

Car guessing game



Prompt: This is a car attributes dataset. I have a hidden car in mind. You are allowed to ask me binary questions about the hidden car's attributes, for you to figure out the hidden car. After receiving an answer, at each step, you must print what your current belief distribution is, about the possible hidden car.

```
cars = {
  "Ford Maverick": {
    "sedan": False,
    "suv": False,
    "truck": True,
    "coupe": False,
    "convertible": False,
    "electric": False,
    "hybrid": True,
    "gas": False,
    "luxury": False,
    "sports": False,
    "off_road": False,
    "all_wheel_drive": False,
    "front_wheel_drive": True,
    "rear_wheel_drive": False,
    "domestic": True,
    "seats_2": False,
    "seats_4": False,
    "seats_5": True,
    "seats_7plus": False,
    "expensive": False
  },

  "Mini Cooper": {
    "sedan": False,
    "suv": False,
    "truck": False,
    "coupe": True,
    "convertible": False,
    "electric": False,
    "hybrid": False,
    "gas": True,
    "luxury": False,
    "sports": False,
    "off_road": False,
    "all_wheel_drive": False,
    "front_wheel_drive": True,
    "rear_wheel_drive": False,
```

```
"domestic": False,
"seats_2": False,
"seats_4": True,
"seats_5": False,
"seats_7plus": False,
"expensive": False
},
```

```
"BMW 3 Series": {
  "sedan": True,
  "suv": False,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": True,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": False,
  "front_wheel_drive": False,
  "rear_wheel_drive": True,
  "domestic": False,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": False,
  "expensive": False
},
```

```
"Jaguar F-Type": {
  "sedan": False,
  "suv": False,
  "truck": False,
  "coupe": True,
  "convertible": False,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": True,
  "sports": True,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": True,
  "domestic": False,
  "seats_2": True,
  "seats_4": False,
  "seats_5": False,
  "seats_7plus": False,
```

```

    "expensive": False
  },

  "Dodge Charger": {
    "sedan": True,
    "suv": False,
    "truck": False,
    "coupe": False,
    "convertible": False,
    "electric": False,
    "hybrid": False,
    "gas": True,
    "luxury": False,
    "sports": True,
    "off_road": False,
    "all_wheel_drive": True,
    "front_wheel_drive": False,
    "rear_wheel_drive": True,
    "domestic": True,
    "seats_2": False,
    "seats_4": False,
    "seats_5": True,
    "seats_7plus": False,
    "expensive": False
  },

  "Acura NSX": {
    "sedan": False,
    "suv": False,
    "truck": False,
    "coupe": True,
    "convertible": False,
    "electric": False,
    "hybrid": True,
    "gas": False,
    "luxury": True,
    "sports": True,
    "off_road": False,
    "all_wheel_drive": True,
    "front_wheel_drive": False,
    "rear_wheel_drive": False,
    "domestic": False,
    "seats_2": True,
    "seats_4": False,
    "seats_5": False,
    "seats_7plus": False,
    "expensive": True
  },

  "Lexus LC 500": {
    "sedan": False,

```

```
"suv": False,
"truck": False,
"coupe": True,
"convertible": True,
"electric": False,
"hybrid": False,
"gas": True,
"luxury": True,
"sports": True,
"off_road": False,
"all_wheel_drive": False,
"front_wheel_drive": False,
"rear_wheel_drive": True,
"domestic": False,
"seats_2": False,
"seats_4": True,
"seats_5": False,
"seats_7plus": False,
"expensive": True
},
```

```
"Audi R8": {
  "sedan": False,
  "suv": False,
  "truck": False,
  "coupe": True,
  "convertible": True,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": True,
  "sports": True,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": False,
  "seats_2": True,
  "seats_4": False,
  "seats_5": False,
  "seats_7plus": False,
  "expensive": True
},
```

```
"Chevrolet Tahoe": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
```

```
"hybrid": False,
"gas": True,
"luxury": True,
"sports": False,
"off_road": True,
"all_wheel_drive": True,
"front_wheel_drive": False,
"rear_wheel_drive": False,
"domestic": True,
"seats_2": False,
"seats_4": False,
"seats_5": False,
"seats_7plus": True,
"expensive": False
},
```

```
"Kia Carnival": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": False,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": False,
  "front_wheel_drive": True,
  "rear_wheel_drive": False,
  "domestic": False,
  "seats_2": False,
  "seats_4": False,
  "seats_5": False,
  "seats_7plus": True,
  "expensive": False
},
```

```
"Chevrolet Corvette": {
  "sedan": False,
  "suv": False,
  "truck": False,
  "coupe": True,
  "convertible": False,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": False,
  "sports": True,
  "off_road": False,
```

```
"all_wheel_drive": False,
"front_wheel_drive": False,
"rear_wheel_drive": True,
"domestic": True,
"seats_2": True,
"seats_4": False,
"seats_5": False,
"seats_7plus": False,
"expensive": False
},
```

```
"Toyota Prius": {
  "sedan": True,
  "suv": False,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": True,
  "gas": False,
  "luxury": False,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": False,
  "front_wheel_drive": True,
  "rear_wheel_drive": False,
  "domestic": False,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": False,
  "expensive": False
},
```

```
"Rivian R1T": {
  "sedan": False,
  "suv": False,
  "truck": True,
  "coupe": False,
  "convertible": False,
  "electric": True,
  "hybrid": False,
  "gas": False,
  "luxury": True,
  "sports": False,
  "off_road": True,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": True,
  "seats_2": False,
```

```

"seats_4": False,
"seats_5": True,
"seats_7plus": False,
"expensive": True
},

"Tesla Model Y": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": True,
  "hybrid": False,
  "gas": False,
  "luxury": True,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": True,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": True,
  "expensive": True
},

"Jeep Wrangler": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": True,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": False,
  "sports": False,
  "off_road": True,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": True,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": False,
  "expensive": False
},

