
CS 232:
Artificial Intelligence

Spring 2024

Prof. Carolyn Anderson
Wellesley College

Help hours

Help hours for the rest of the semester:

- ♦ My hours **today**: 3:30-4:30
- ♦ Lyra's hours **Sunday**: 4-6
- ♦ My hours **Monday**: 4-5:15
- ♦ My hours **next Friday**: 3:30-4:30
- ♦ By appointment for the rest of finals

Final Project Presentations

- ◆ 2-3 minutes per person
- ◆ 1 slide (upload to Google Drive by 11:59pm on Monday)
- ◆ Please be respectful of your classmates' presentations

What Have We Done?

Our Exploration of Narrow AI

Image
Classification

Text
Generation

Game-playing

Regression

Neural
Networks

Classical
Search

Reinforcement
Learning

Text
Classification

Transfer
Learning

Navigation

Robotics

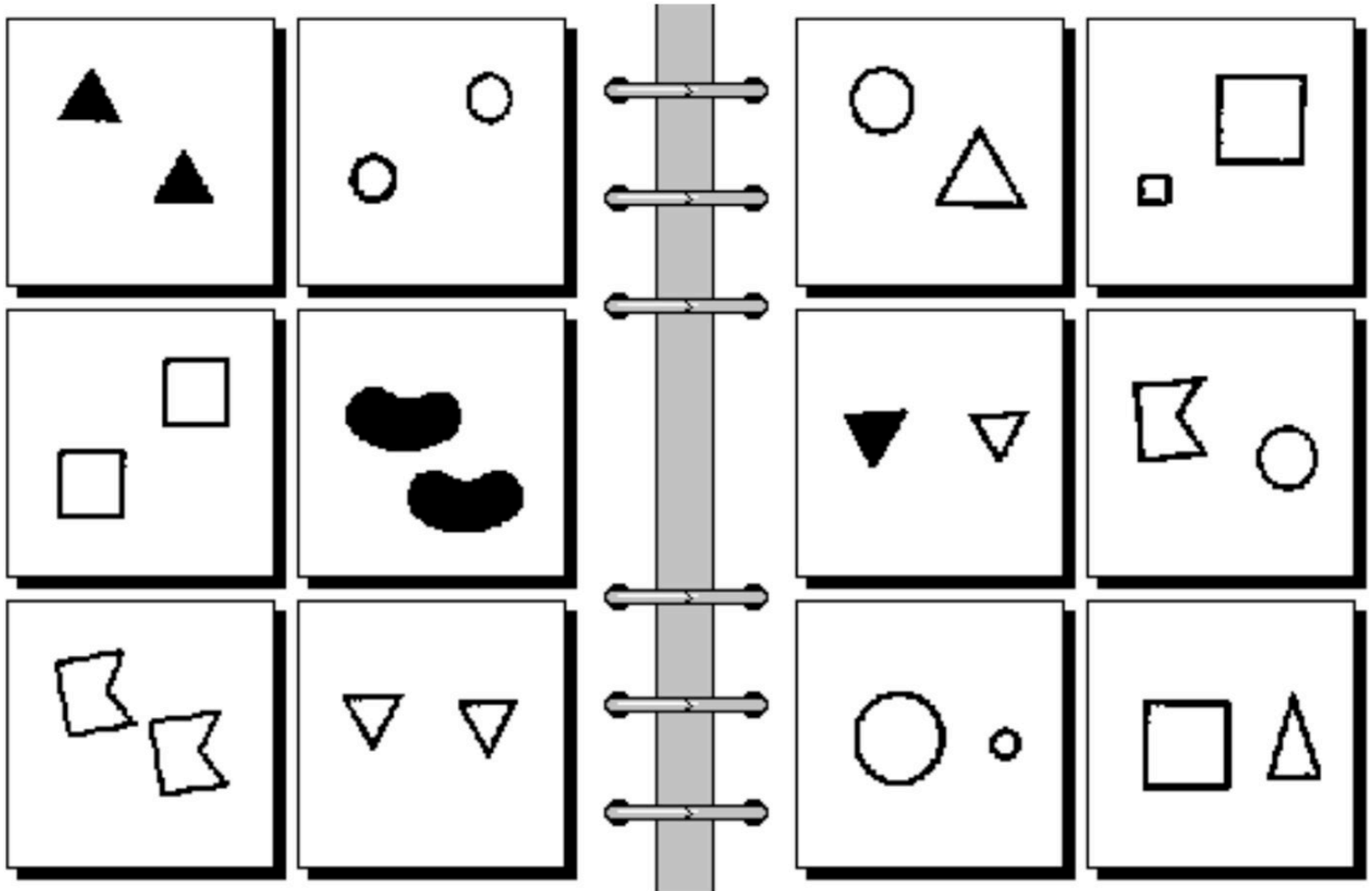
Image
Generation

How do we evaluate
general AI?

