


2.4 GHZ INDOOR CHANNEL MEASUREMENTS



**MACHINE
LEARNING
PROJECT**



Data Collection

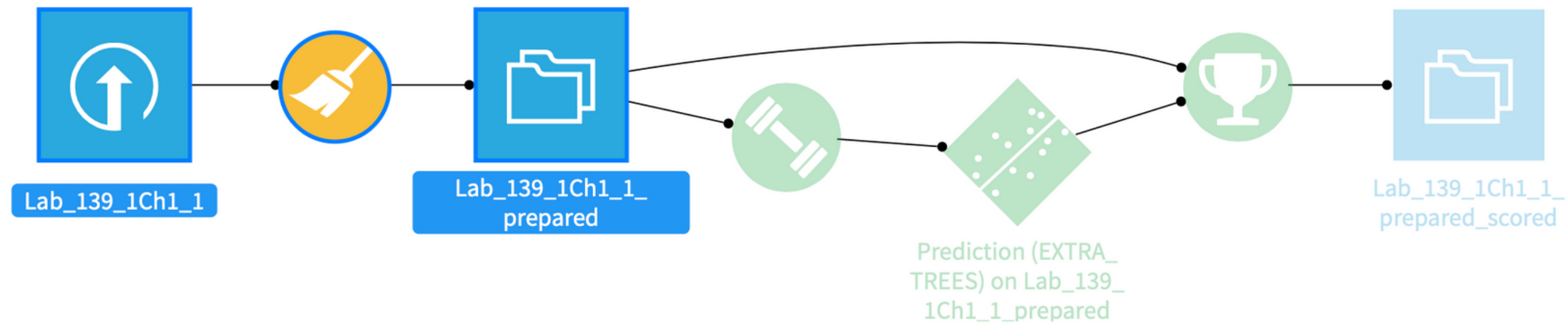
2.4 GHZ Indoor Channel Measurements DataSet

Measurement of the S21, consists of 10 sweeps, each sweep contains 601 frequency points with spacing of 0.167MHz to cover a 100MHz band centered at 2.4GHz.



