

Overall performance of the AI bird recognition tool:

- Accuracy: 85%
- Error rate: 15%

Overall performance of the autonomous driving mode:

*Measured using average distance driven between disengagements**

- Under **normal** road condition: 40 km
- During the **night**: 5 km
- On **rainy** days: 3 km
- On **snowy** days: 1 km

* Disengagement means when the automated system is switched off by the intervention of a human driver

The performance of the AI tool to predict diabetes risk

- Mean prediction error: $\pm 15\%$
- Max prediction error: $\pm 30\%$
- The AI tool can explain 75% of the variation in the training data

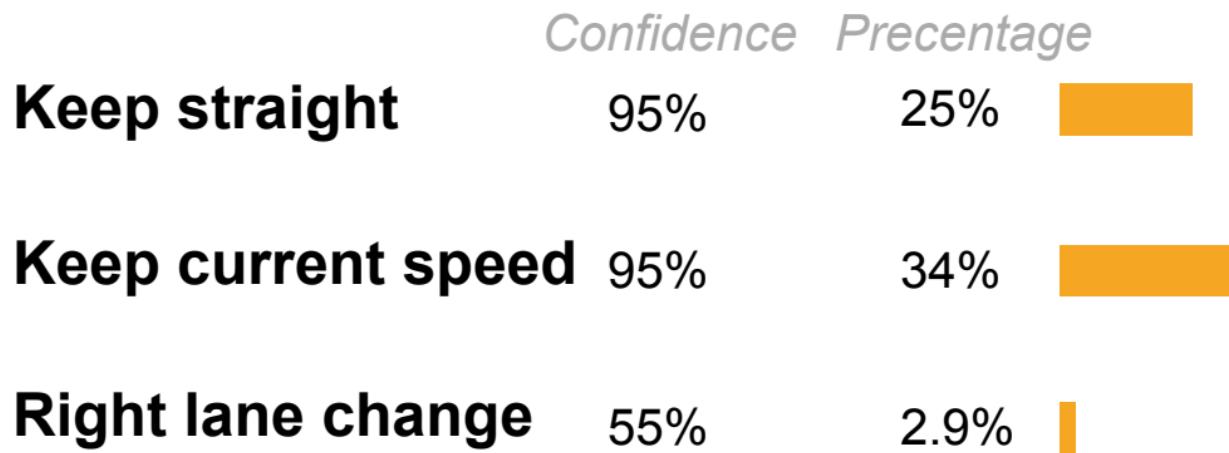
The performance of the AI house prediction tool

- Mean prediction error: $\pm 50,000$
- Max prediction error: $\pm 120,000$
- The AI tool can explain 95% of the variation in the training data

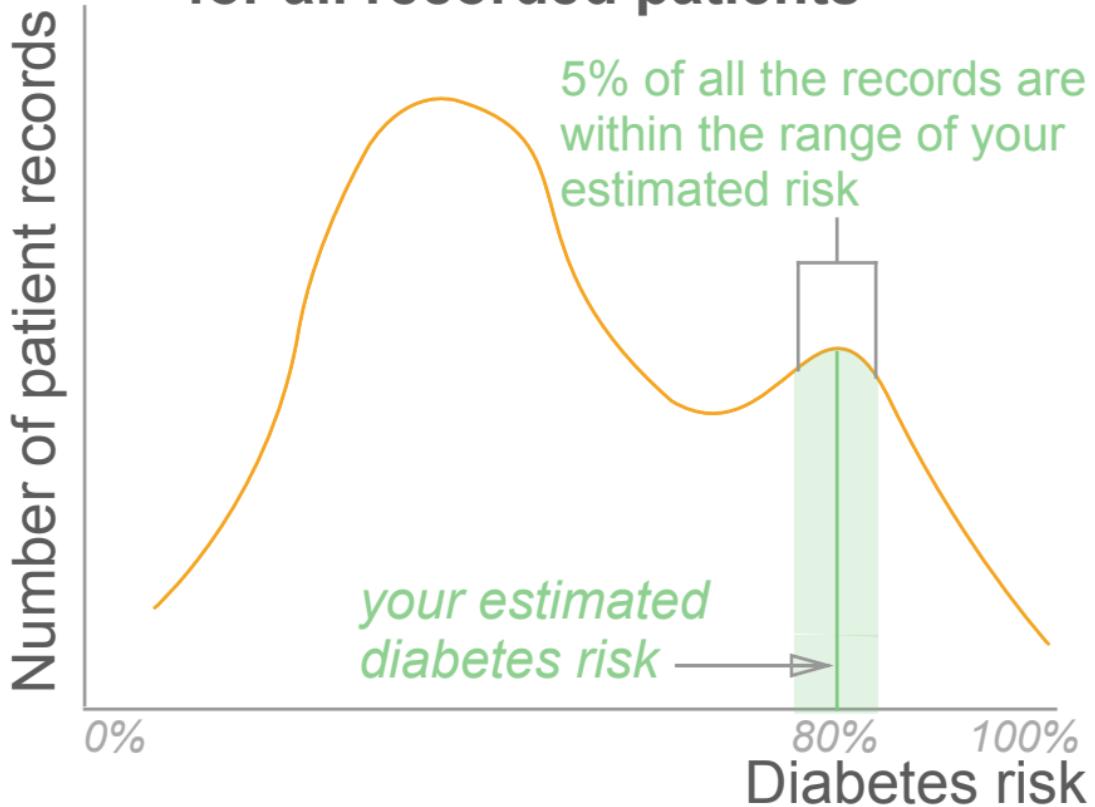
The three most likely bird according to your uploaded image, and **their percentage in the training dataset** where the AI learns from

	<i>Likelihood</i>	<i>Precentage</i>	
Indigo Bunting	95%	1.5%	
Blue Grosbeak	70%	1.2%	
Lazuli Bunting	55%	1.3%	

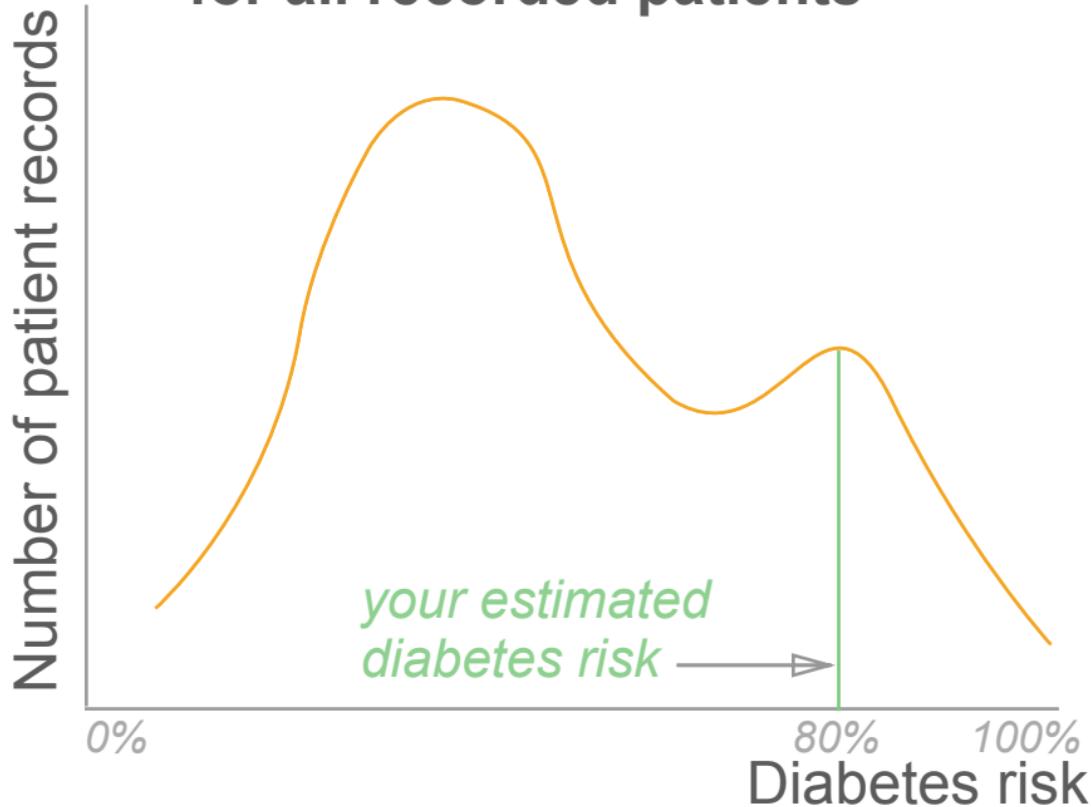
The current driving decisions, and their percentage in the training dataset where the self-driving car learns from



Distribution of predicted diabetes risk for all recorded patients



Distribution of predicted diabetes risk for all recorded patients



Distribution of house prices



Distribution of house prices



The current decisions, and their percentage in the training dataset where the AI learns from

	<i>Confidence</i>	<i>Percentage</i>	
Decision 1	95%	25%	
Decision 2	95%	34%	
Decision 3	55%	2.9%	

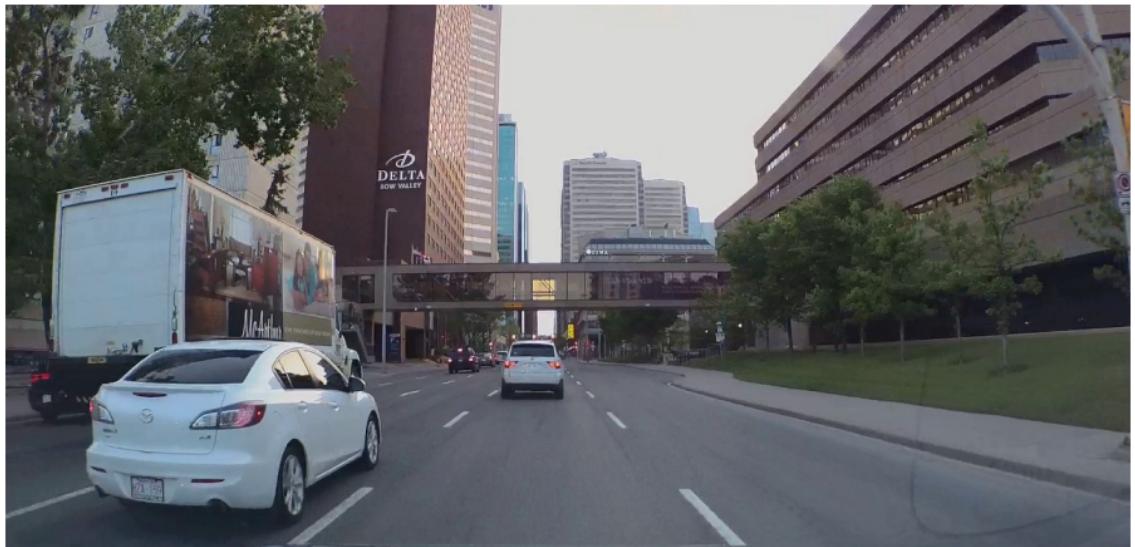
Overall performance of the AI :

