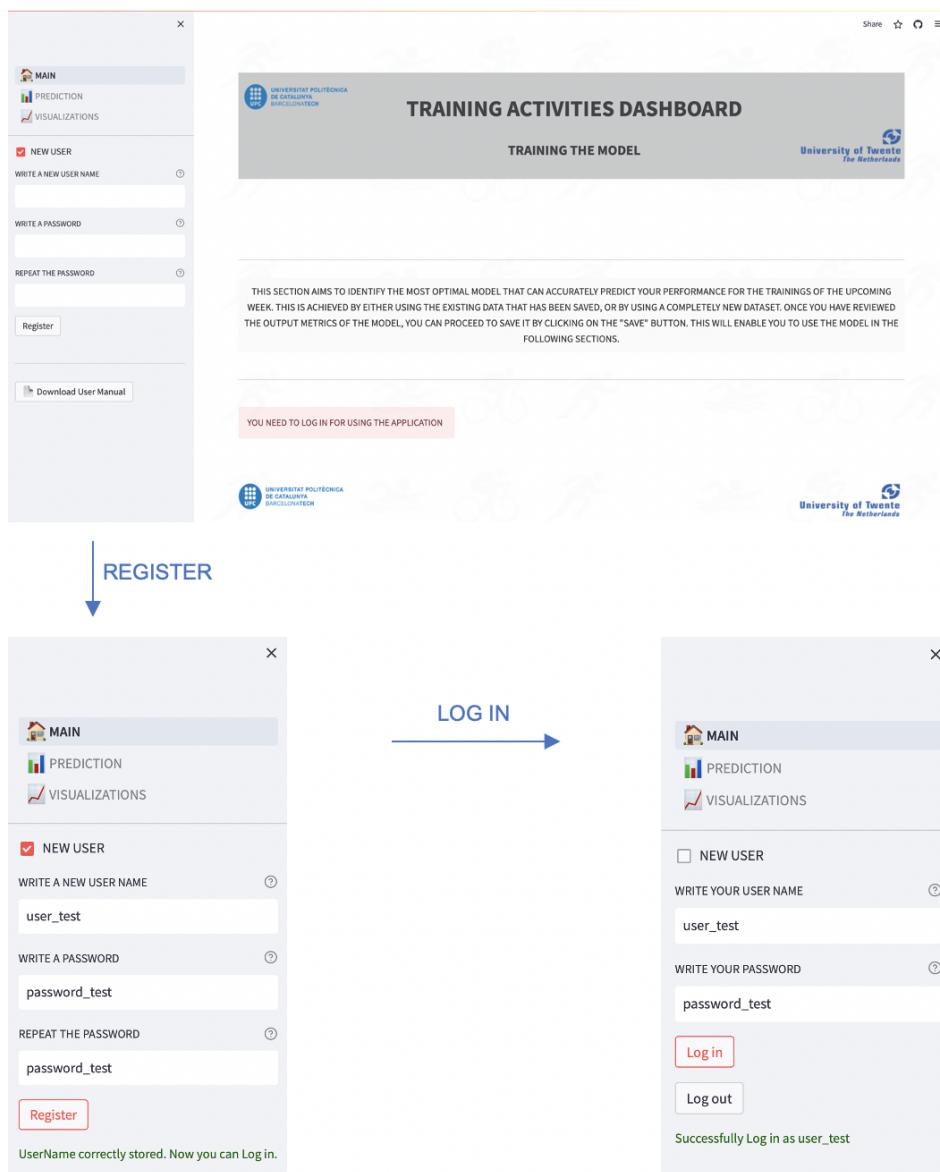
Our application performs an extensive analysis of each user's data in order to provide a personalized interface for each user profile. By combining AI-powered insights and interactive visualizations, you can better understand your training activities and thus make informed decisions about your future training routine.

In this user manual, we will guide you through every step of using our application, from the initial setup to uploading your training data, using the AI component, and interacting with visualizations. Let's dive into this steps and unlock the full potential of your training activities!

# 1 Registration

1. Access the provided [link](#) of the application.
2. On the home screen sidebar, find and select the *New User* option to activate it.
3. Create a unique username and a strong password.
4. Click on *Register* button.

If you have followed all the steps correctly, the application will notify you that the user creation process was successful. Then, uncheck the *New User* option and continue to log into the application with the newly created username and password.



When you enter the application, you will see that there are three pages: the home or configuration page, the forecast page, and the view page. You must successfully complete the setup before you can use the other two pages.