```

```
"McLaren Artura": {  
  "sedan": False,  
  "suv": False,  
  "truck": False,  
  "coupe": True,  
  "convertible": False,  
  "electric": False,  
  "hybrid": True,  
  "gas": False,  
  "luxury": True,  
  "sports": True,  
  "off_road": False,  
  "all_wheel_drive": False,  
  "front_wheel_drive": False,  
  "rear_wheel_drive": True,  
  "domestic": False,  
  "seats_2": True,  
  "seats_4": False,  
  "seats_5": False,  
  "seats_7plus": False,  
  "expensive": True  
},
```

```
"Toyota Sienna": {  
  "sedan": False,  
  "suv": False,  
  "truck": False,  
  "coupe": False,  
  "convertible": False,  
  "electric": False,  
  "hybrid": True,  
  "gas": False,  
  "luxury": False,  
  "sports": False,  
  "off_road": True,  
  "all_wheel_drive": True,  
  "front_wheel_drive": False,  
  "rear_wheel_drive": False,  
  "domestic": False,  
  "seats_2": False,  
  "seats_4": False,  
  "seats_5": False,  
  "seats_7plus": True,  
  "expensive": False  
},
```

```
"Lexus RX": {  
  "sedan": False,  
  "suv": True,  
  "truck": False,
```



```
"coupe": False,
"convertible": False,
"electric": False,
"hybrid": True,
"gas": False,
"luxury": True,
"sports": False,
"off_road": False,
"all_wheel_drive": True,
"front_wheel_drive": False,
"rear_wheel_drive": False,
"domestic": False,
"seats_2": False,
"seats_4": False,
"seats_5": True,
"seats_7plus": True,
"expensive": False
},
```

```
"Volvo XC90": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": True,
  "gas": False,
  "luxury": True,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": False,
  "seats_2": False,
  "seats_4": False,
  "seats_5": False,
  "seats_7plus": True,
  "expensive": False
},
```

```
"Genesis GV80": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": False,
  "gas": True,
```

```
"luxury": True,
"sports": False,
"off_road": False,
"all_wheel_drive": True,
"front_wheel_drive": False,
"rear_wheel_drive": True,
"domestic": False,
"seats_2": False,
"seats_4": False,
"seats_5": False,
"seats_7plus": True,
"expensive": False
},
```

```
"Lucid Air": {
  "sedan": True,
  "suv": False,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": True,
  "hybrid": False,
  "gas": False,
  "luxury": True,
  "sports": True,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": True,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": False,
  "expensive": True
},
```

```
"Hyundai Ioniq 6": {
  "sedan": True,
  "suv": False,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": True,
  "hybrid": False,
  "gas": False,
  "luxury": False,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
```

```
"rear_wheel_drive": False,
"domestic": False,
"seats_2": False,
"seats_4": False,
"seats_5": True,
"seats_7plus": False,
"expensive": False
},
```

```
"Jeep Grand Cherokee": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": True,
  "gas": False,
  "luxury": False,
  "sports": False,
  "off_road": True,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": True,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": False,
  "expensive": False
},
```

```
"BMW X5": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": True,
  "gas": False,
  "luxury": True,
  "sports": False,
  "off_road": False,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": False,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
```

```

"seats_7plus": False,
"expensive": False
},

"Subaru Forester Wilderness": {
  "sedan": False,
  "suv": True,
  "truck": False,
  "coupe": False,
  "convertible": False,
  "electric": False,
  "hybrid": False,
  "gas": True,
  "luxury": False,
  "sports": False,
  "off_road": True,
  "all_wheel_drive": True,
  "front_wheel_drive": False,
  "rear_wheel_drive": False,
  "domestic": False,
  "seats_2": False,
  "seats_4": False,
  "seats_5": True,
  "seats_7plus": False,
  "expensive": False
}
}

```

Great! I'll try to guess your hidden car by asking yes-or-no questions about its attributes. After each answer, I'll update and show my belief distribution over all possible cars.

