Getaround Analysis

Deployment

Context

- **Problem**: Car rental cancellation on Getaround platform
- **Reason**: Late car returns cause friction if next user has to wait
- **Proposition**: Introduce a buffer delay between consecutive rentals
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Tasks

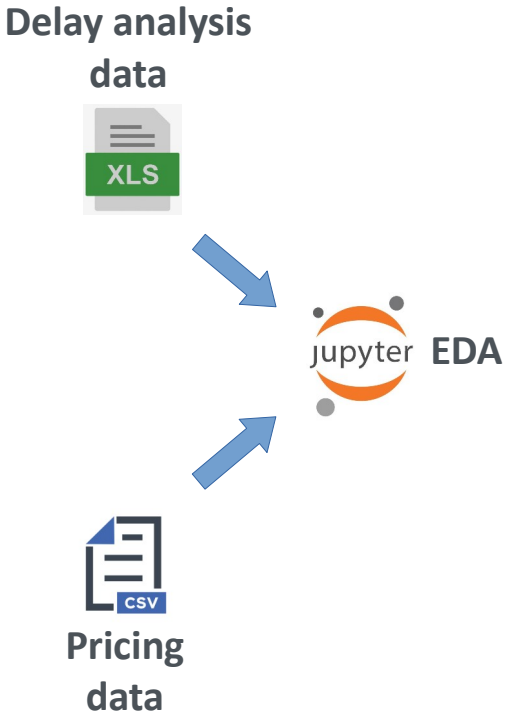
- Analyze the effect of a rental delay buffer on both checkin methods
- Produce a web dashboard to assist the decision (scope, minimum delay)
- Train car pricing optimization models
- Provide access to these models through an API endpoint
- Include the car rental pricing functionality in the web dashboard