## 2 Main Page: Set up

The goal of this section is to adapt the user interface to each user's profile. Try to identify the optimal AI model given your own data.

### READ AND CLEAN THE DATA

Before using the application, you can choose between two database types: a completely new database or an already registered database. If you are a new user, choose the first option. You then need to select the type of smartwatch you are using and upload a CSV file with your workouts. This file can be downloaded from the smartwatch app and should contain meet all specified requirements.<sup>1</sup>. It is important that the file meets these requirements, otherwise the application will not be able to process your data correctly.

Currently only Garmin Forerunner, Garmin Vivoactive 4S and Garmin Fénix S6 options are available. If you're using a different smartwatch, you'll need to customize the CSV file to match some of the available smartwatch formats.

After selecting and uploading the CSV file, the app will start the data cleaning process. During this process you will receive informative communications about the processing of your data.

Since clearing the data is a bit of a hassle, the first time you load the data, it may take a long time for the app to determine if the data was read correctly. From then on, the system stores in the cache not only the cleaned databases but also the cleaning steps performed. This way, when users load the same data again, it will not consume as many resources to clean it.

When the cleaning process is complete, the application will notify you and the cleaned database will be saved to the cloud automatically. From there you can download deleted databases and grouped deleted databases for weeks.

The screenshot shows two instances of the 'READ AND CLEAN THE DATA' interface. The top instance is for 'NEW DATA' with a dropdown menu set to 'Select type of Smart Watch'. A red box highlights the dropdown menu. Below it is a 'Drag and drop file here' input field with a 'Limit 200MB per file • CSV, XLSX' note, and a 'Browse files' button. To the right is an 'EXTRA INFORMATION:' dropdown with a 'Download Requirements Data File' button. A large blue arrow points down to the second instance. The bottom instance is for 'Garmin Fenix S6' with a dropdown menu set to 'Garmin Fenix S6'. A red box highlights the dropdown menu. Below it is a 'Drag and drop file here' input field with a 'Limit 200MB per file • CSV, XLSX' note, and a 'Browse files' button. An uploaded file 'Activities.csv 0.8MB' is shown with a delete 'x' button. At the bottom, a green box highlights the 'Cleaned data as CSV' and 'Weekly data as CSV' buttons. The background features a faint illustration of a person running.

<sup>1</sup>A PDF file describing the database requirements can be downloaded from the application.

## TRAIN THE MODEL

After the data is properly processed by the app, the next step is to train the model. The purpose of this model is to determine whether the last week's training routine has been positive, negative or maintenance with respect to the following week's performance.

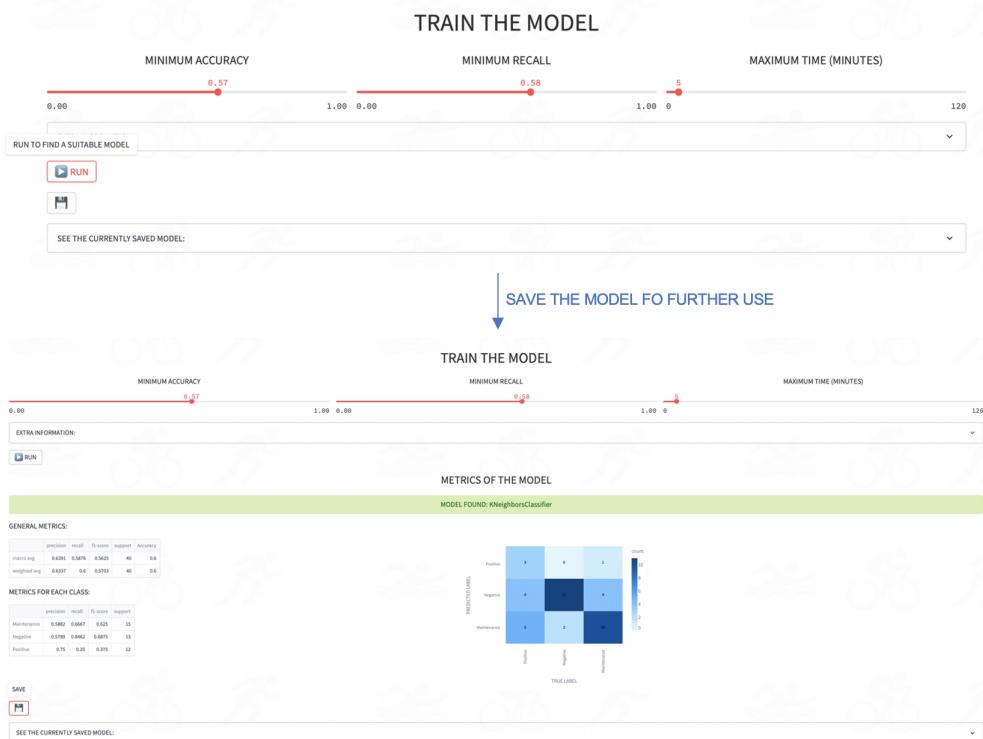
During this stage, you can set certain requirements for the model's metrics, such as a minimum level of accuracy or recall<sup>2</sup>. The app will then proceed to test multiple classification models with various configurations until it finds one that meets the specified metrics.