Bongard Problems

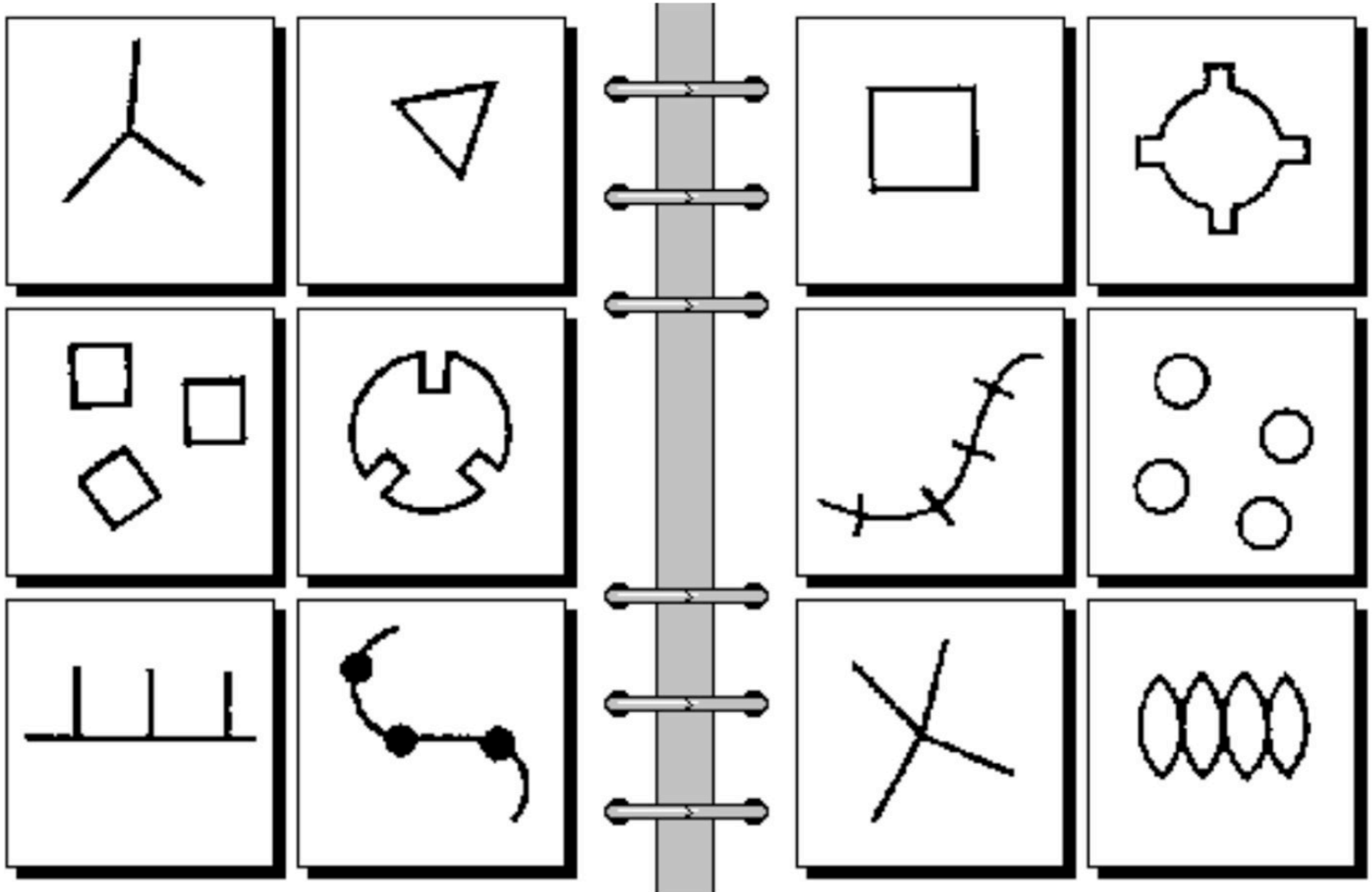
- ◆ Created by Russian computer scientist Mikhail Moiseevich Bongard
- ◆ Present two sets of diagrams and asks agent to explain what distinguishes the two sets