Pipeline architecture

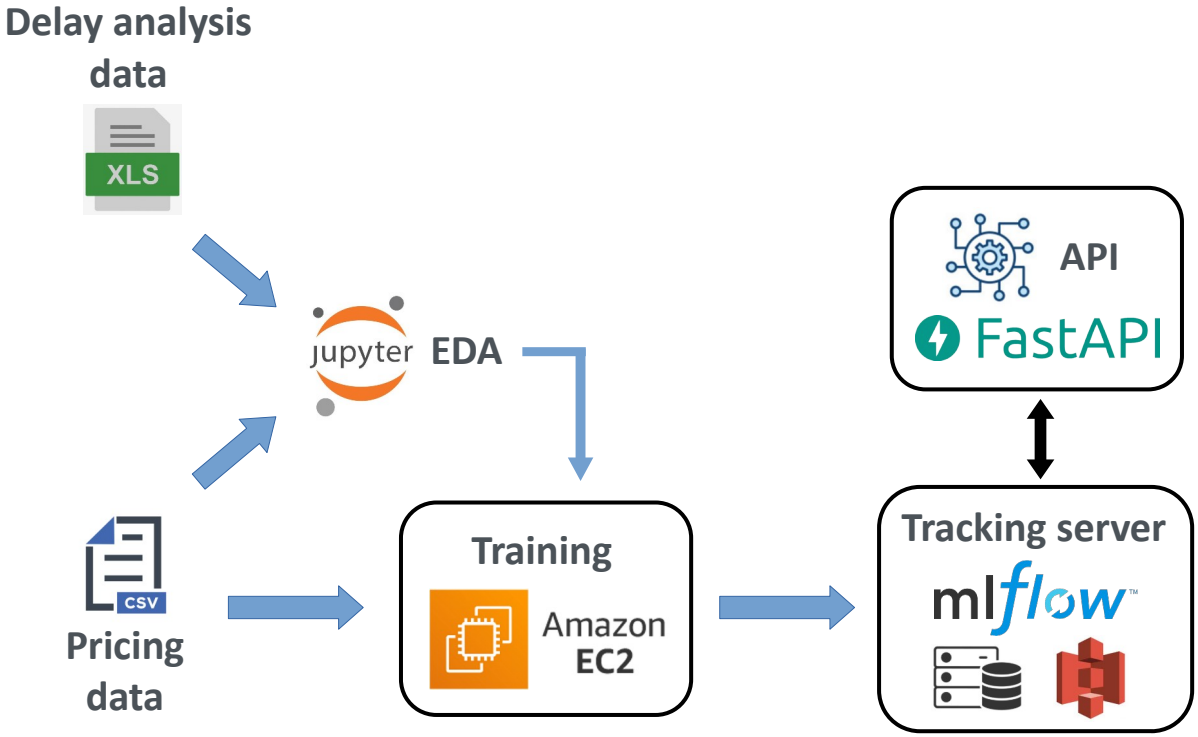
Delay analysis data

Pricing data

Pipeline architecture



Pipeline architecture



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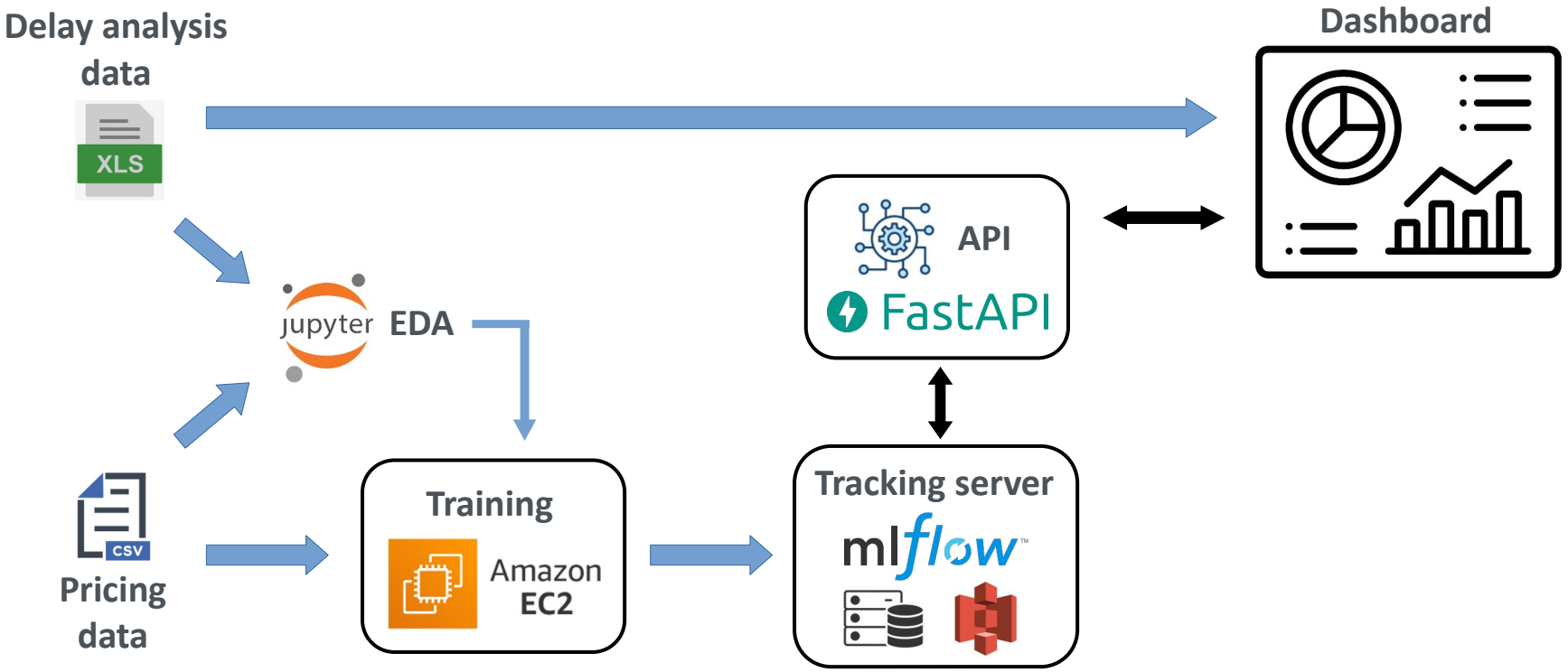