You also have the option of setting a maximum time limit for the model search. If the time limit is reached and a suitable model has not been found, the app will stop the search. In such cases, you may need to adjust your requirements for accuracy or recall, and search for a model with lower performance standards.

After successfully finding a suitable model, the app will display various detailed metrics, including the confusion matrix and F1 score. This allows you to thoroughly evaluate the model's performance and determine whether it meets their expectations. If you are satisfied with the model, you must save it by clicking the *save* button. Then, this model will be used in the subsequent sections of the app.

It is important to note that you can always access and review the metrics of the saved model.

Up to this point, you can use all the functionalities of the application.



<sup>2</sup>The definition of these metrics are detailed in the application

## 3 Prediction page

This page uses the pre-trained and stored AI model. It allows you to load data from your last weekly training routine and visualize how it will affect your fitness in the following week. To use it, follow the following steps:

Firstly, your are required to input your new training activities, making sure that there are no null values and that the data is within the specified metrics.

To continue, click on the *Done* button. This will lead the application to process the data that you have just entered and use the AI model to display the corresponding results week-by-week. You will see the following:

- Gauge chart: This shows your weekly fitness percentage, which is calculated by comparing your past week's training to your overall fitness history. This comparison evaluates your current physical condition with your personal best and worst levels.
- Label of the week: It can be either positive, or negative, or maintenance. This is the effect on your future performance.
- Recommendation messages: helpful suggestion message about your training routine that may help you improve your performance.

Finally, you have the option to save the displayed results. Saving them will also add the newly reported activities to the stored database. This is especially useful because as the database grows, you can go back to the main page and use the *saved data option* to find a model with better metrics.

**NEW WEEKS**

MODIFY THE FOLLOWING DATASET ACCORDING TO THE ACTIVITIES YOU HAVE DONE DURING THE LAST WEEK. THEN PRESS THE BUTTON.

ActivityType	Date	Distance	Calories	Time	AveragePulse	MaxPulse	AvgSpeed	MaxSpeed	Stamina	Endurance	Agility	MuscleTone	Recovery	Temperature	HumidTemp	MovingTime	PropelTime	MovingDist	PropelDist	Endurance
Swimming	2023-04-03	1000	600	120	150	200	150	250	100	150	100	100	100	100	100	100	100	100	100	

**ADD NEW DATA**

**NEW WEEKS**

MODIFY THE FOLLOWING DATASET ACCORDING TO THE ACTIVITIES YOU HAVE DONE DURING THE LAST WEEK. THEN PRESS THE BUTTON.

ActivityType	Date	Distance	Calories	Time	AveragePulse	MaxPulse	AvgSpeed	MaxSpeed	Stamina	Endurance	Agility	MuscleTone	Recovery	Temperature	HumidTemp	MovingTime	PropelTime	MovingDist	PropelDist	Endurance
Swimming	2023-04-03	1000	600	120	150	200	150	250	100	150	100	100	100	100	100	100	100	100	100	
Running	2023-04-03	2000	1200	300	180	250	180	350	150	200	150	150	150	150	150	150	150	150	150	
Swimming	2023-04-03	1000	600	120	150	200	150	250	100	150	100	100	100	100	100	100	100	100	100	

**SEE RESULTS AND SAVE THEM**

**NEW WEEKS**

MODIFY THE FOLLOWING DATASET ACCORDING TO THE ACTIVITIES YOU HAVE DONE DURING THE LAST WEEK. THEN PRESS THE BUTTON.

