**Una estrella de color azul

Descripción generada automáticamente con confianza mediaModel Agnostic Methods**

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**Introduction**

**Partial Dependence Plot**

To analyze the influence of key environmental and temporal variables—days since 2011, temperature, humidity, and wind speed—on predicted bike rental counts, we utilized a Random Forest model visualized through Partial Dependence Plots (PDP). Each of these factors was systematically examined to understand their individual impacts on the frequency of bike rentals, as follows.

Gráfico, Gráfico de líneas

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**Days Since 2011:**

The PDP shows a fluctuating pattern, which suggests that the number of days since 2011 has a non-linear relationship with bike rentals. Peaks and troughs indicate that certain periods are more associated with higher rentals, which could be linked to seasonal effects, specific events, or changes in biking infrastructure over time.

Gráfico, Gráfico de líneas

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**Temperature:**

The plot for temperature shows an increasing trend in bike rentals as temperature rises, up to a certain point, after which it starts to plateau and slightly decline. This indicates that there is an optimal temperature range for bike rentals, which makes sense as extremely high temperatures might deter outdoor activity.

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**Humidity:**

The influence of humidity on bike rentals is relatively clear, with higher humidity levels leading to a consistent decrease in bike rentals. This trend suggests that less comfortable conditions (higher humidity) dissuade people from renting bikes.

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**Wind Speed:**

The plot for wind speed shows that as the wind speed increases, bike rentals slightly decline after remaining stable up to a certain point. This pattern could indicate that moderate wind speeds do not significantly impact bike rentals, but higher winds might negatively affect the decision to rent bikes due to increased pedaling effort or safety concerns.

The partial dependence plots provide valuable insights into how different environmental and temporal factors influence bike rentals. Understanding these relationships can help city planners and bike rental companies optimize their services according to predictable patterns in user behavior influenced by weather conditions and temporal factors. This kind of analysis also aids in targeted marketing and operational adjustments during less favorable conditions.

**Conclusion**