BP#57. Designer: M. M. Bongard

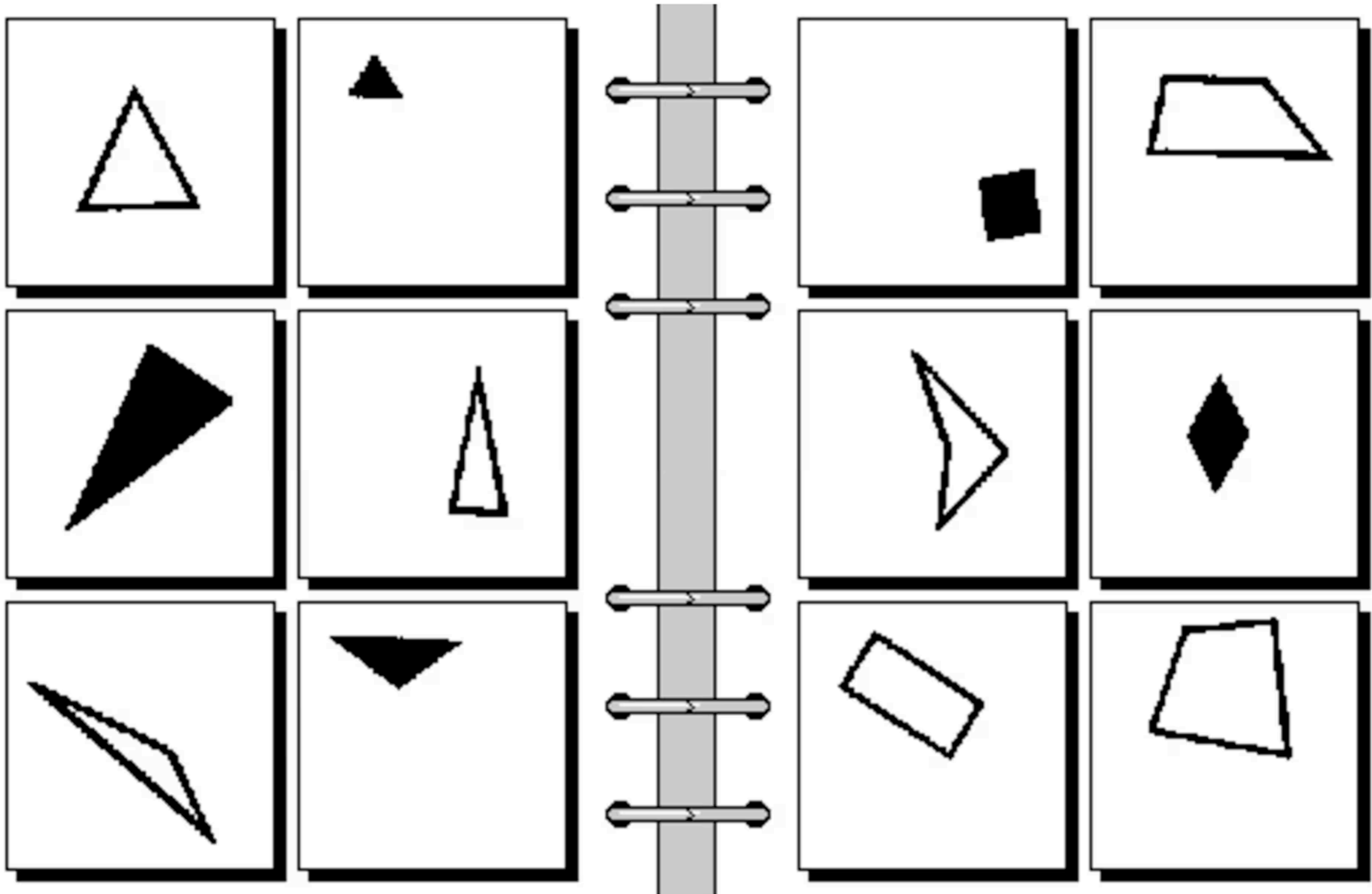


Explain the pattern or rule that distinguishes the six boxes on the left from the six boxes on the right.