- Accuracy: 85%
- Error rate: 15%

The image you uploaded:



Current traffic view:



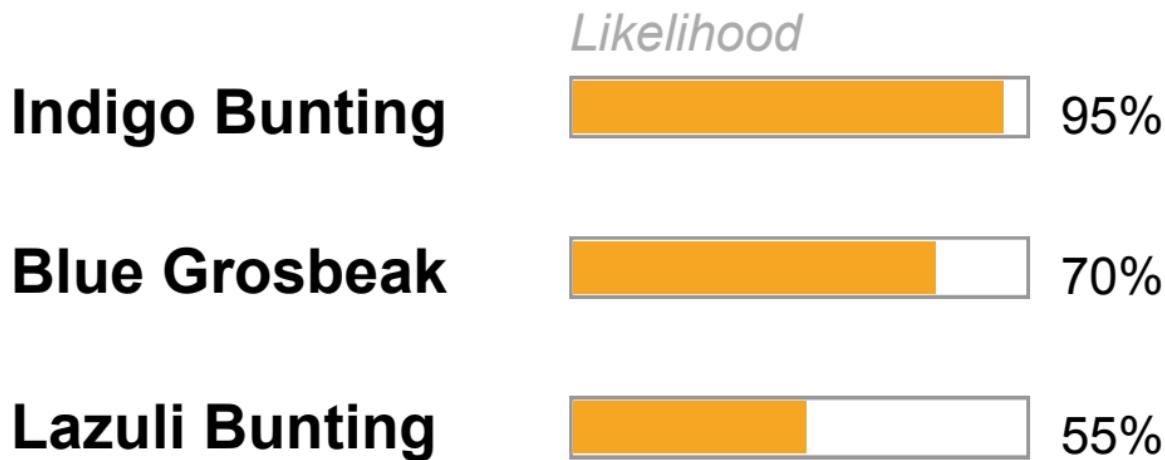
The data from your health records used for prediction:

- Male, 33 years old
- Three consecutive blood sugar level: normal, normal, higher than normal
- Body weight: 75 kg, height 175 cm
- Calories intake per day: 3200
- Minutes of exercise per week: 50 min
- Family history of diabetes:
-

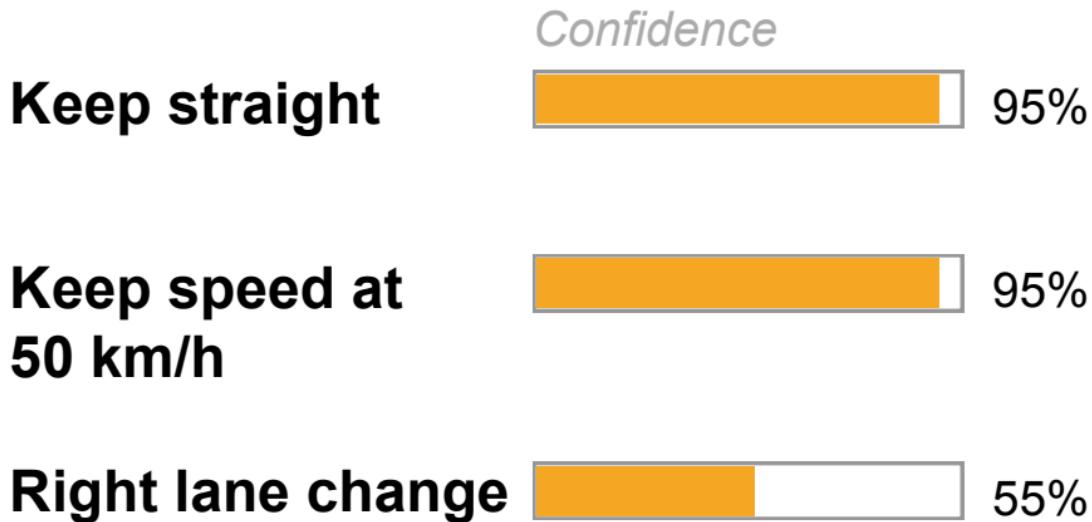
The features of your own house

- 2 bedrooms
- 1 bathroom
- 780 sq
- 20 years old
- household appliances for 10 years
- distance to school, parks: 2 km

The image you uploaded is
recognized as:



Driving decisions under the current traffic:



**Your chance of getting diabetes
within the next year is:**

80 %

**Your chance of getting diabetes
within the next year is:**

80 %

with a certainty of 90%

75 ~ 85%

with a certainty of 95%

Predicted price of your own house

\$ 650,000

Predicted price of your own house

\$ 650,000

with certainty of 90%

\$ 638 ~ 662,000

with certainty of 95%

AI's Decisions:

Confidence

Decision 1

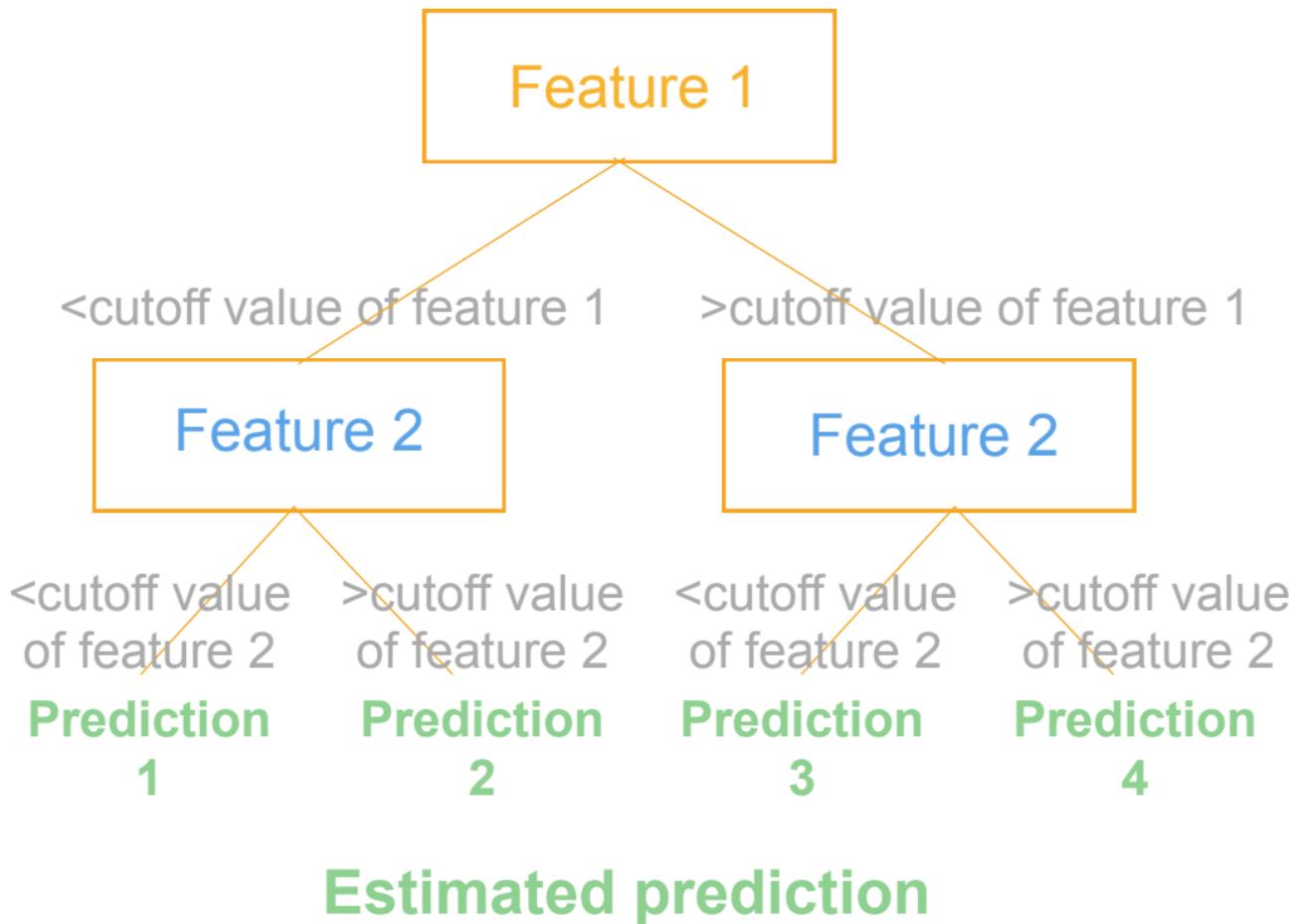


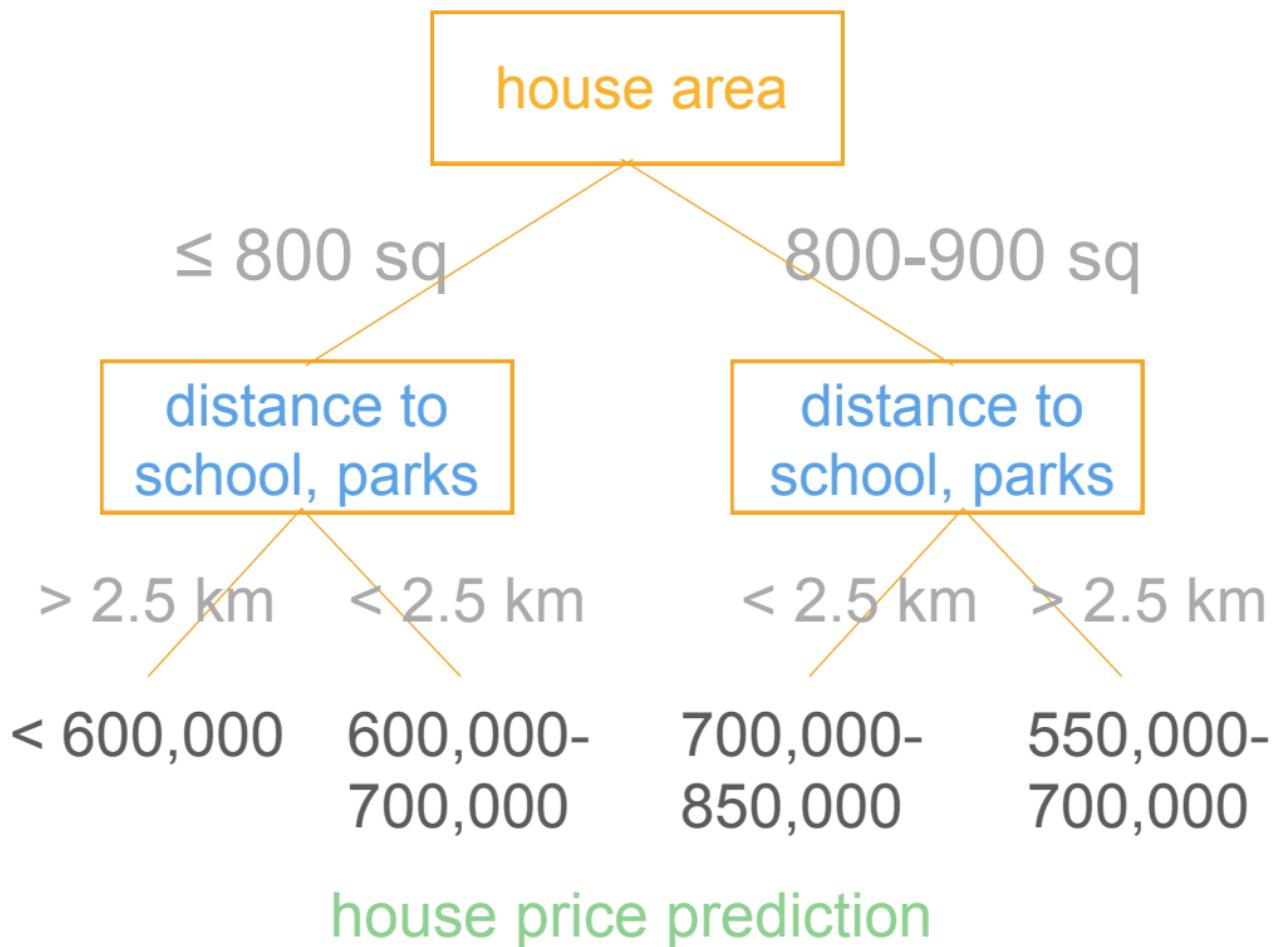
Decision 2

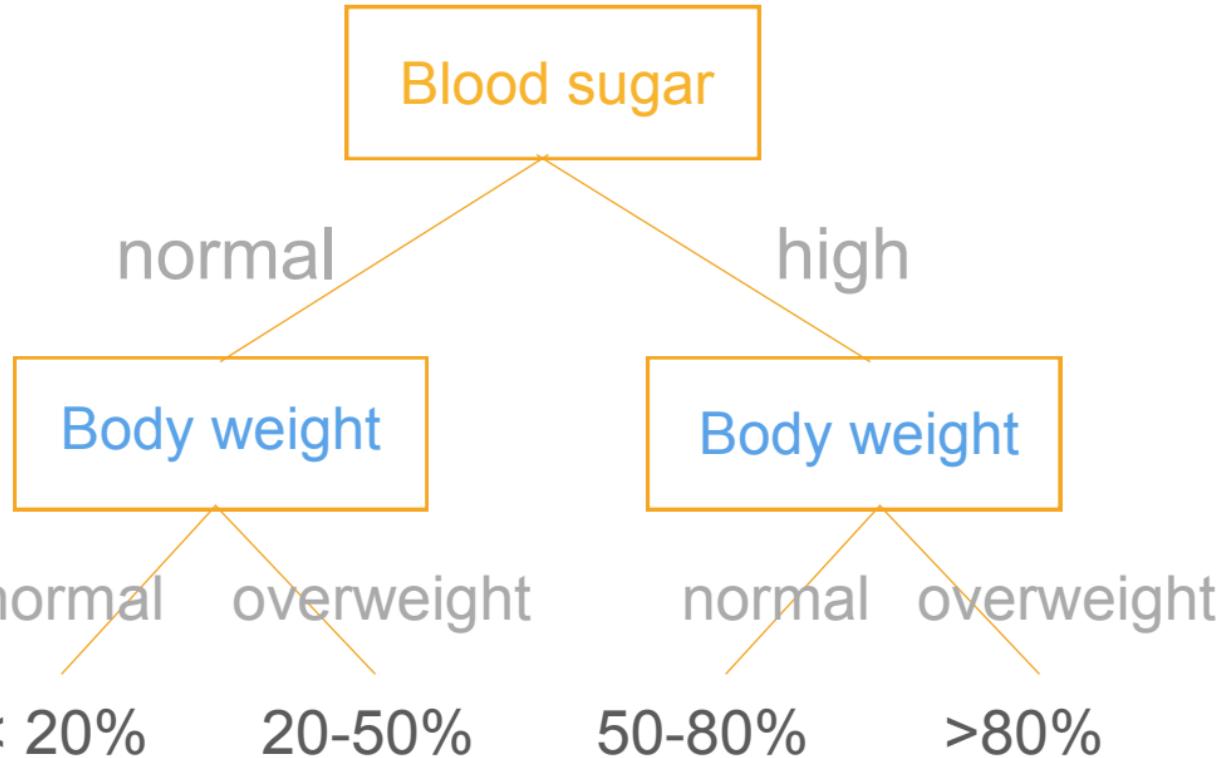


Decision 3









Estimated diabetes risk

current traffic view



Slow down
and stop



Slow down
to 30 km/h



Keep speed
at 50km/h



Slow down
to 40km/h

an uploaded image



Indigo
Bunting,
male



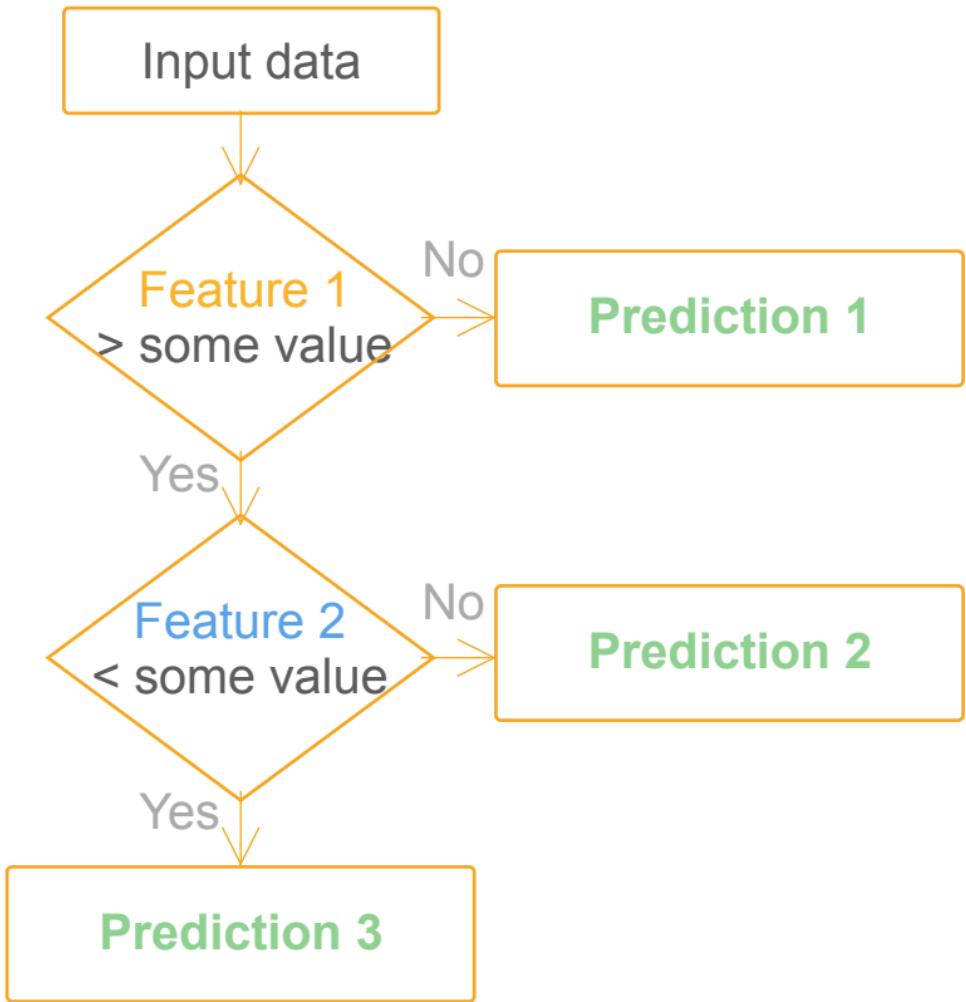
Indigo
Bunting,
female

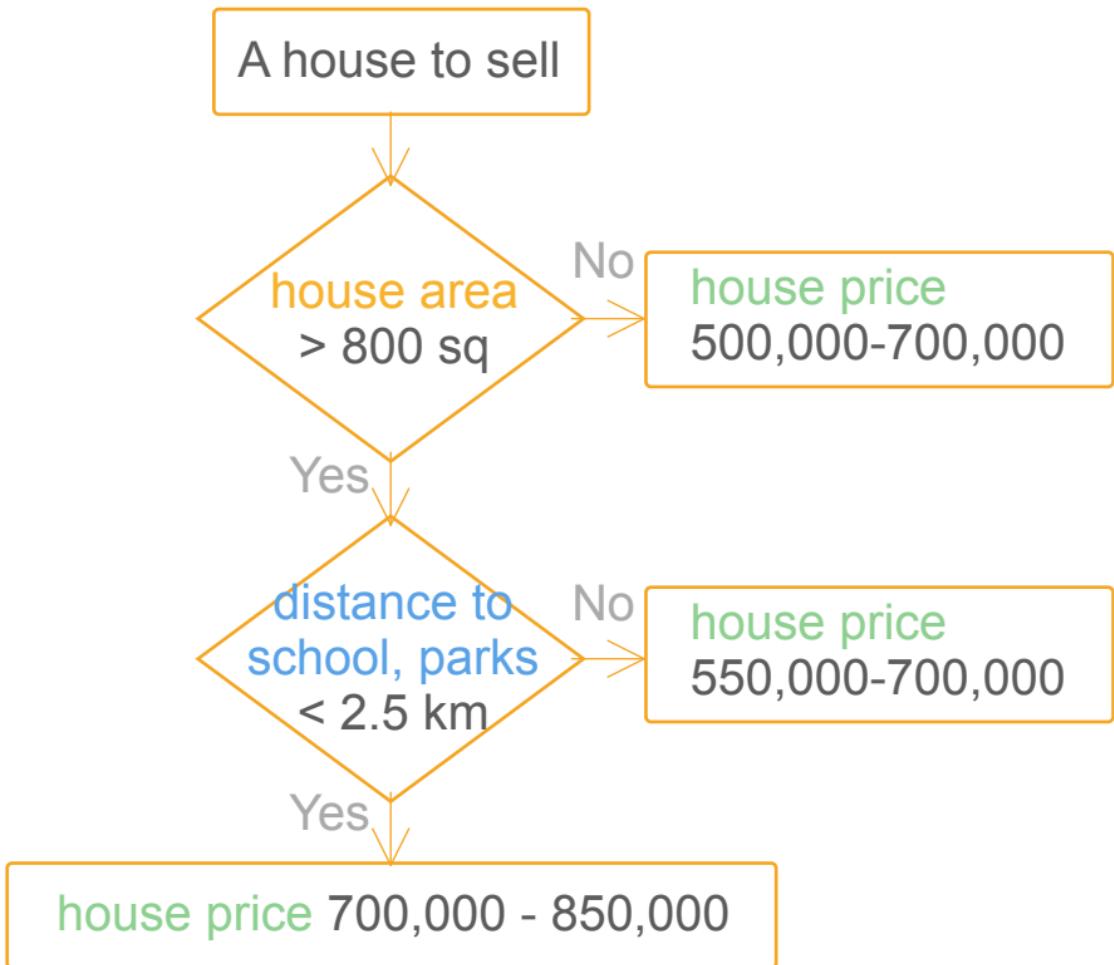


Blue
Grosbeak,
male

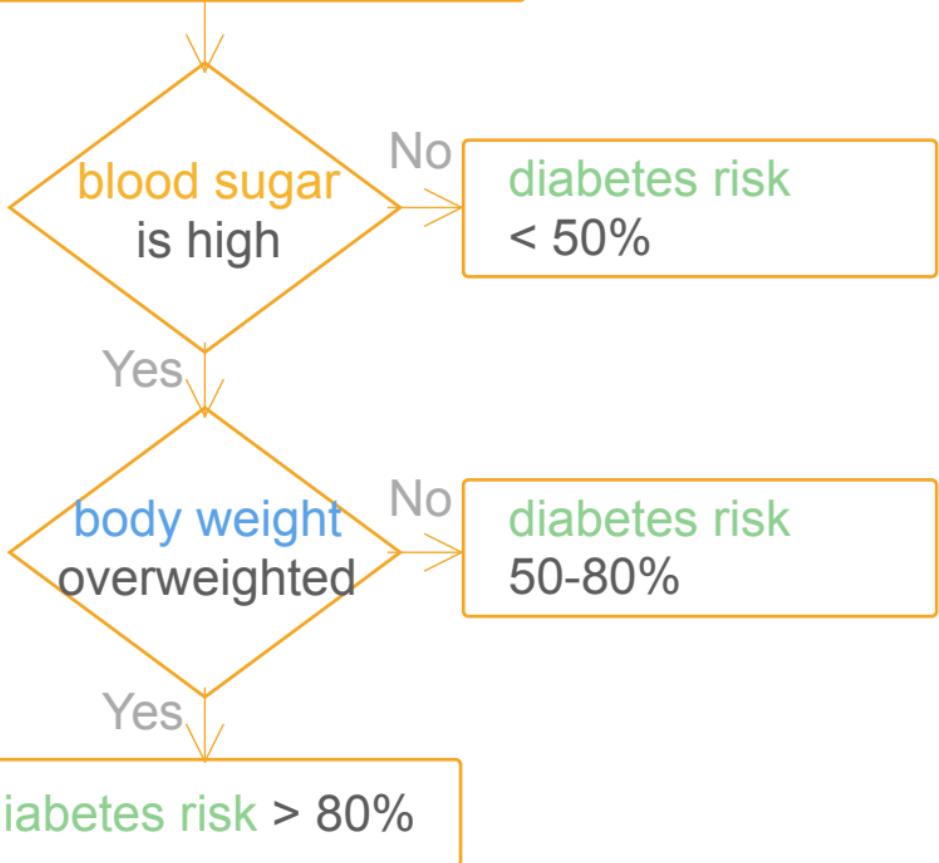


Blue
Grosbeak,
female





A patient's health record



current traffic view



detected
traffic sign

lig

detected
traffic objects

car car
rid
mot

reach driving decisions

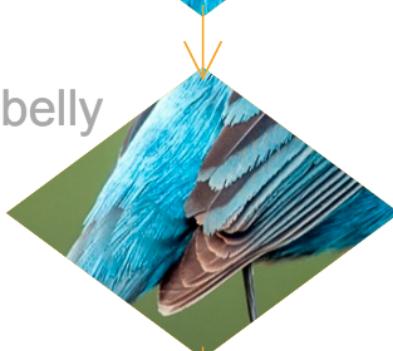
an uploaded image



looks at head



looks at belly



reach a conclusion on the bird species

If **feature 1** \leq some value,
and **feature 2** $>$ some value,
Then the prediction **is some value**

If **house area** is some value,
and **distance to school, parks** $<$ some
value,
Then the prediction **is another value**

	house area	distance to school, parks	house price prediction
Rule 1	≤ 800 sq	> 2.5 km	$< 600,000$
Rule 2	≤ 800 sq	< 2.5 km	$600,000 - 700,000$
Rule 3	$800-900$ sq	< 2.5 km	$700,000 - 850,000$

If **house area** \leq 800 sq,
and **distance to school, parks** $>$ 2.5 km,
Then house price **is no more than**
600,000

If **house area** is 800 - 900 sq,
and **distance to school, parks** $<$ 2.5 km,
Then house price **is about**
700,000-850,000

	blood sugar	body weight	diabetes risk
Rule 1	high	high	> 80%
Rule 2	high	normal	50-80%
Rule 3	normal	normal	< 20%

If **blood sugar** is high,
and **body weight** is overweighted,
Then the estimated diabetes risk
is above 80%

If **blood sugar** is normal,
and **body weight** is overweighted,
Then the estimated diabetes risk
is about 20-50%

If **traffic sign** is stop sign,
or the speed of the **car in front** are
slower,

Then the speed decision is to
slow down and stop

If **traffic sign** is 50km/h speed limit,
and the speed of the **car in front** are
the same or faster,

Then the speed is kept at
50km/h

