

Object Guessing Game



This is a synthetic attributes dataset. I have a hidden object in mind. You are allowed to ask me binary questions about the hidden object's attributes, so you can figure out what it is. After receiving an answer, at each step you must print your current belief distribution about the possible hidden object. We can stop when there are no more distinguishing attributes between the remaining options. (You're not allowed to solve this using programming.)

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"a": true,
"b": true,
"c": false,
"d": true,
"e": false,
"f": true,
"g": true,
"h": false,
"i": false,
"j": false,
"k": false
},
" 6be": {
"a": true,
"b": true,
"c": false,
"d": true,
"e": false,
"f": true,
"g": true,
"h": true,
"i": true,
"j": true,
"k": false
},
" 6bf": {
"a": true,
"b": true,
"c": false,
"d": true,
"e": false,
"f": true,
"g": true,
"h": true,
"i": true,
"j": true,
"k": true
},
" 6cf": {
"a": true,

```

```

    "b": true,
    "c": false,
    "d": true,
    "e": true,
    "f": false,
    "g": false,
    "h": true,
    "i": true,
    "j": true,
    "k": true
  },
  " 6ec": {
    "a": true,
    "b": true,
    "c": false,
    "d": true,
    "e": true,
    "f": true,
    "g": false,
    "h": true,
    "i": true,
    "j": false,
    "k": false
  },
  " 707": {
    "a": true,
    "b": true,
    "c": true,
    "d": false,
    "e": false,
    "f": false,
    "g": false,
    "h": false,
    "i": true,
    "j": true,
    "k": true
  },
  " 71a": {
    "a": true,
    "b": true,
    "c": true,
    "d": false,
    "e": false,
    "f": false,
    "g": true,
    "h": true,
    "i": false,
    "j": true,
    "k": false
  },
  " 722": {

```



```

"a": true,
"b": true,
"c": true,
"d": false,
"e": false,
"f": true,
"g": false,
"h": false,
"i": false,
"j": true,
"k": false
},
" 769": {
"a": true,
"b": true,
"c": true,
"d": false,
"e": true,
"f": true,
"g": false,
"h": true,
"i": false,
"j": false,
"k": true
},
" 78f": {
"a": true,
"b": true,
"c": true,
"d": true,
"e": false,
"f": false,
"g": false,
"h": true,
"i": true,
"j": true,
"k": true
},
" 7a3": {
"a": true,
"b": true,
"c": true,
"d": true,
"e": false,
"f": true,
"g": false,
"h": false,
"i": false,
"j": true,
"k": true
},

```

```
" 7c4": {
  "a": true,
  "b": true,
  "c": true,
  "d": true,
  "e": true,
  "f": false,
  "g": false,
  "h": false,
  "i": true,
  "j": false,
  "k": false
},
" 7c5": {
  "a": true,
  "b": true,
  "c": true,
  "d": true,
  "e": true,
  "f": false,
  "g": false,
  "h": false,
  "i": true,
  "j": false,
  "k": true
},
" 7f0": {
  "a": true,
  "b": true,
  "c": true,
  "d": true,
  "e": true,
  "f": true,
  "g": true,
  "h": false,
  "i": false,
  "j": false,
  "k": false
}
}"
```

Is attribute **a** true for your hidden object?



Yes.

Here's my current belief distribution, updated after learning that **a is true** (each remaining object is equally likely):

Object ID	Probability
40b	$1 / 41 \approx 0.0244$
418	$1 / 41$
421	$1 / 41$
442	$1 / 41$
444	$1 / 41$
489	$1 / 41$
4a2	$1 / 41$
4c1	$1 / 41$
4de	$1 / 41$
4e0	$1 / 41$
4ee	$1 / 41$
4f2	$1 / 41$
4fc	$1 / 41$
509	$1 / 41$
50b	$1 / 41$
519	$1 / 41$
56f	$1 / 41$
5a9	$1 / 41$
5b7	$1 / 41$
5d8	$1 / 41$
5e1	$1 / 41$
5fa	$1 / 41$
625	$1 / 41$
67d	$1 / 41$
68a	$1 / 41$
697	$1 / 41$
69d	$1 / 41$
6b0	$1 / 41$
6be	$1 / 41$
6bf	$1 / 41$
6cf	$1 / 41$
6ec	$1 / 41$
707	$1 / 41$
71a	$1 / 41$
722	$1 / 41$
769	$1 / 41$
78f	$1 / 41$

Object ID	Probability
7a3	1 / 41
7c4	1 / 41
7c5	1 / 41
7f0	1 / 41

My next question:

Is attribute **b** true for your hidden object?



Yes.

Here's my updated belief distribution after learning that **b is true** (all remaining objects are equally likely):

Object ID	Probability
625	1 / 19 \approx 0.0526
67d	1 / 19
68a	1 / 19
697	1 / 19
69d	1 / 19
6b0	1 / 19
6be	1 / 19
6bf	1 / 19
6cf	1 / 19
6ec	1 / 19
707	1 / 19
71a	1 / 19
722	1 / 19
769	1 / 19
78f	1 / 19
7a3	1 / 19
7c4	1 / 19
7c5	1 / 19
7f0	1 / 19

My next question:

Is attribute **c** true for your hidden object?



Yes.

Here's my updated belief distribution after learning that **c is true** (every remaining object is equally likely):

Object ID	Probability
707	$1/9 \approx 0.111$
71a	$1/9$
722	$1/9$
769	$1/9$
78f	$1/9$
7a3	$1/9$
7c4	$1/9$
7c5	$1/9$
7f0	$1/9$

My next question:

Is attribute **d** true for your hidden object?



Yes.

Here's my updated belief distribution after learning that **d is true** (each remaining object is equally likely):

Object ID	Probability
78f	$1/5 = 0.20$
7a3	$1/5 = 0.20$
7c4	$1/5 = 0.20$
7c5	$1/5 = 0.20$
7f0	$1/5 = 0.20$

My next question:

Is attribute **e** true for your hidden object?



Yes.

Here's my updated belief distribution after learning that **e is true** (all remaining objects are equally likely):

Object ID	Probability
7c4	$1/3 \approx 0.333$
7c5	$1/3 \approx 0.333$
7f0	$1/3 \approx 0.333$

My next question:

Is attribute **f** true for your hidden object?



No.

Here's my updated belief distribution after learning that **f is false**:

Object ID	Probability
7c4	0.50
7c5	0.50

These two objects are identical on every remaining attribute except **k**.

My next question:

Is attribute **k** true for your hidden object?



Yes.

Here's my updated belief distribution after learning that **k is true**:

Object ID	Probability
7c5	1.00

There's only one possible object left, so we're done.

Your hidden object is 7c5.