2

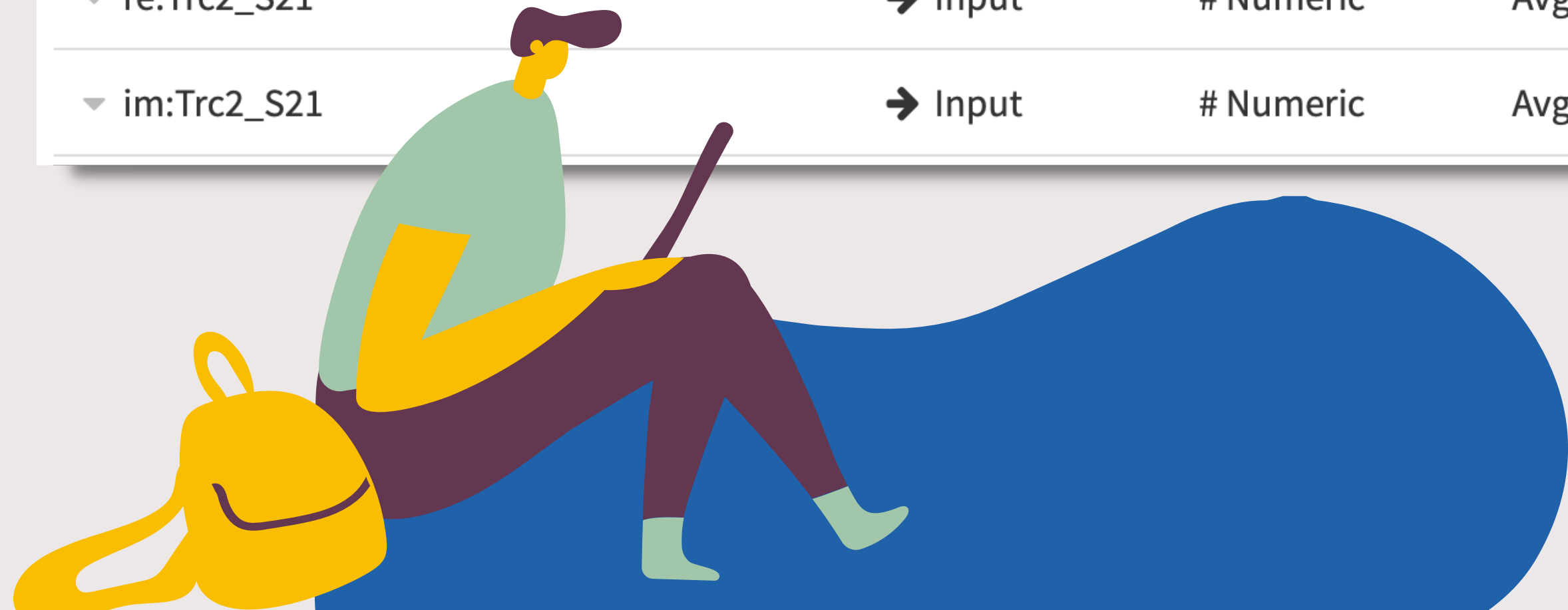
Data Processing



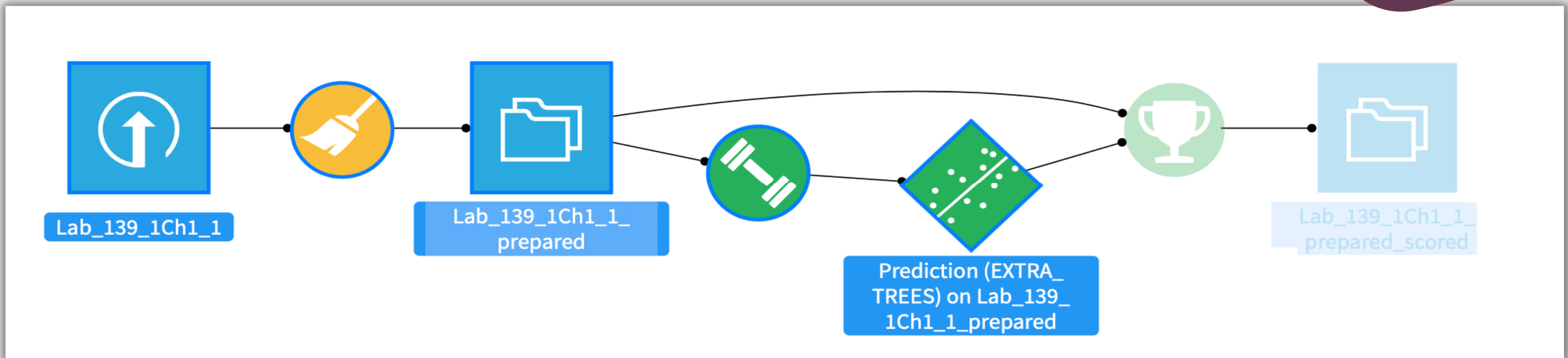


Feature Selection

▼ freq[Hz]	🎯 Target	# Numeric	
▼ re:Trc1_S11	➔ Input	# Numeric	Avg-std rescaling
▼ im:Trc1_S11	➔ Input	# Numeric	Avg-std rescaling
▼ re:Trc2_S21	➔ Input	# Numeric	Avg-std rescaling
▼ im:Trc2_S21	➔ Input	# Numeric	Avg-std rescaling



Data Mining using Extra Trees



Data Mining using Extra Trees

Algorithm details

Algorithm	Extra trees	Split quality criterion	MSE
Number of trees	100	Use bootstrap	Yes
Max trees depth	8	Feature sampling strategy	auto
Min samples per leaf	1		
Min samples to split	3		