If **bird bill** is small and thin,
and **wings and tails** are short,
Then the bird is recognized as
Indigo Bunting

If **bird bill** is big and thick,
and **wings and tails** are long,
Then the bird is recognized as
Blue Grosbeaks

The three most likely bird according to your uploaded image, and **typical examples**

**Indigo
Bunting**
95%



**Blue
Grosbeak**
70%



**Lazuli
Bunting**
55%



Typical traffic conditions to reach the self-driving car's current decision:

Keep straight
95%



Keep current speed
70%



Right lane change
55%



A typical case of the same diabetes risk as yours (80%) is like:

- Male, 45 years old
- Three consecutive blood sugar level: normal, normal, higher than normal
- Body weight: 78 kg, height 175 cm
- Calories intake per day: 3000
- Minutes of exercise per week: 30 min
- Family history of diabetes:
-

The houses of **similar price** as yours

\$539,000
202-2458 York Avenue
1 bd | 1 ba | 552 sq
Macdonald Realty

\$595,000
301-2458 York Avenue
1 bd | 1 ba | 607 sq
Macdonald Realty

Point Grey Rd

Cornwall Ave

Stephens St

York

W 1st Ave

2nd Ave

3rd Ave

Balsam St

W 2nd Ave

W 3rd Ave

Bird A highlight different regions **Bird B**



Bird A >> progressive transition >> **Bird B**



If your health data had changed to the following,
your diabetes risk would have decreased by 20%:

- 3 years younger than now
- Body weight: loss 5 kg
- Increase 50 min of weekly exercise
- Reduce 500 calories of daily calories intake
-

If the feature of your house had changed to the following feature,
your house would have increased 10% of the estimated value

- have a back yard, or
- 3 bathrooms, or
- 1200 sq, or
- less than 10 years old, or
- has new household appliances
-

If one of your input features had changed to the following value, your predicted outcome would have increased by 20%:

- Feature 1 changed to some value
- Feature 2 changed to some value
- Feature 3 changed to some value
- Feature 4 changed to some value
- Feature 5 changed to some value
- Feature 6 changed to some value
-

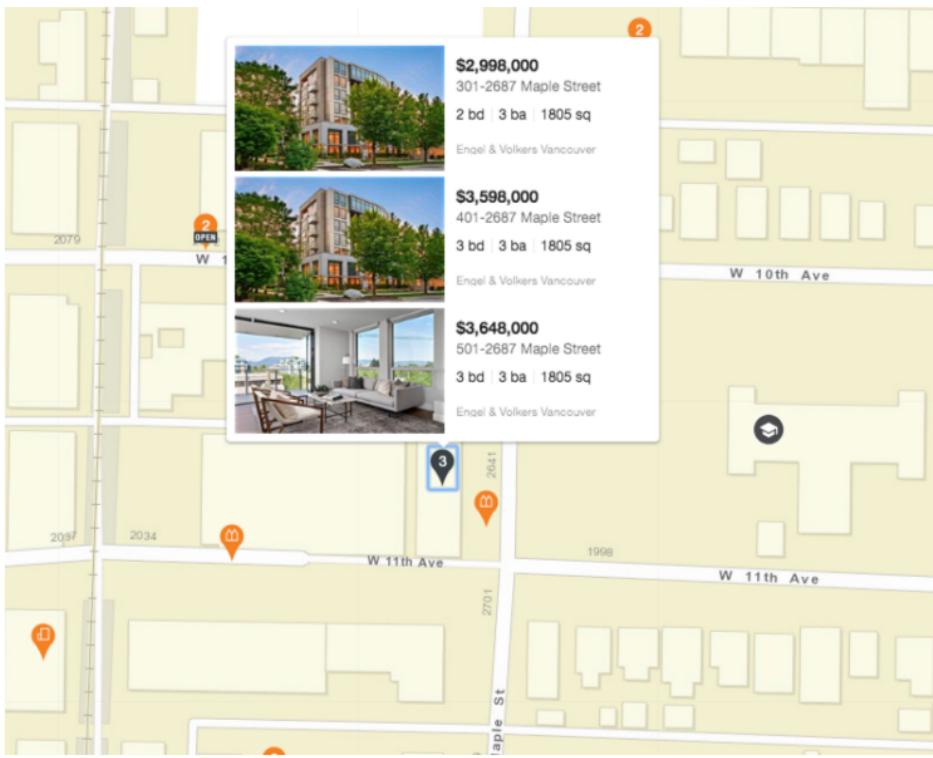
A *typical example* of the same prediction as yours (prediction value) is like:

- Feature 1
- Feature 2
- Feature 3
- Feature 4
- Feature 5
- Feature 6

A *similar example* as your input is like:

- Feature 1
 - Feature 2
 - Feature 3
 - Feature 4
 - Feature 5
 - Feature 6
-
- **Prediction:**

The houses of **similar features** as yours



A similar case as yours is like:

- Male, 35 years old
- Three consecutive blood sugar level: normal, normal, higher than normal
- Body weight: 81 kg, height 183 cm
- Calories intake per day: 3400
- Minutes of exercise per week: 60 min
- Family history of diabetes:
- **Diabetes risk: 82%**

Similar traffic conditions as the current one, from the dataset to train the self-driving car:



Similar images to the one you uploaded:



Indigo Bunting
95%



Indigo Bunting
95%



Blue Grosbeak
70%



Blue Grosbeak
70%



Lazuli Bunting
55%

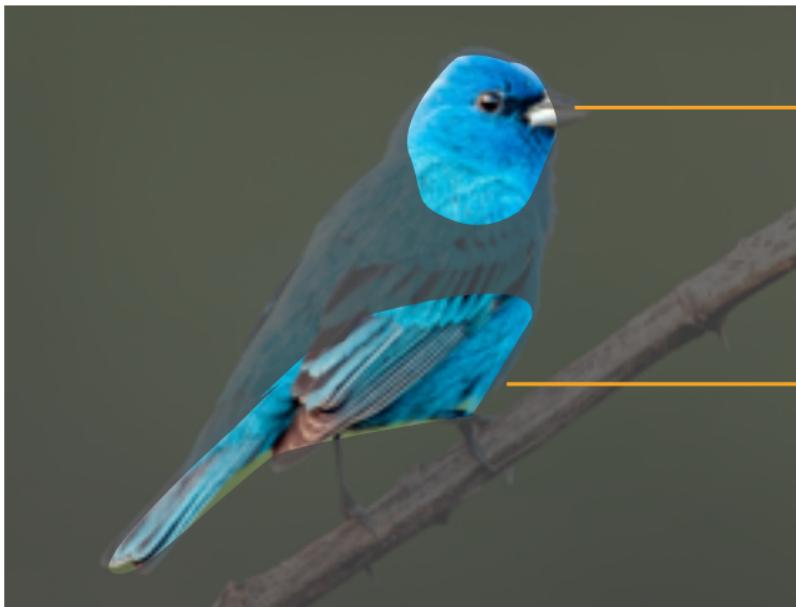


Painted Bunting
45%

Important regions (highlighted)
for AI's bird recognition:



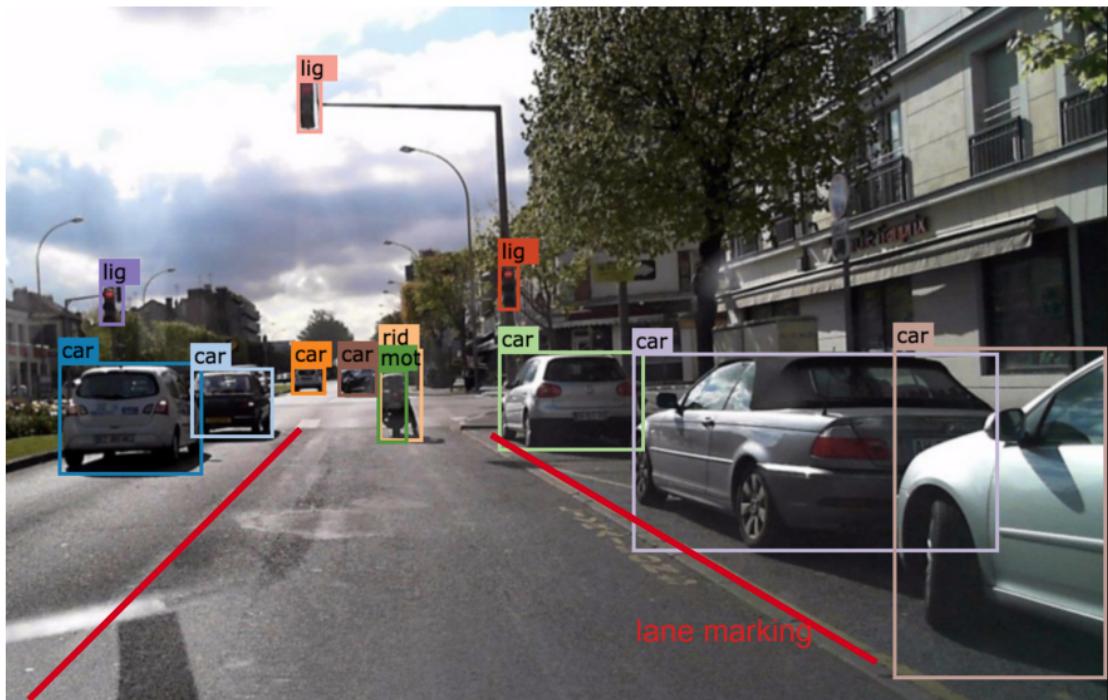
Important regions (highlighted) for AI's bird recognition:



contribute
30% of the
overall
decision

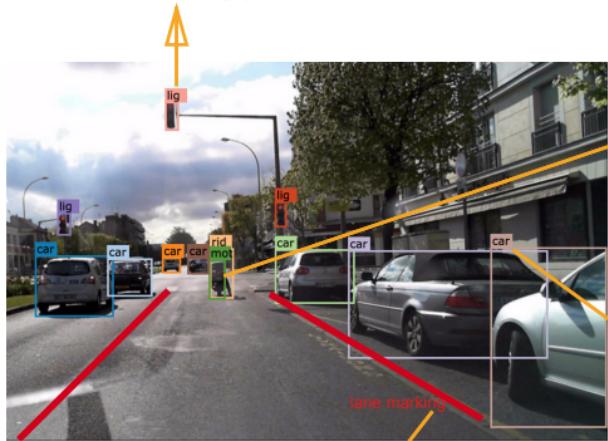
contribute
20% of the
overall
decision

Important objects detected for the self-driving car's judgement:



Important objects detected for the self-driving car's judgement:

contribute **65%** of the **slow down & stop** decision

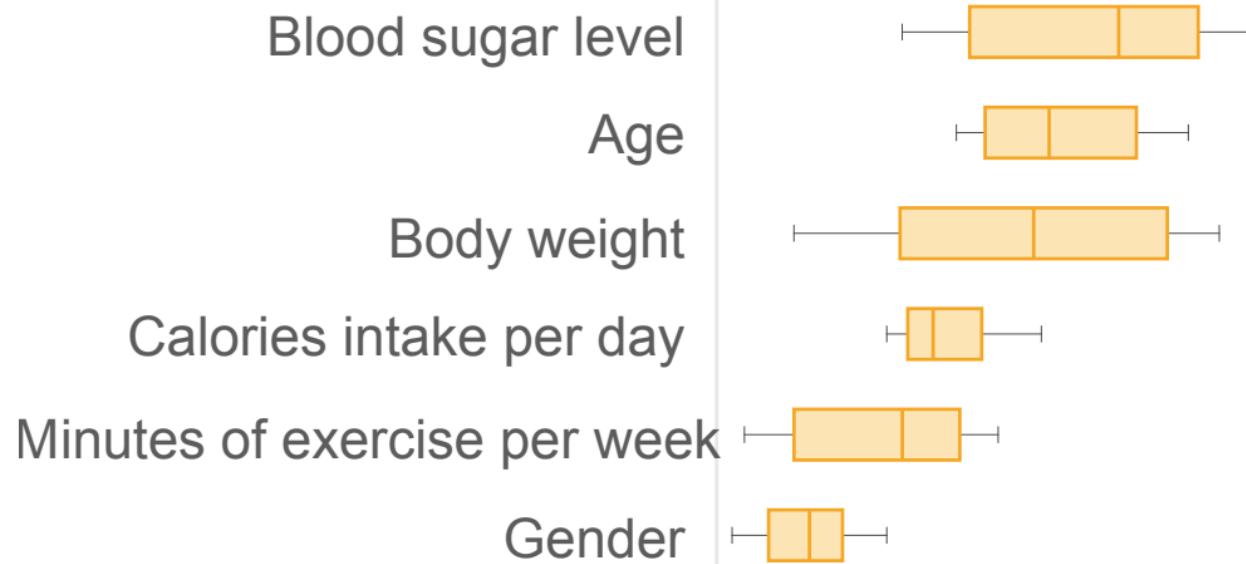


contribute **30%** of the
slow down & stop
decision

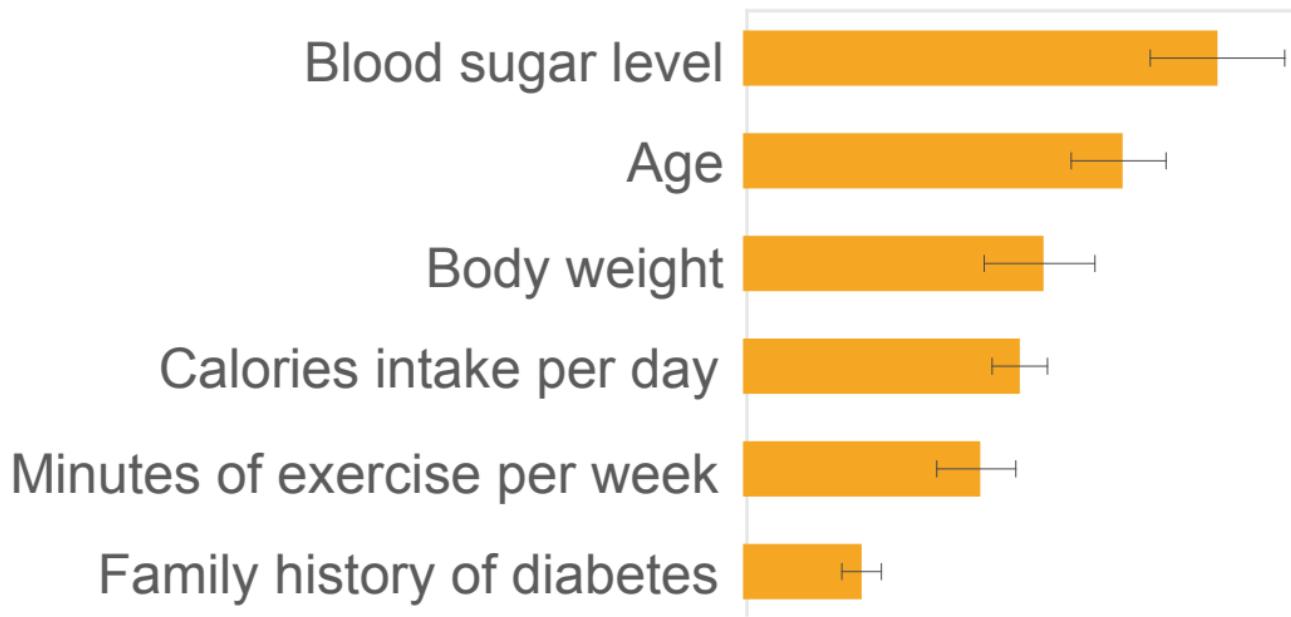
contribute **20%** of the
keep current lane
decision