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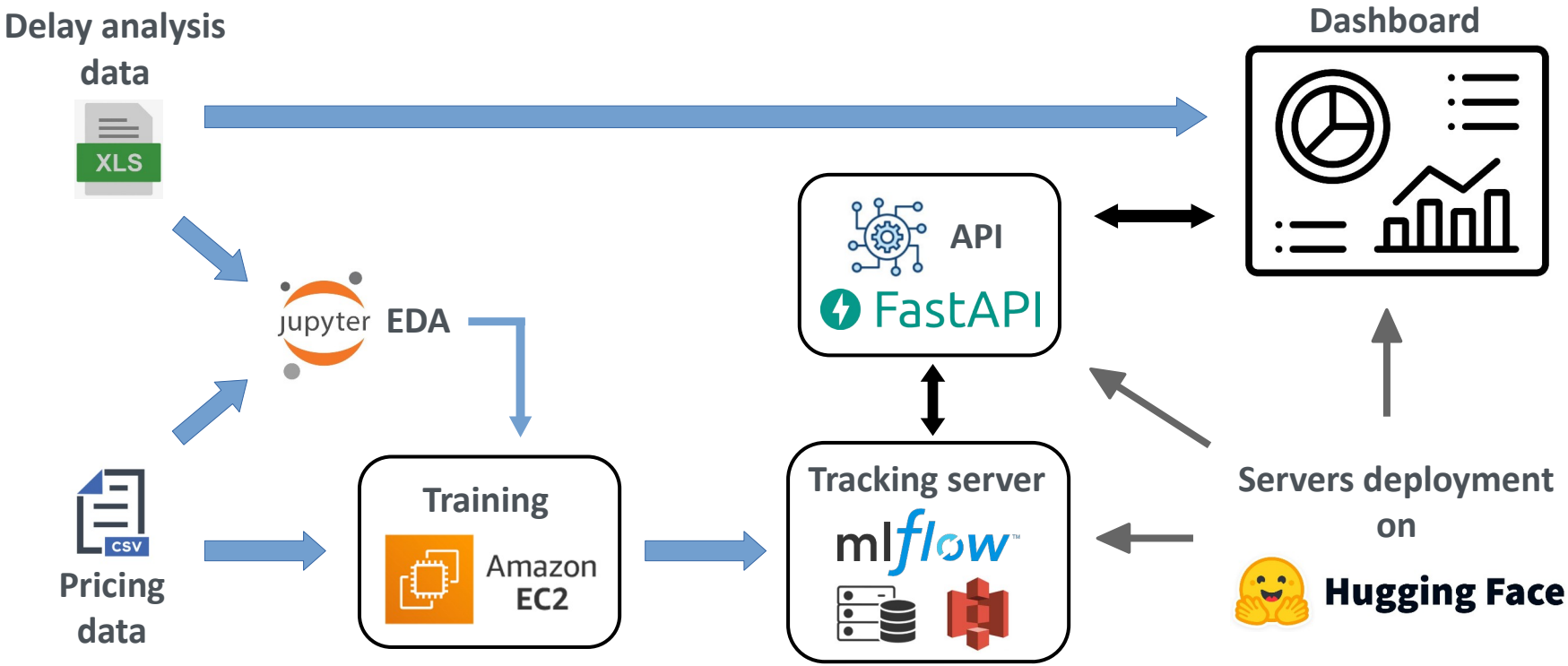