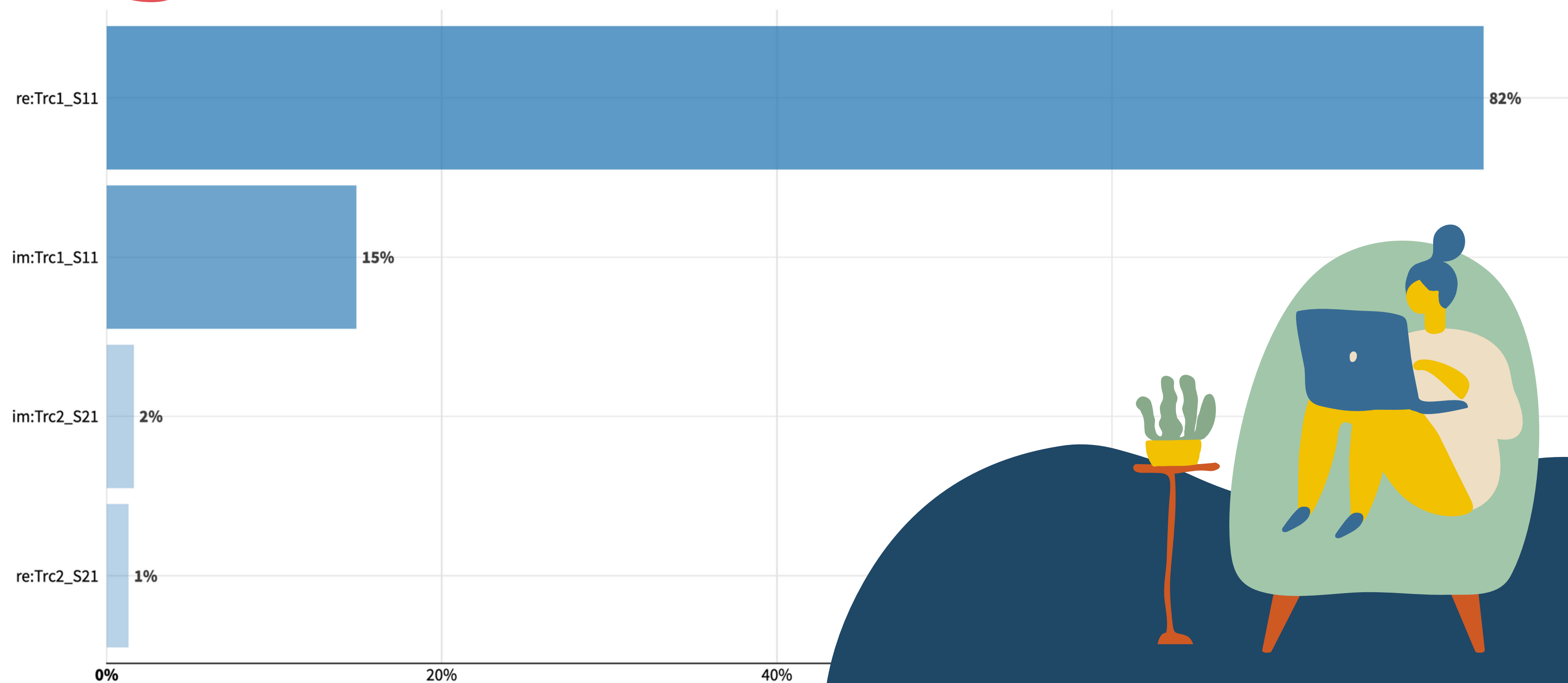
Training data

Rows (before preprocessing)	472	Rows (after preprocessing)	472
Columns (before preprocessing)	5	Columns (after preprocessing)	4
Matrix type	dense		
Estimated memory usage	14.75 KB		