ActivityType	Date	Distance	Calories	Time	AveragePulse	MaxPulse	AvgSpeed	MaxSpeed	Stamina	Endurance	Agility	MuscleTone	Recovery	Temperature	HumidTemp	MovingTime	PropelTime	MovingDist	PropelDist	Endurance
Swimming	2023-04-03	1000	600	120	150	200	150	250	100	150	100	100	100	100	100	100	100	100	100	
Running	2023-04-03	2000	1200	300	180	250	180	350	150	200	150	150	150	150	150	150	150	150	150	
Swimming	2023-04-03	1000	600	120	150	200	150	250	100	150	100	100	100	100	100	100	100	100	100	

**SUMMARY OF NEW WEEKS**

Date	Calories	Time	AveragePulse	MaxPulse	AvgSpeed	MaxSpeed	Stamina	Endurance	Agility	MuscleTone	Recovery	Temperature	HumidTemp	MovingTime	PropelTime	MovingDist	PropelDist	Endurance
2023-04-03	20.607	500.000	120	200	150	250	100	150	100	100	100	100	100	100	100	100	100	100

**CURRENT PHYSICAL CONDITION**

65.1

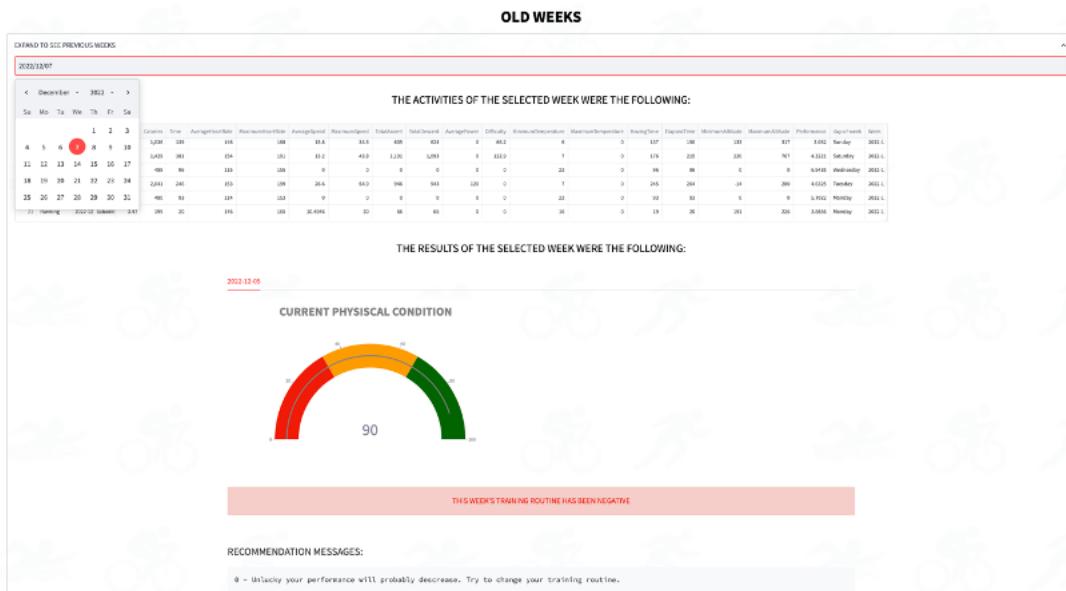
THIS WEEK'S TRAINING ROUTINE HAS BEEN NEGATIVE

**RECOMMENDATION MESSAGES:**

1 - You should try to train more days.  
2 - Unlucky your performance will probably decrease. Try to change your training routine.

APPLY THE NEW ACTIVITIES IN THE SAVED DATASET

Also, on this page you will find the option to view the results of previous weeks by expanding the *See previous weeks* bar.



## 4 Visualization page

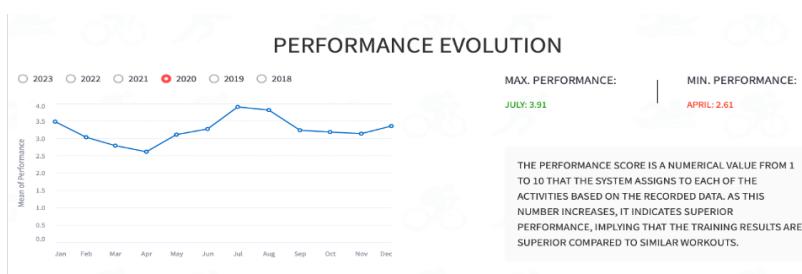
This page provides some visualizations that may help you gain insights from your recorded activities. Graphics about the evolution of the performance, maximum and minimum peak of physical condition, correlations between features and your performance, clustering of training periods, so on.