contribute **48%** of the
keep current lane decision

Feature importance score

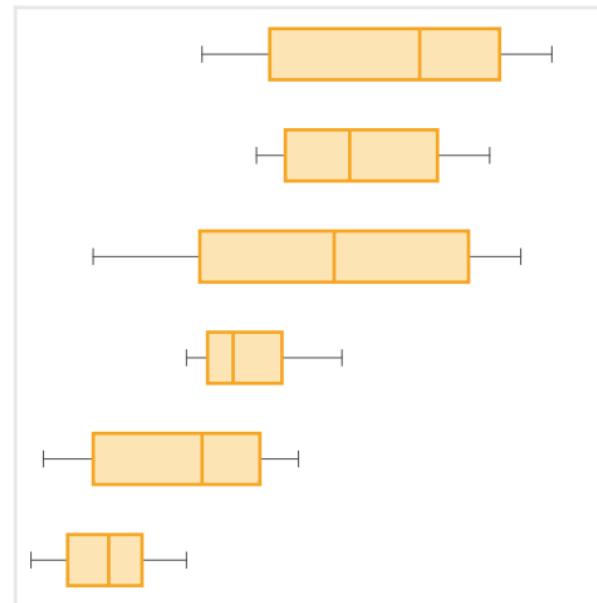


How important is each feature to the result:

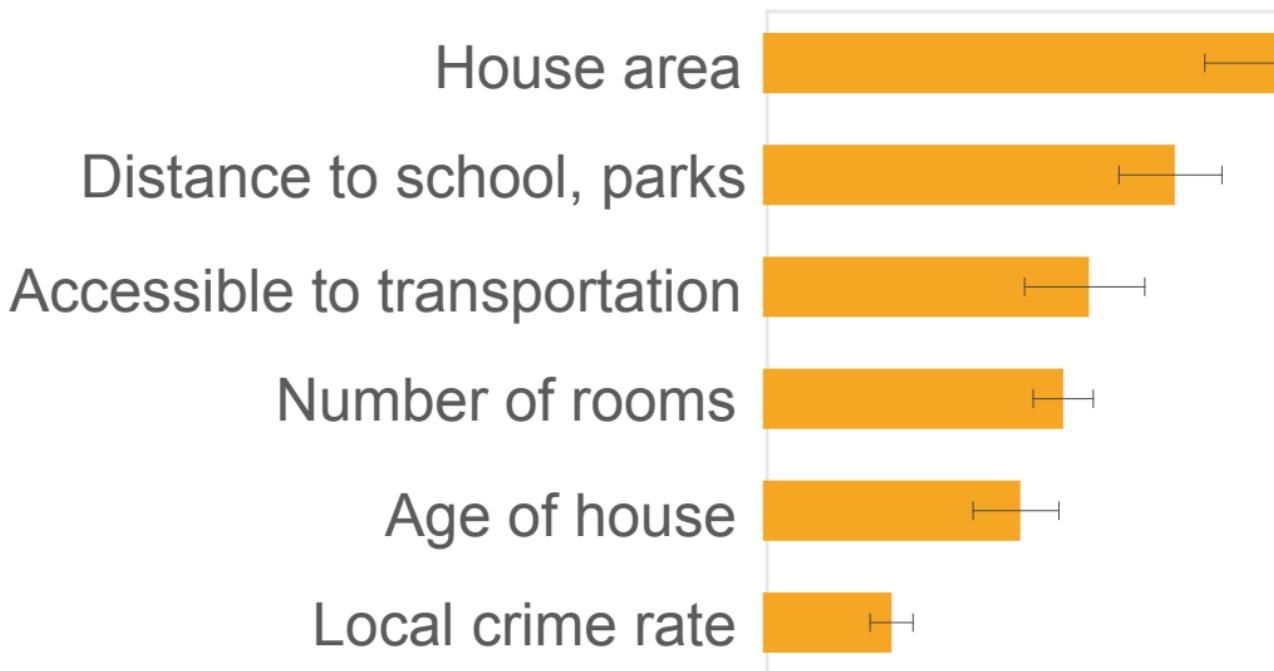


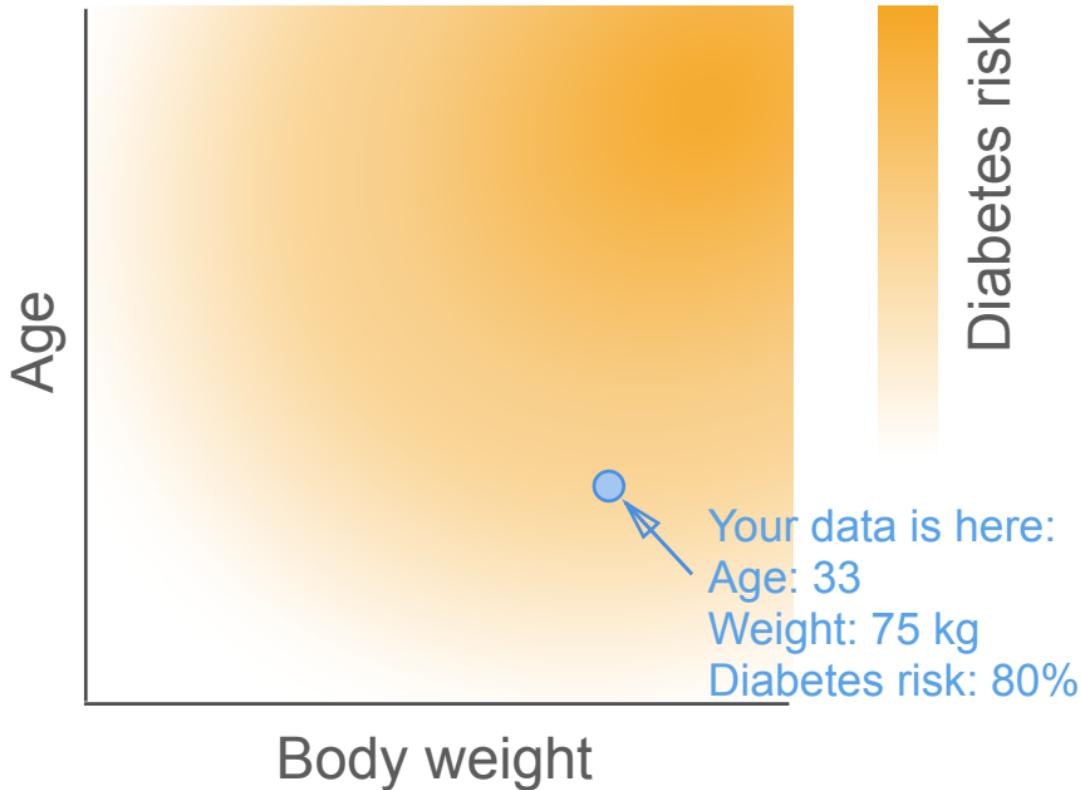
Feature importance score

House area
Distance to school, parks
Accessible to transportation
Number of rooms
Age of house
Local crime rate



How important is each feature to the result:



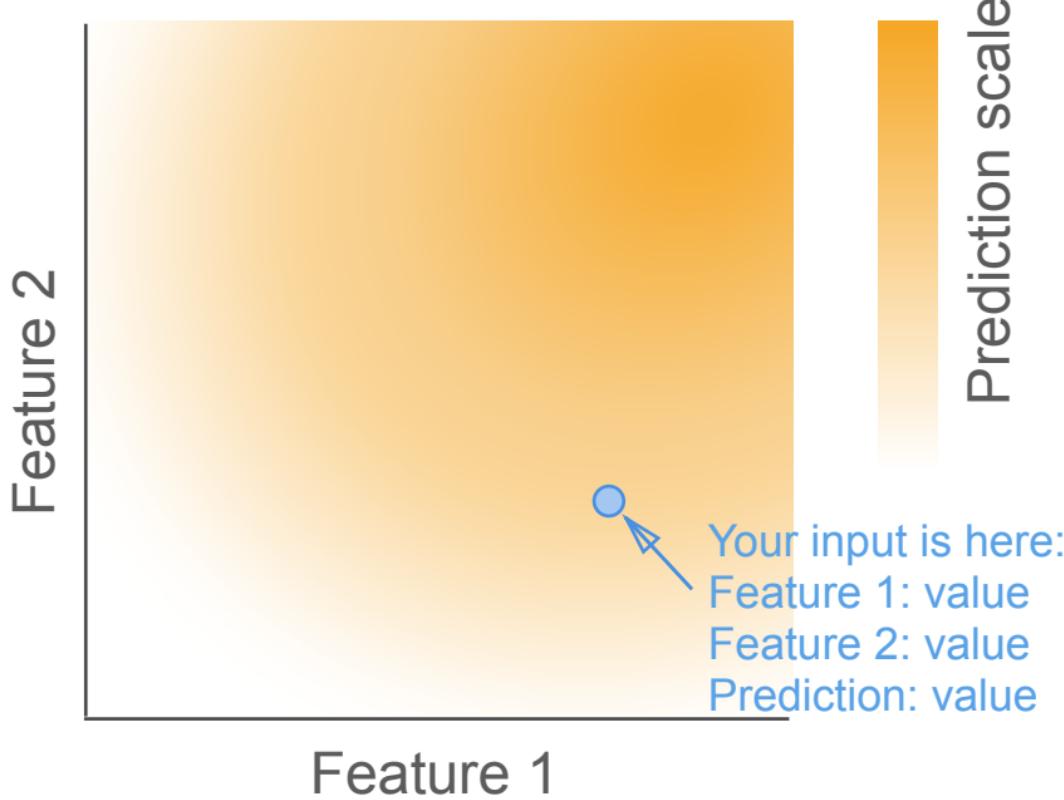


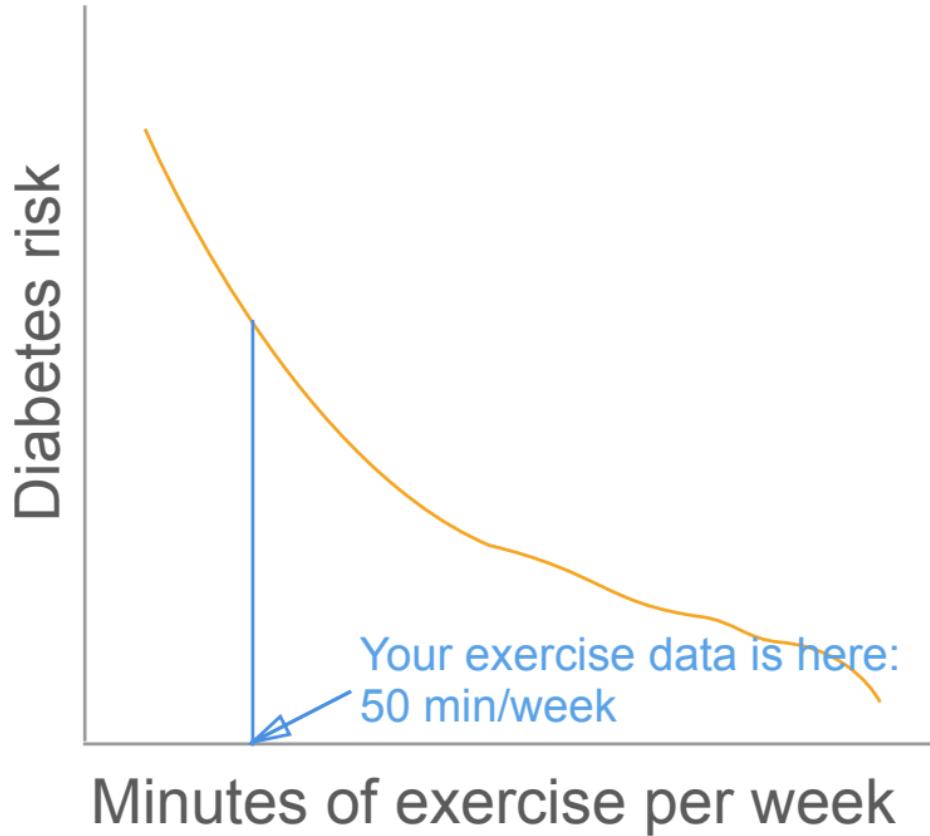
Number of rooms

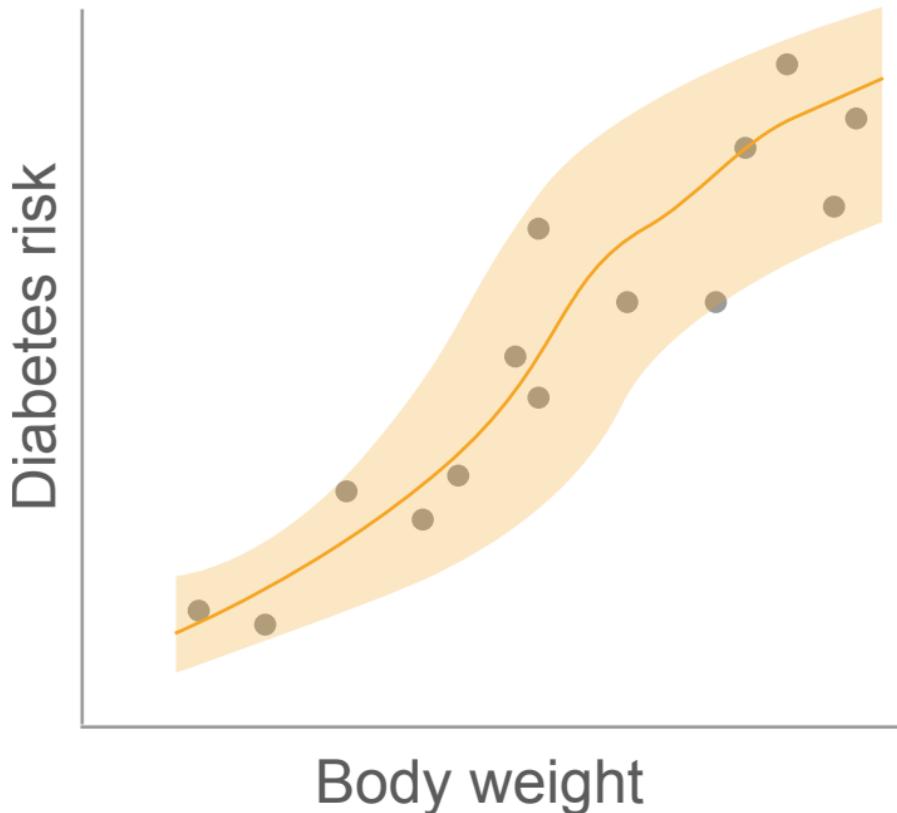
House area

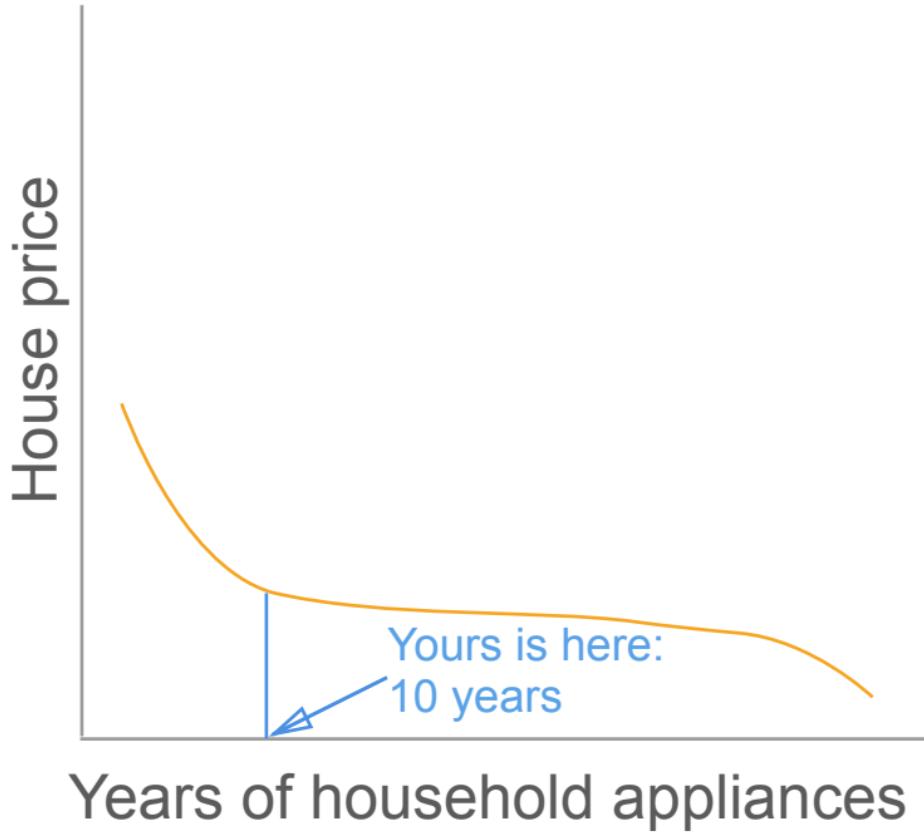


Your house is here:
Area: 780 sq
Rooms: 3
Price: 650,000





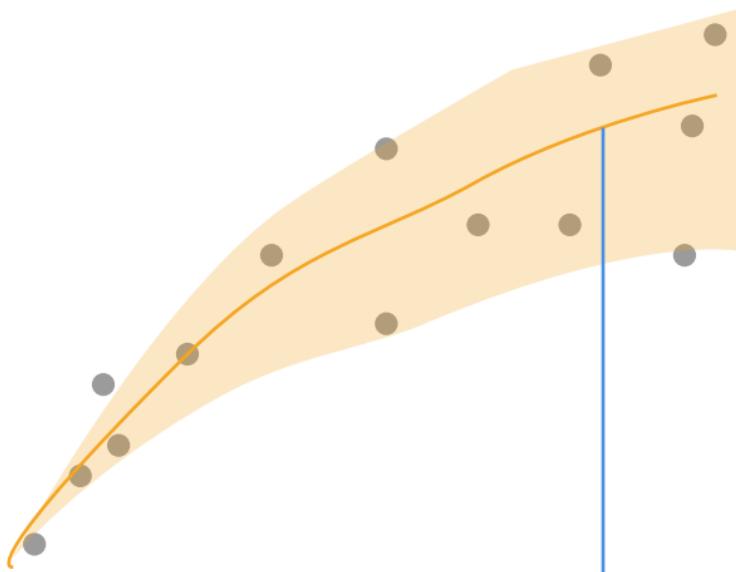




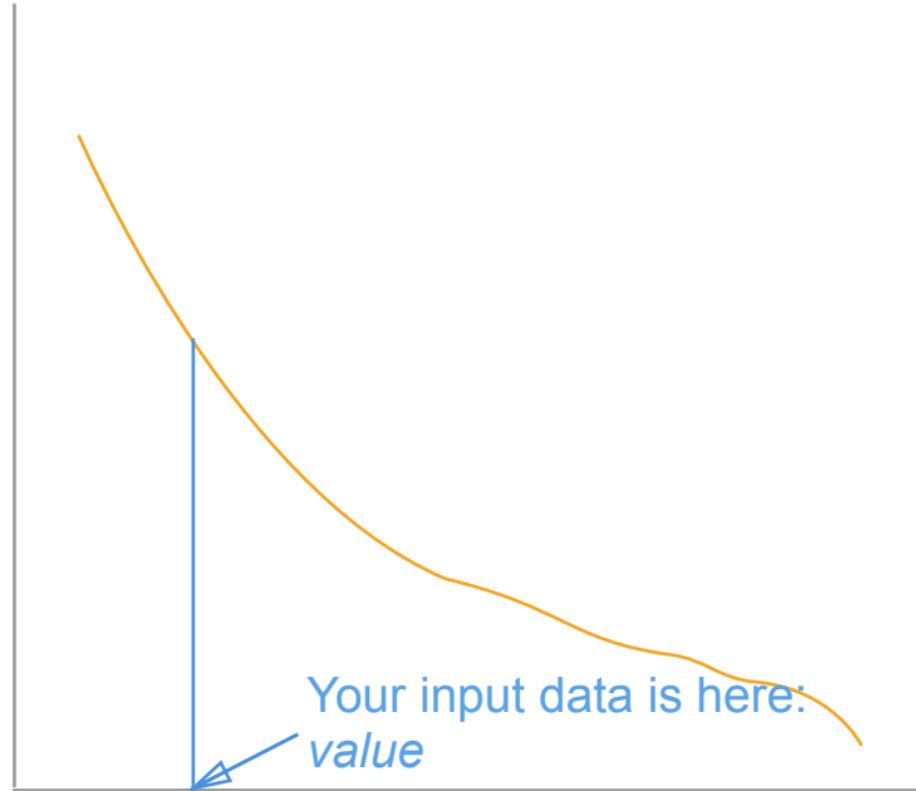
House price

House area

↑ Your house is here:
780 sq

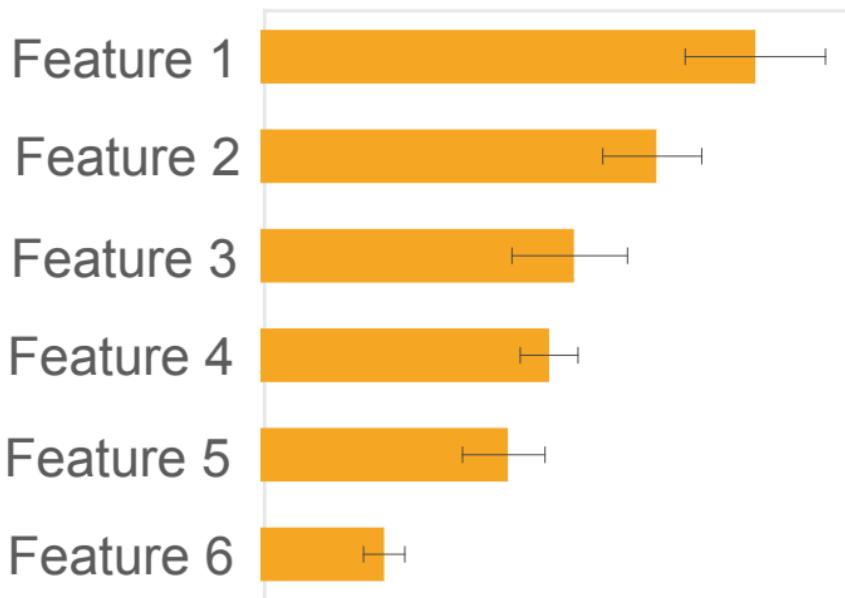


Prediction



Feature 1

How important is each feature to the result:



The features of your current input:

- Feature 1
- Feature 2
- Feature 3
-

Rule

Decision tree

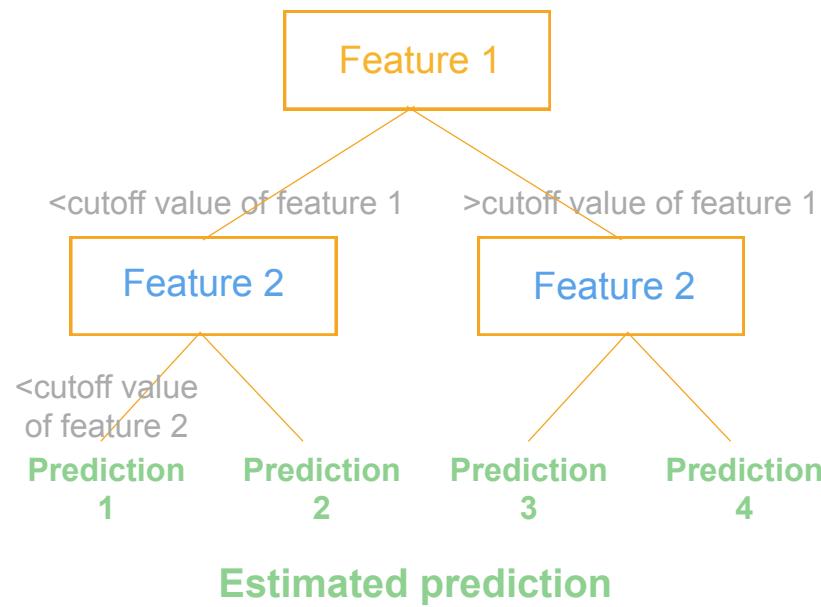
Decision flow

Rule

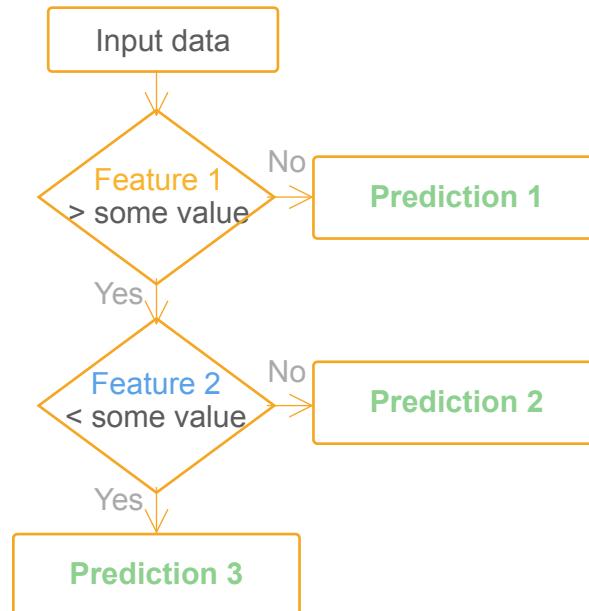
If **feature 1** \leq some value,
and **feature 2** $>$ some value,
Then the prediction **is some value**

If **house area** is some value,
and **distance to school, parks** $<$ some
value,
Then the prediction **is another value**

Decision tree



Decision flow



Similar example

Typical example

Counterfactual example

Similar example

A ***similar example*** as your input is like:

- Feature 1
- Feature 2
- Feature 3
- Feature 4
- Feature 5
- Feature 6
- **Prediction:**

Typical example