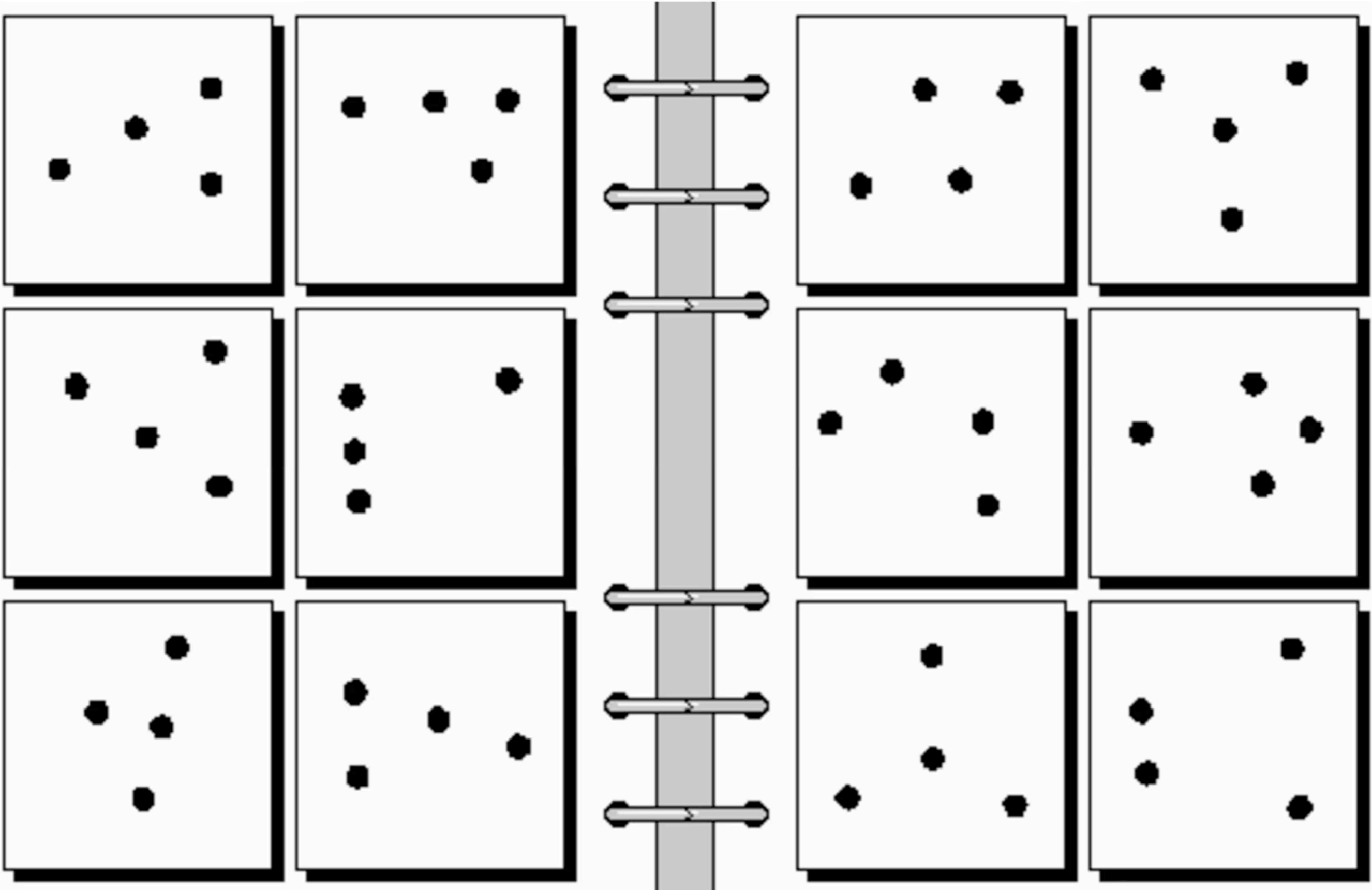
BP#91. Designer: M. M. Bongard



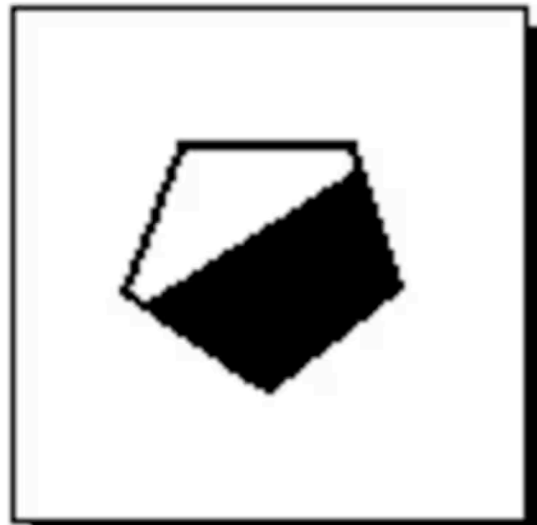
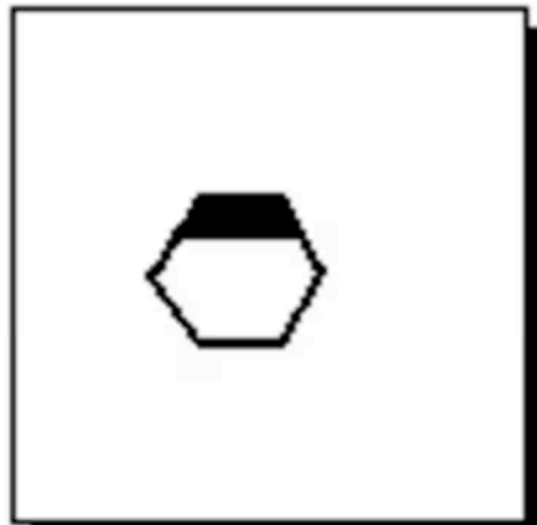