Pricing optimization API

- Two pricing models
  - Ridge regression (Ridge)
  - Gradient boosting model (GBM)

model	eval. set	MSE	RMSE	R2	MAE	MAPE (%)
Ridge	train	302.900604	17.404040	0.720073	12.198836	14.008746
	test	368.880038	19.206250	0.675800	12.990555	16.596385
GBM	train	144.302489	12.012597	0.866642	8.244311	9.476215
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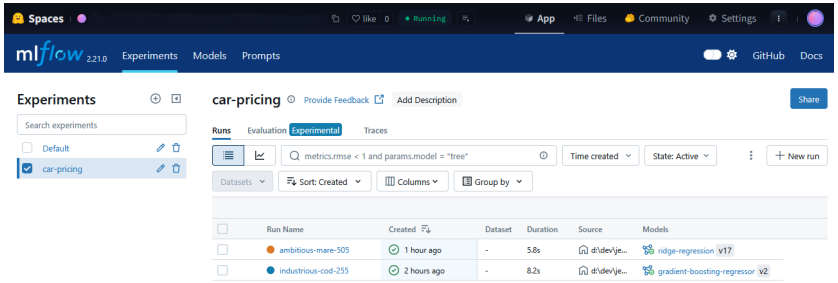
- Model training and tracking
  - Dispatch training on AWS EC2 instances (MLflow project)
  - Track and record models in Mlflow server



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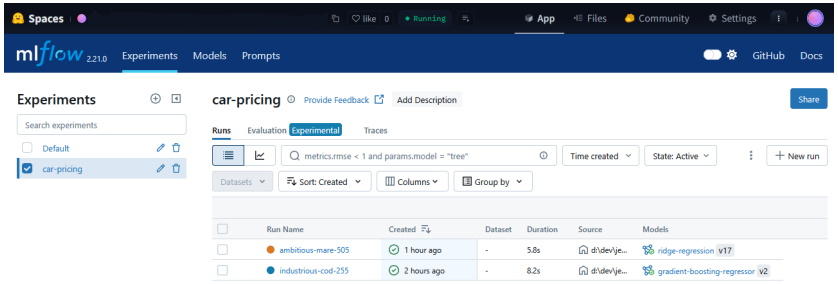
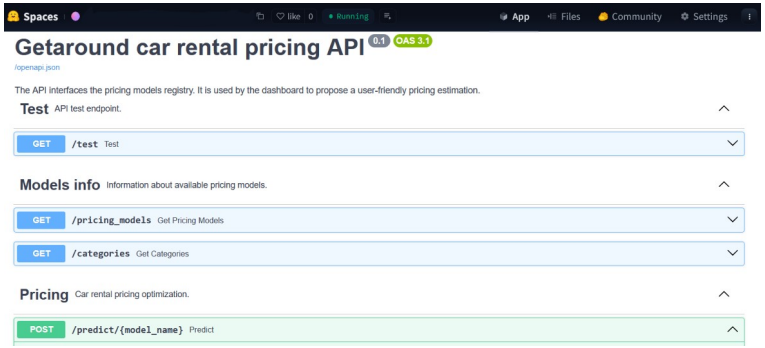
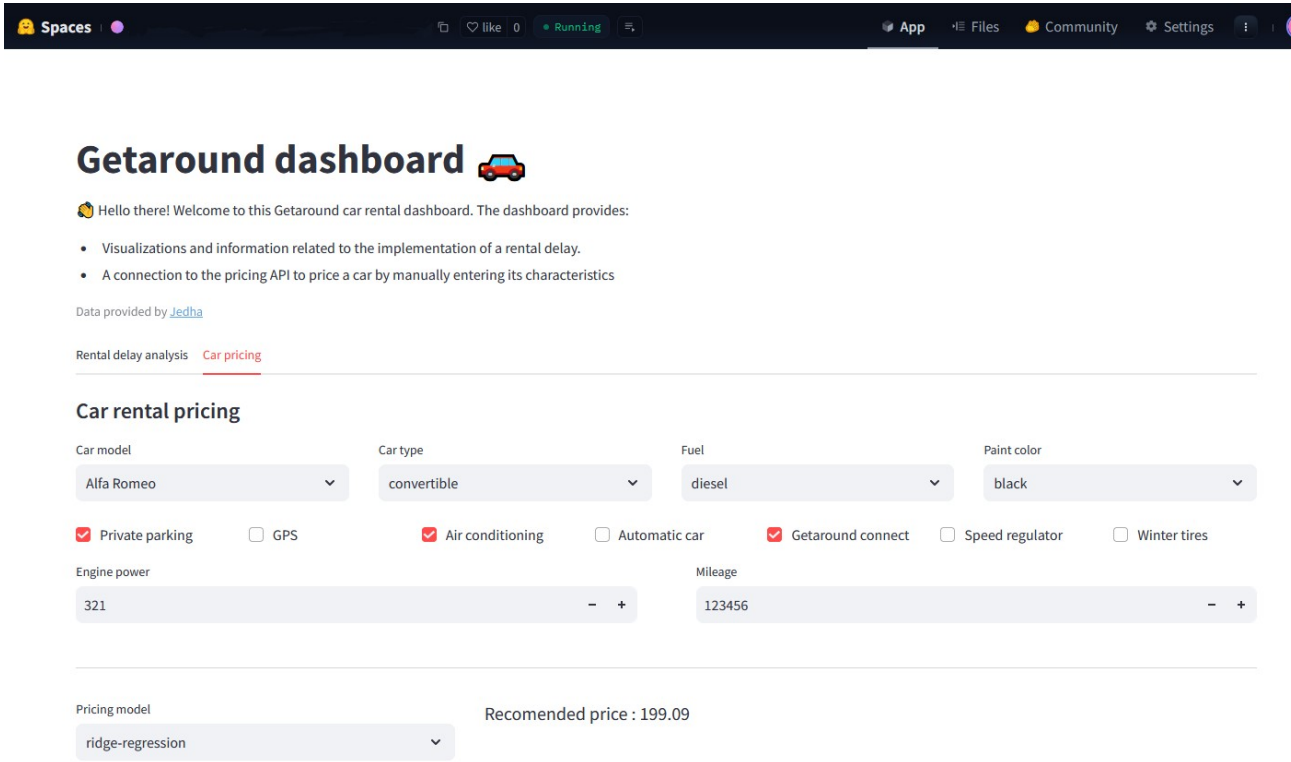