A ***typical example*** of the same prediction as yours (prediction value) is like:

- Feature 1
- Feature 2
- Feature 3
- Feature 4
- Feature 5
- Feature 6

Counterfactual example

If one of your input features had changed to the following value, your predicted outcome would have increased by 20%:

- Feature 1 changed to some value
- Feature 2 changed to some value
- Feature 3 changed to some value
- Feature 4 changed to some value
- Feature 5 changed to some value
- Feature 6 changed to some value
-

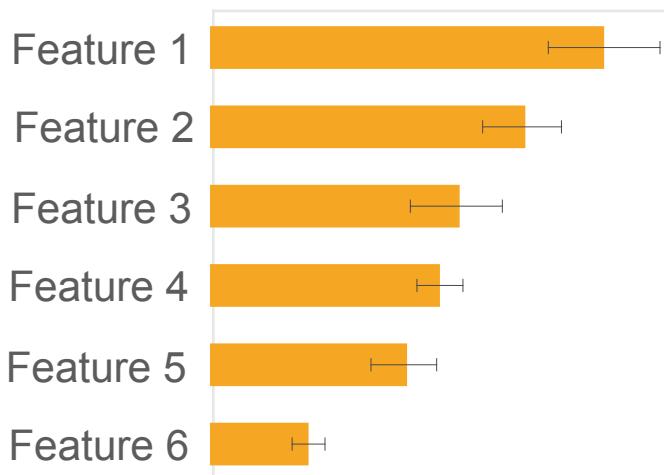
Feature attribute

Feature shape

Feature interaction

Feature attribute

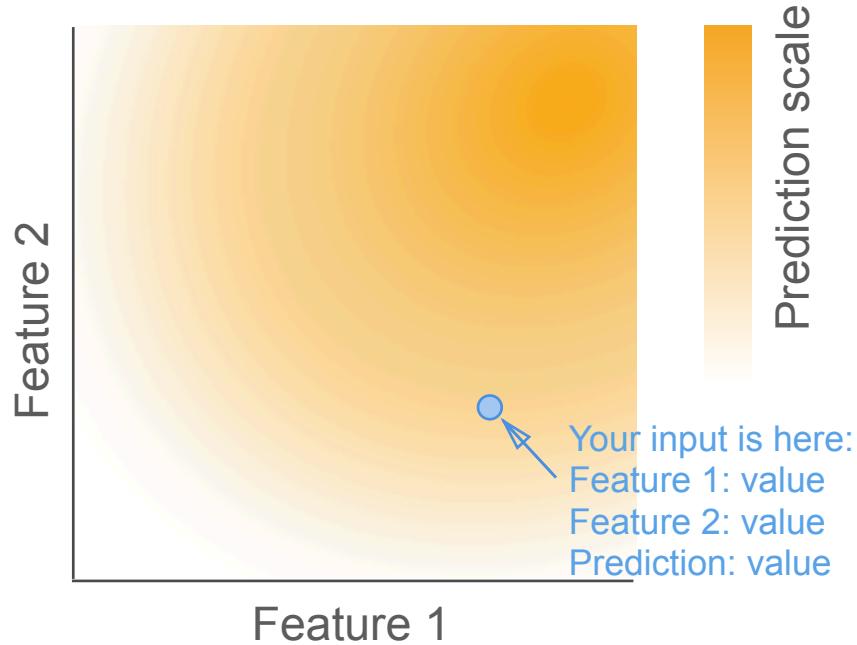
How important is each feature to the result:



Feature shape



Feature interaction



Input

Output

Performance

Dataset

Input

The features of your current input:

- Feature 1
- Feature 2
- Feature 3
-

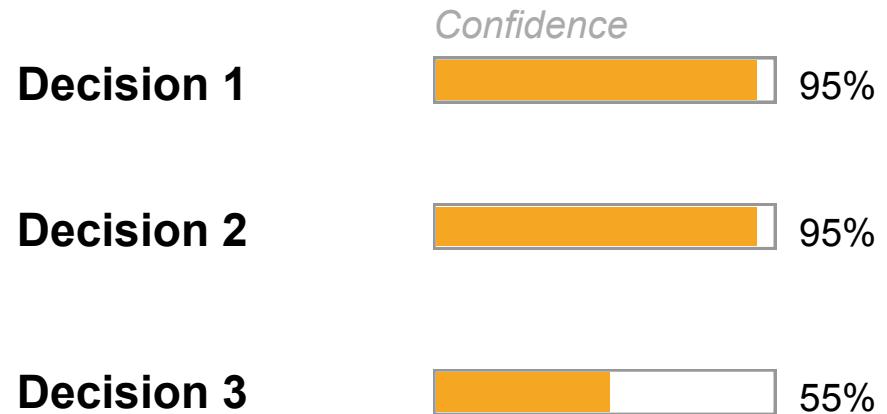
Performance

Overall performance of the AI :

- Accuracy: 85%
- Error rate: 15%

Output

AI's Decisions:



Dataset

The current decisions, and their percentage in the training dataset where the AI learns from

	<i>Confidence</i>	<i>Percentage</i>	
Decision 1	95%	25%	
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Decision 3	55%	2.9%	