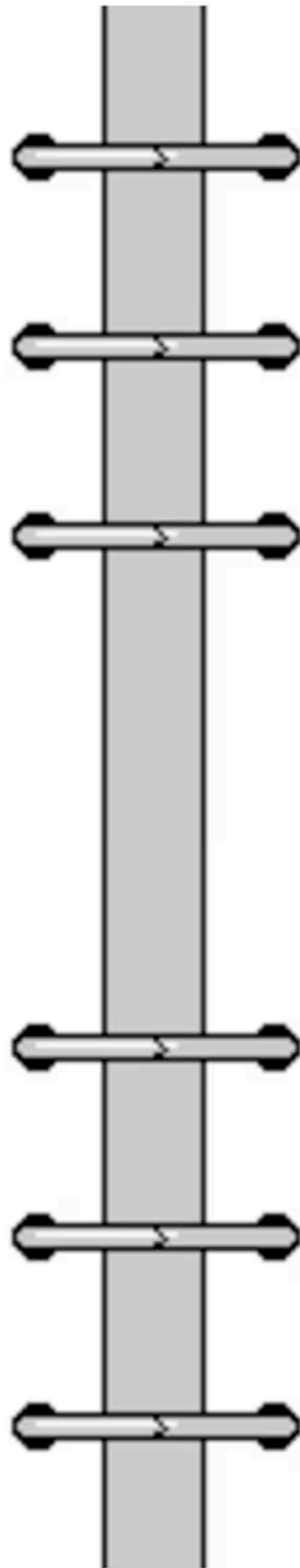
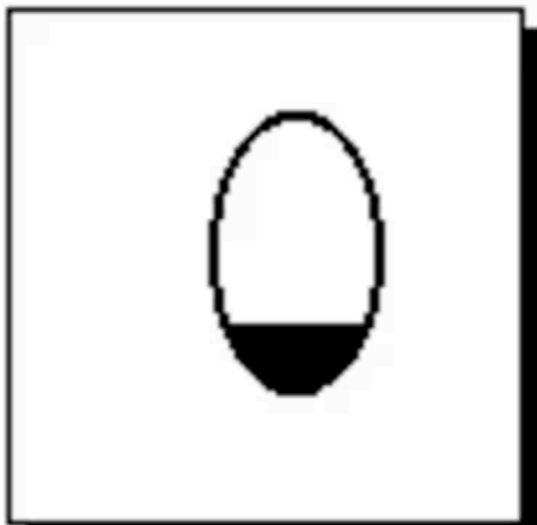
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