It is worth noting that all the visualizations are automatically updated when you save new data to the currently saved dataset, hence you have access to the most up-to-date information about your performance and accordingly use it to make informed decisions.

Getting into more detail, the visualizations are the following:

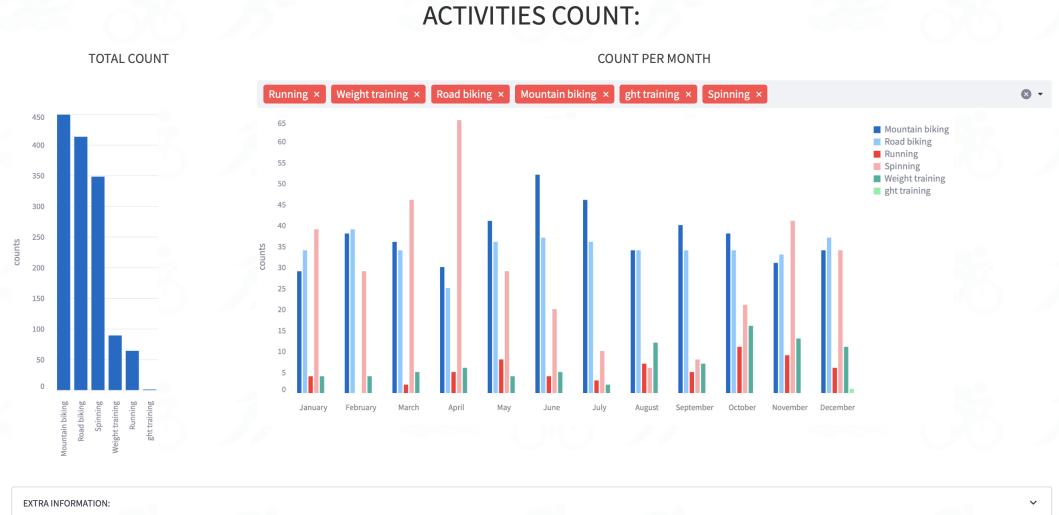
### PERFORMANCE OF EVOLUTION

This is a line plot that shows the user's performance according to their training activities for the specified year. Performance is explained to the user, and the visualization allows them to identify patterns in the data and clustering of training periods.



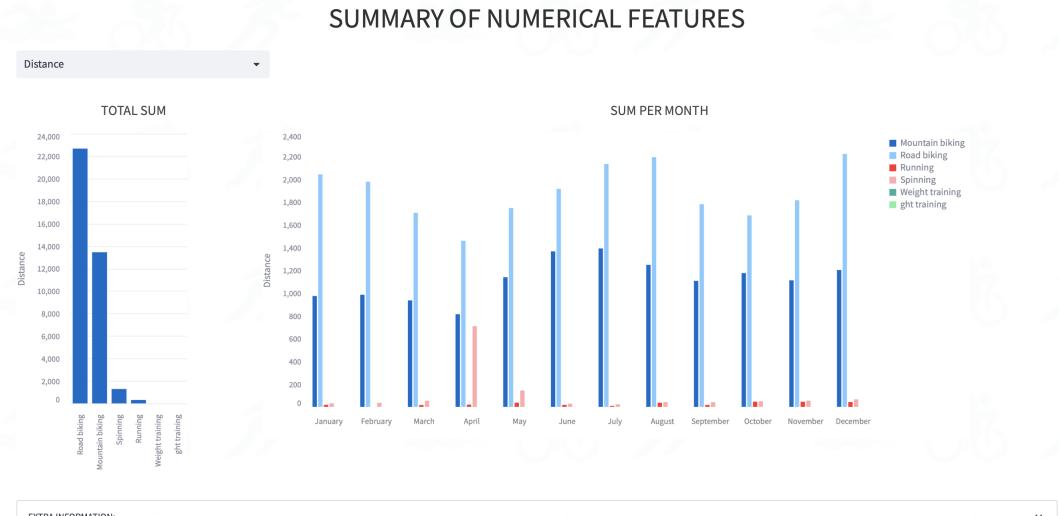
## ACTIVITIES COUNT

These are a bar and a clustered bar charts that show the number of activities for each activity type and month. This visualization helps the user identify patterns in the data, such as their preferred activity types.