- Setup pricing API
  - Registered models prediction endpoint
  - Provides additional model information

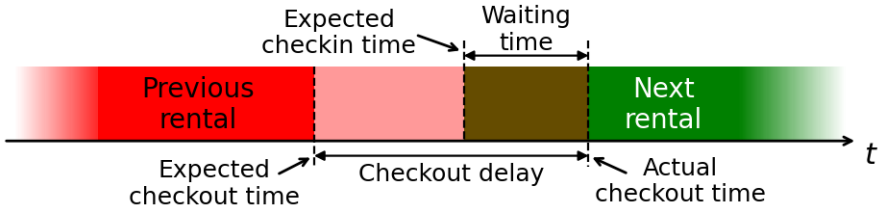


Dashboard : car rental pricing

- Check API availability at startup
- Fetch models info
- Pricing evaluation from user input (`/predict` endpoint)



Rental delay analysis



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  - Previous user is late
  - Car return delay may overlap with next rental
- Creates friction if next user has to wait

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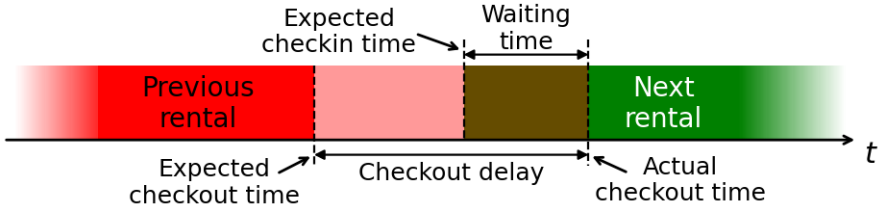