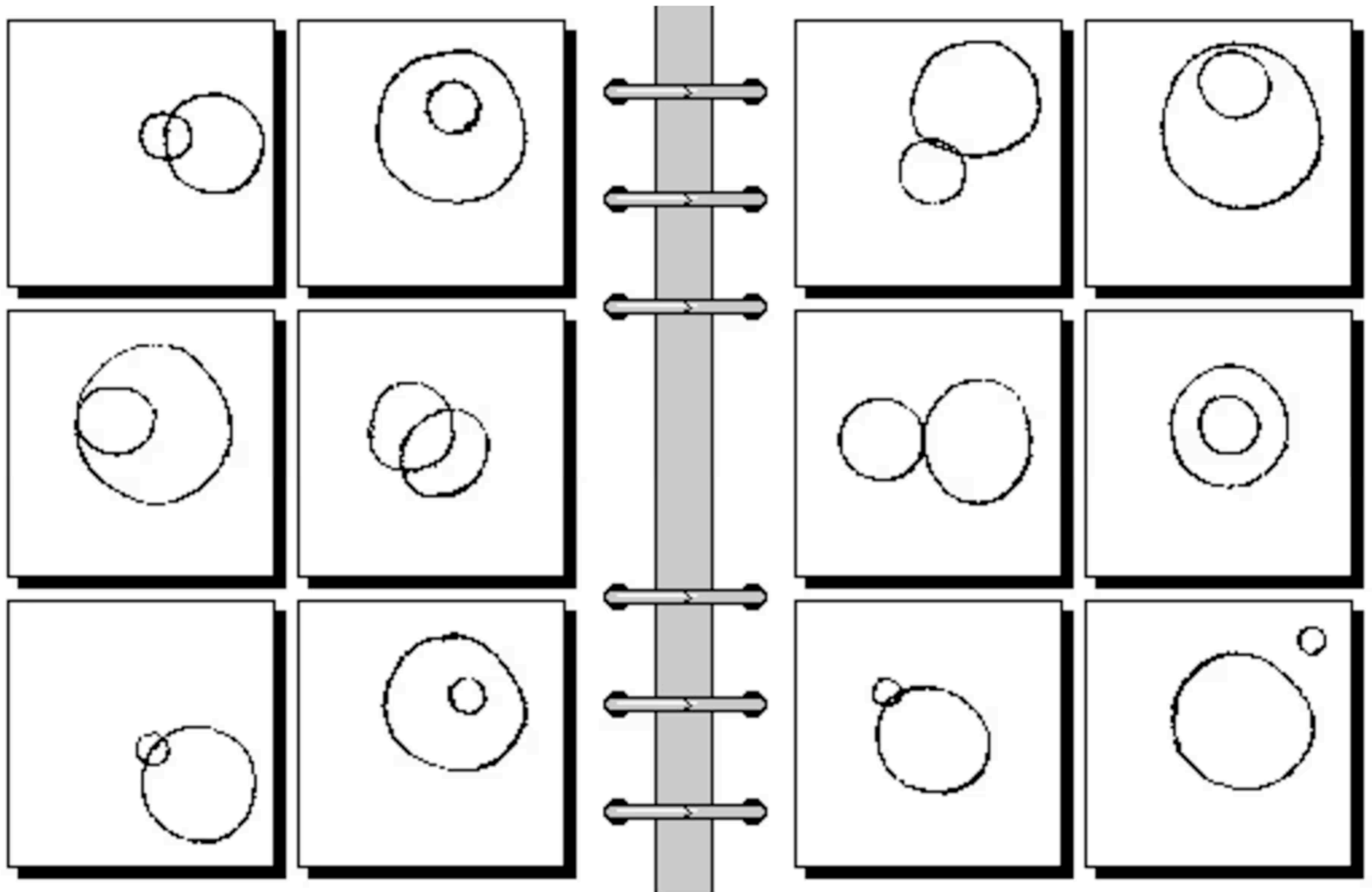
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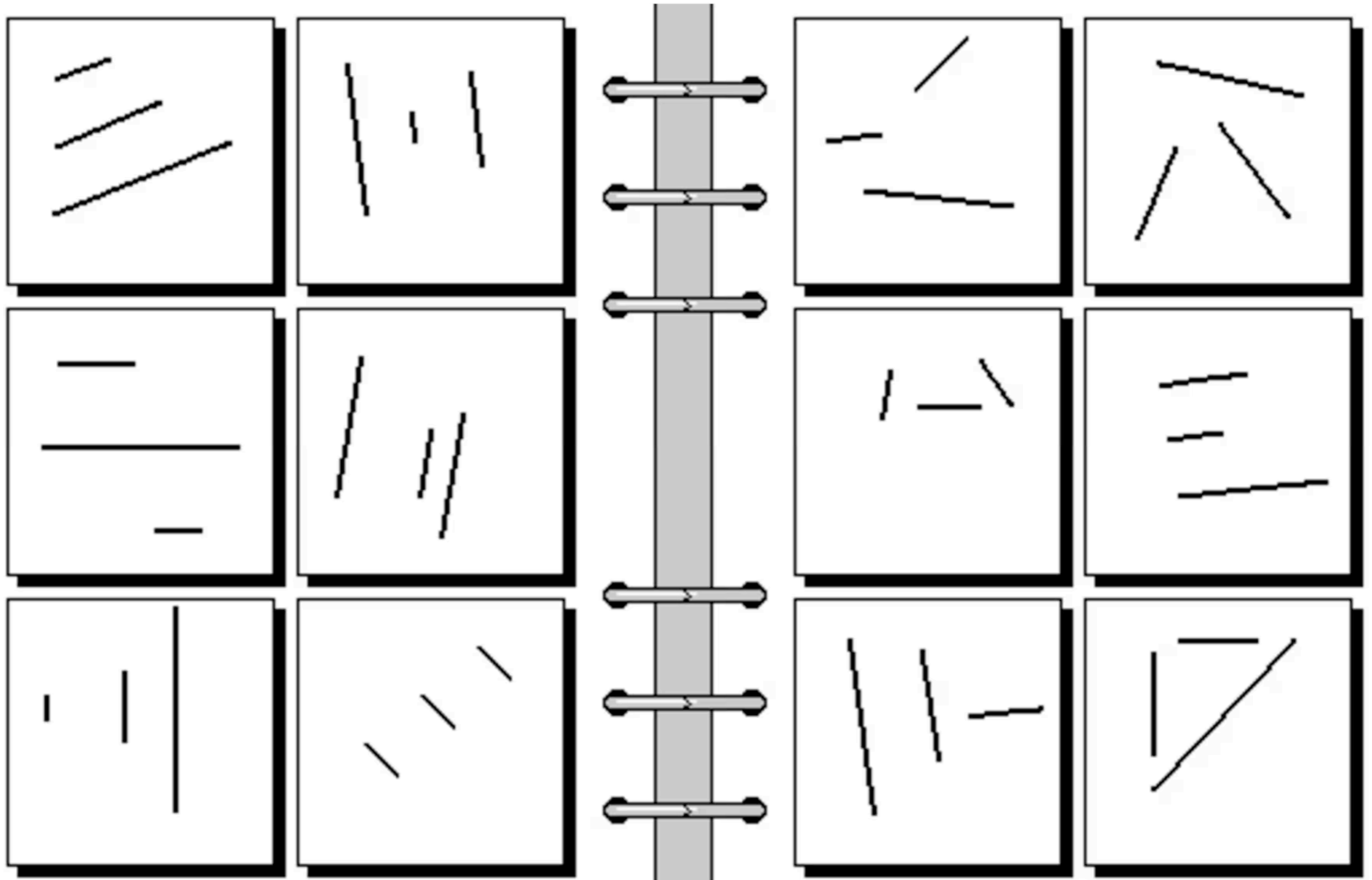
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