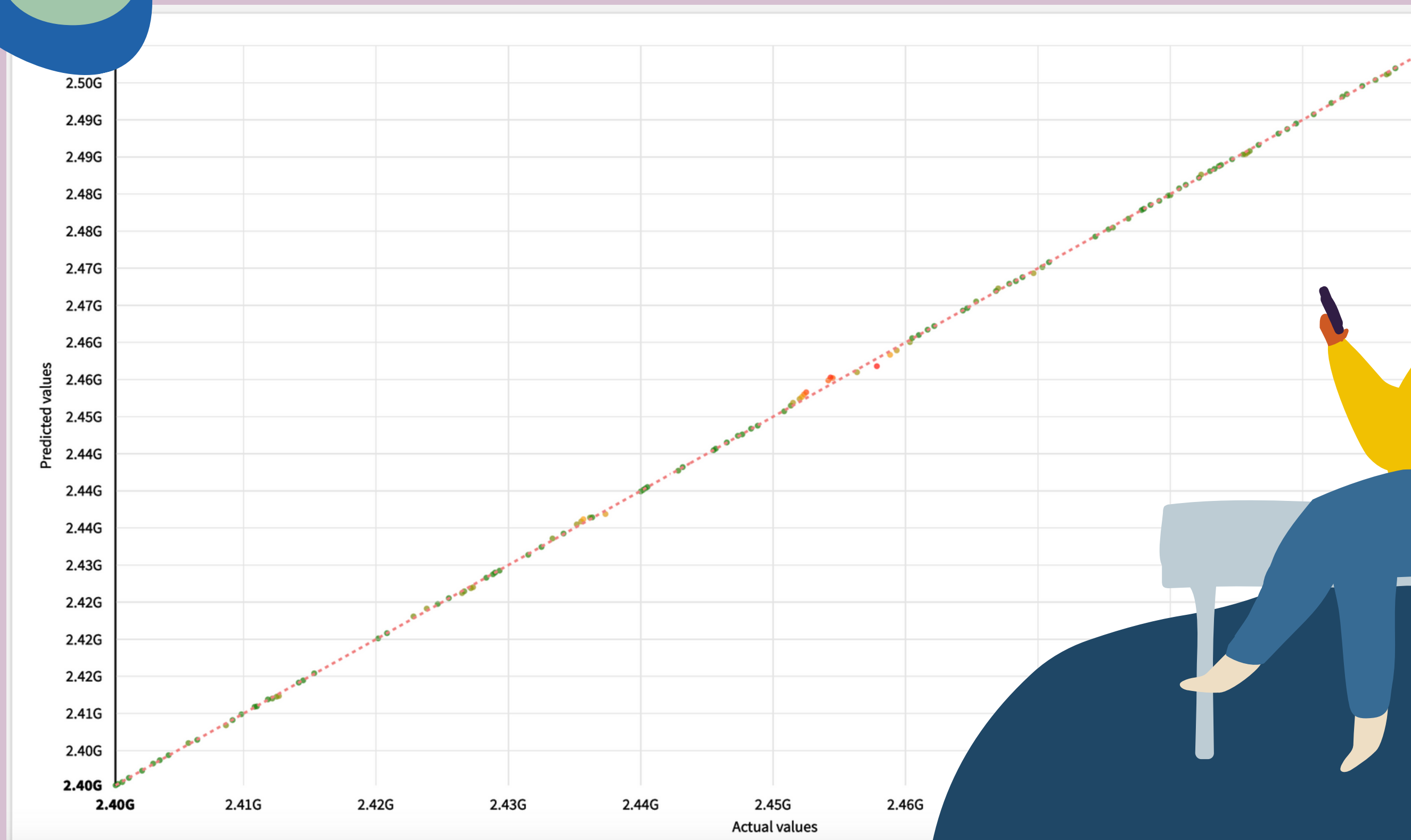


Variables Importance

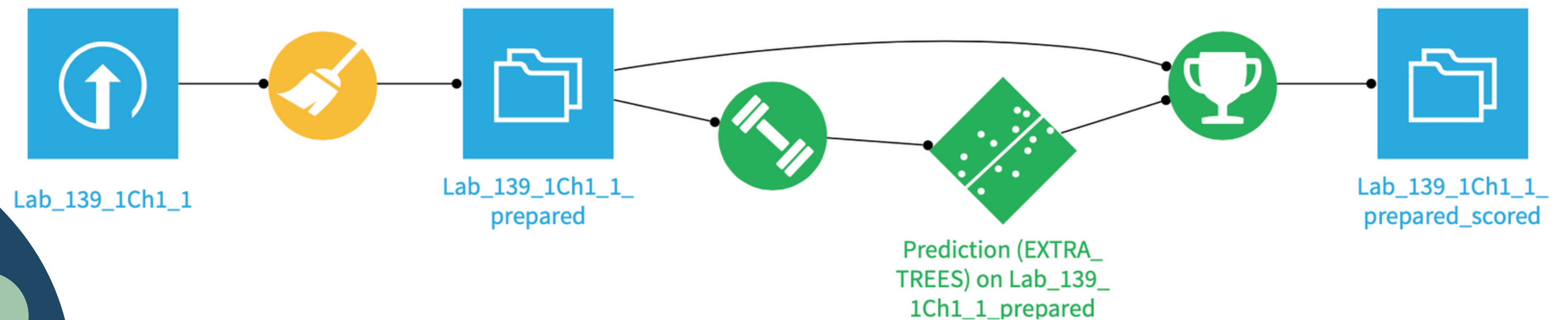




Machine Learning Results



Final Model for Prediction of 2.4Ghz Indoor Channel Measurements Accuracy : 99.99%





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