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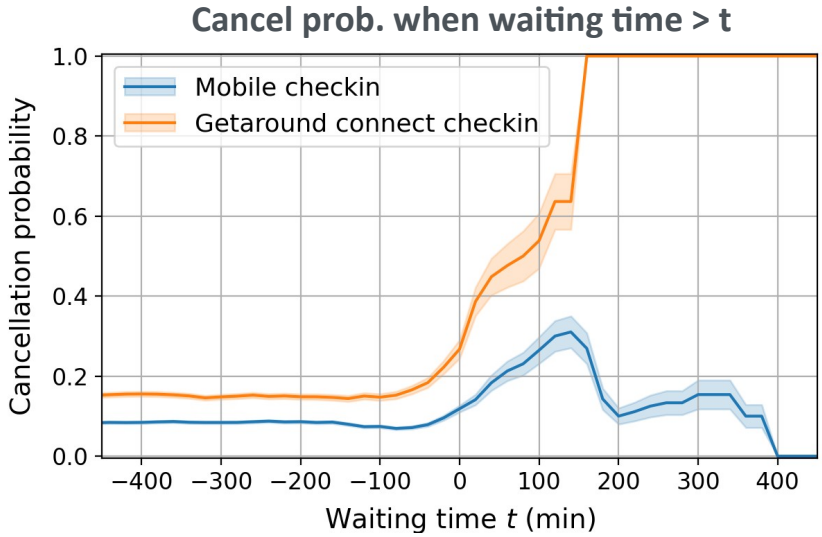
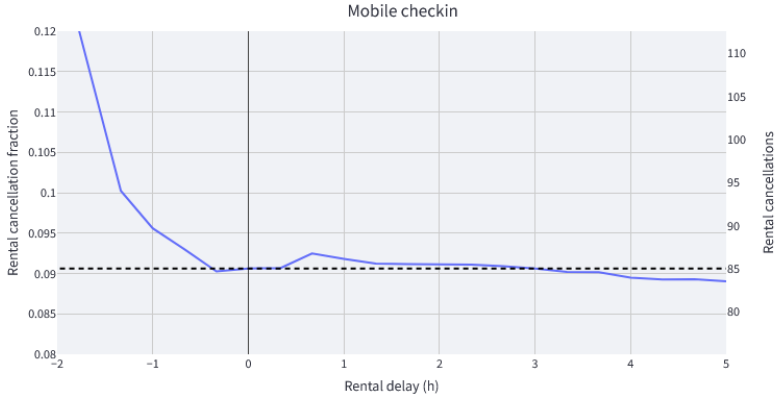
- Cancellation probability
  - Depends on waiting time
  - Depends on the checkin method (Getaround connect or mobile)

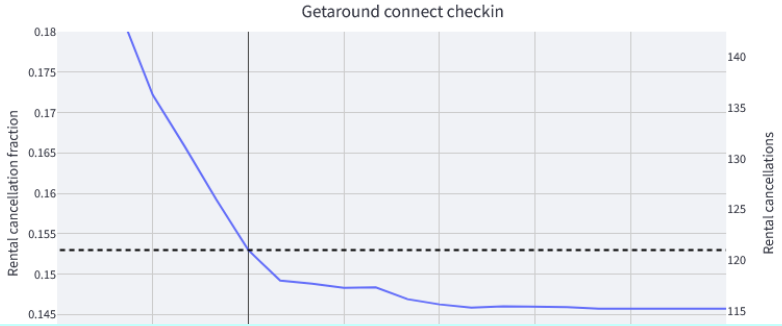


Dashboard : rental delay analysis

- Visualize the effect of a rental delay
  - Cancellation probability
  - Both checkin methods
- Summary table
- Rental delay slider
  - Quantitative insights

Car rental delay analysis





Rental delay (minutes)

120

−400 400

	connect	mobile	total
Nb rentals	791.0000	938.0000	1,841.0000
Baseline cancel rate	0.1530	0.0906	0.1191
Cancel rate	0.1462	0.0911	0.1175
Cancel rate diff	-0.0067	0.0005	-0.0016
Baseline cancel nb	121.0000	85.0000	206.0000
Cancel nb	115.6771	85.4773	201.1544
Cancel nb diff	-5.3229	0.4773	-4.8456

Thanks!