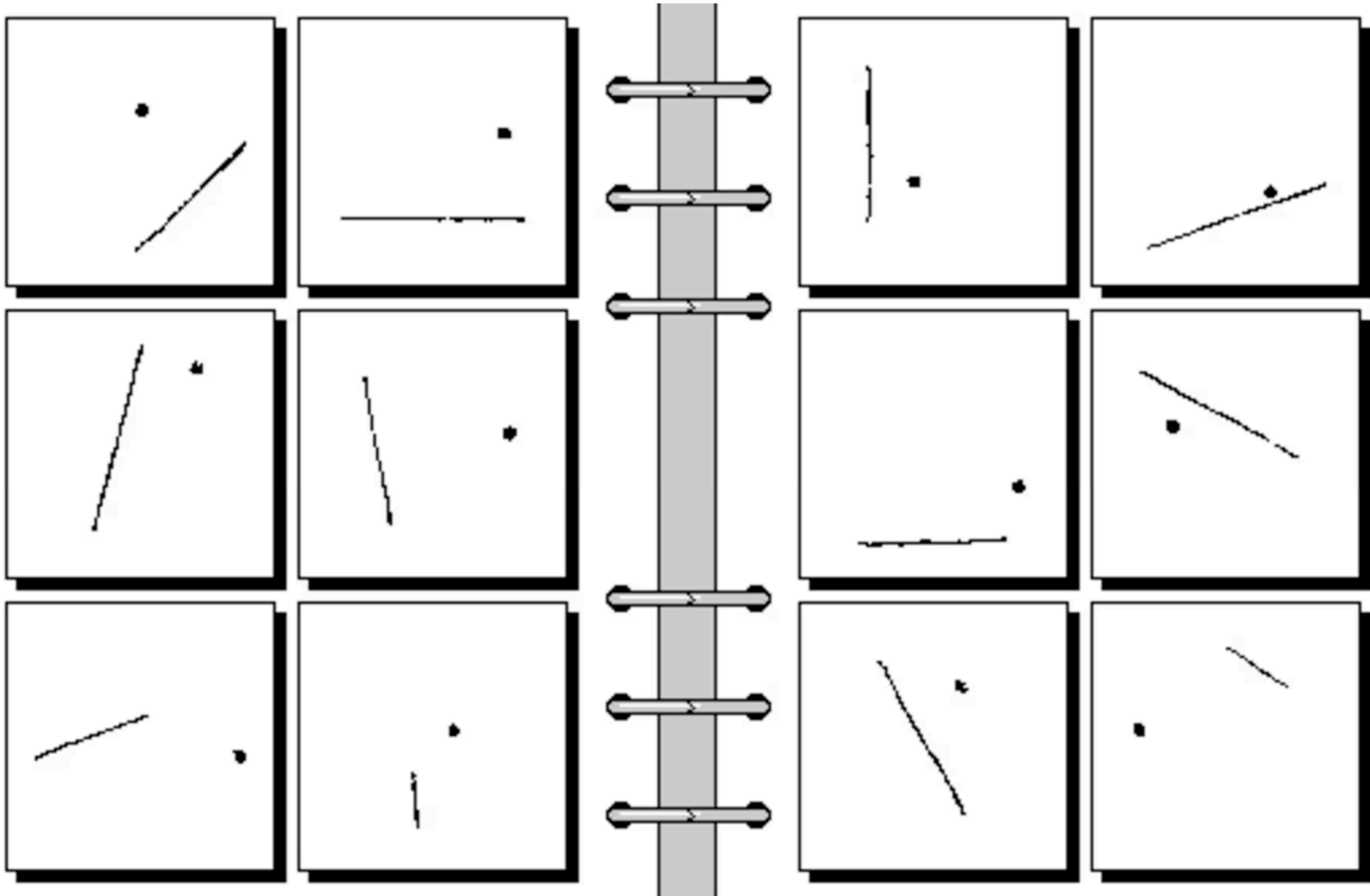
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The Imitation Game (Turing Test)