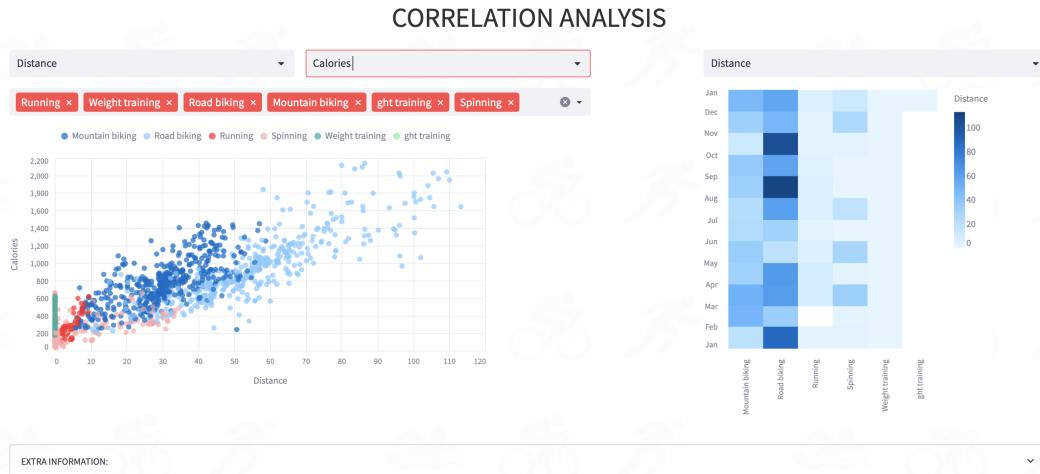
## SUMMARY OF NUMERICAL FEATURES

These are a bar and a clustered bar chart that show the total amount of a specified numerical feature for each activity type and month. For instance, this visualization allows the user to identify which activity types they have spent more time on (if the numerical feature is time), or which activity types allow them to cover more distance (if the numerical feature is distance).



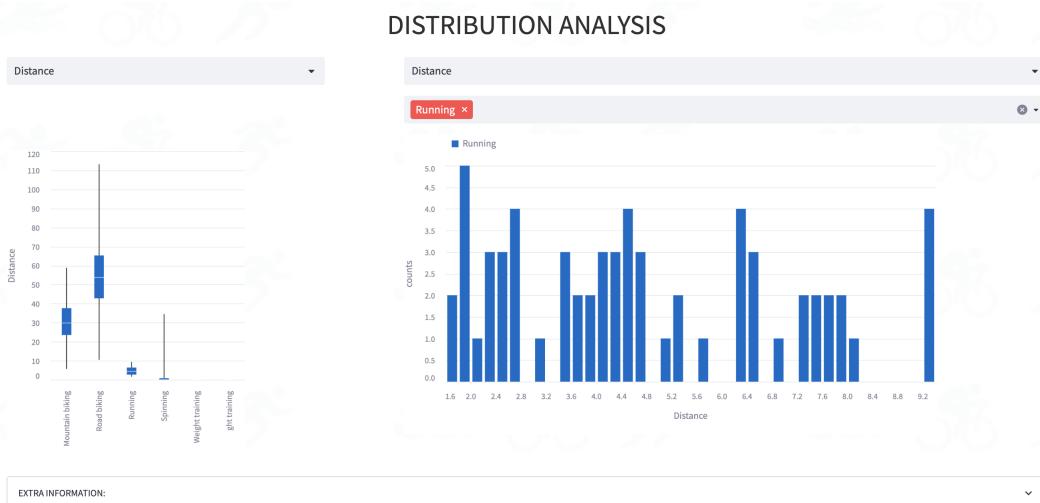
## CORRELATION ANALYSIS

These are a scatterplot and a heatmap. The first one shows the correlation between two numerical features specified by the user, filtered by activity type. The second one shows the amount of a numerical feature for each activity type and month. These visualizations help the user understand and discover correlations between numerical features.



## DISTRIBUTION ANALYSIS

This visualization includes a box plot that shows the mean and standard deviation for a specified numerical feature, and a histogram that shows the distribution of the feature, filtered by activity type. This helps the user understand the distribution of numerical features and identify any outliers or rare values.



## 5 Contact Information

If you have any questions, please do not hesitate to contact the creators at [carlamiquel-blasco2001@gmail.com](mailto:carlamiquel-blasco2001@gmail.com)