Let's start with a high-information attribute.

Question 1: Is the hidden car **electric**?



No.

Thanks! That eliminates all electric cars.

Electric Cars Eliminated:

- Rivian R1T
- Tesla Model Y
- Lucid Air
- Hyundai Ioniq 6

Remaining cars: 24

Here is the **current belief distribution** (uniform over remaining cars):

```
sql
```

Each remaining car: 1 / 24 \approx 4.17%

- Acura NSX
- Audi R8
- BMW 3 Series
- BMW X5
- Chevrolet Corvette
- Chevrolet Tahoe
- Dodge Charger
- Ford Maverick
- Genesis GV80
- Jaguar F-Type
- Jeep Grand Cherokee
- Jeep Wrangler
- Kia Carnival
- Lexus LC 500
- Lexus RX
- McLaren Artura
- Mini Cooper
- Subaru Forester Wilderness
- Toyota Prius
- Toyota Sienna
- Volvo XC90
- Lexus RX
- Toyota Sienna
- Jeep Grand Cherokee

Next question: Is the car a **hybrid**?



No.

Thanks! That helps a lot.

Hybrid Cars Eliminated:

- Acura NSX
- BMW X5
- Ford Maverick
- Jeep Grand Cherokee
- Lexus RX
- McLaren Artura
- Toyota Prius
- Toyota Sienna
- Volvo XC90

Remaining cars: 15

Here is the **updated belief distribution**:

```
sql
```

Each remaining car: 1 / 15 \approx 6.67%

- Audi R8
- BMW 3 Series
- Chevrolet Corvette
- Chevrolet Tahoe
- Dodge Charger
- Genesis GV80
- Jaguar F-Type
- Jeep Wrangler
- Kia Carnival
- Lexus LC 500
- Mini Cooper
- Subaru Forester Wilderness

Next question: Is the car a **sports car**?



No.

Good answer. That rules out all cars labeled as sports cars.

Sports Cars Eliminated:

- Audi R8

- Chevrolet Corvette
- Dodge Charger
- Jaguar F-Type
- Lexus LC 500

Remaining cars: 10

Updated belief distribution:

```
sql
```

Each remaining car: $1 / 10 = 10\%$

- BMW 3 Series
- Chevrolet Tahoe
- Genesis GV80
- Jeep Wrangler
- Kia Carnival
- Mini Cooper
- Subaru Forester Wilderness

Next question: Is the car a **SUV**?



No.

Great! That cuts the list down a lot.

SUVs Eliminated:

- Chevrolet Tahoe
- Genesis GV80
- Jeep Wrangler
- Kia Carnival
- Subaru Forester Wilderness

Remaining cars: 5

Updated belief distribution:

```
sql
```

Each remaining car: $1 / 5 = 20\%$

- BMW 3 Series
- Mini Cooper

(3 additional SUVs removed already)

Next question: Does the car have **rear-wheel drive**?



No.

Excellent, that helps narrow it further.

Rear-Wheel Drive Cars Eliminated:

- BMW 3 Series

Remaining cars: 4

Updated belief distribution:

sql

Each remaining car: $1 / 4 = 25\%$

- Mini Cooper
- Kia Carnival
- Subaru Forester Wilderness
- Chevrolet Tahoe

Next question: Does the car have **front-wheel drive**?



Yes.

Nice. That removes the cars without front-wheel drive.

Cars Without Front-Wheel Drive Eliminated:

- Subaru Forester Wilderness
- Chevrolet Tahoe

Remaining cars: 2

Updated belief distribution:


```
sql
```

Each remaining car: 1 / 2 = 50%

- Mini Cooper
- Kia Carnival

Next question: Does the car have **4 seats**?



Yes.

Perfect. That seals it.

Cars Without 4 Seats Eliminated:

- Kia Carnival (has 7+ seats)

Remaining car:

- **Mini Cooper**

Belief distribution:

```
yaml
```

Mini Cooper: 100%

🎉 **My guess is: Mini Cooper.**

Is that your hidden car?