Turing Test

"I believe that in about fifty years' time it will be possible to programme computers, with a storage capacity of about 10^9 , to make them play the imitation game so well that an average interrogator will not have more than 70 percent chance of making the right identification after five minutes of questioning. The original question, 'Can machines think!' I believe to be too meaningless to deserve discussion. Nevertheless I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted."

—Alan Turing, 1950

ELIZA

Welcome to

```
EEEEEE LL      IIII  ZZZZZZ  AAAAA
EE      LL      II     ZZ     AA   AA
EEEEEE LL      II     ZZZ    AAAAAA
EE      LL      II     ZZ     AA   AA
EEEEEE LLLLLL IIII  ZZZZZZ  AA   AA
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Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

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ELIZA: Is something troubling you ?
YOU:   Men are all alike.
ELIZA: What is the connection, do you suppose ?
YOU:   They're always bugging us about something or other.
ELIZA: Can you think of a specific example ?
YOU:   Well, my boyfriend made me come here.
ELIZA: Is it important to you that your boyfriend made you come here ?
YOU:   He says I'm depressed much of the time.
ELIZA: I am sorry to hear that you are depressed.
YOU:   It's true. I am unhappy.
ELIZA: Can you explain what made you unhappy ?
YOU:
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MIT circa 1966

ELIZA

"[In] artificial intelligence ... machines are made to behave in wondrous ways, often sufficient to dazzle even the most experienced observer. But once a particular program is unmasked, once its inner workings are explained ... its magic crumbles away; it stands revealed as a mere collection of procedures ... The observer says to himself "I could have written that". With that thought, he moves the program in question from the shelf marked "intelligent," to that reserved for curios."

— Joseph Weizenbaum, in the ELIZA paper

Two Truths and an AI

Two Truths and an AI

Write a story about a goat who wears boots and likes to eat cactus.

Submission 1

Once upon a time, in a land far far away, there lived a goat named Nancy. Nancy lived on a farm with her beloved farmer near the desert, and as such developed a love for the environment surrounding her. As a young kid, Nancy was mesmerized by the cactus. She stared in awe of its bright green color, its gleaming spines, and intriguing shapes. She inched closer to take a bite, not realizing the ground nearby was covered in cactus spines. Poor Nancy bleated in pain as the farmer delicately took out each and every spine from her hooves later that evening.

But, Nancy was not deterred. The next day, the farmer made sure she wore some sturdy boots, and she set off again for the cactus. This time, she managed to get a bite. But, once again Nancy shed a tear for every spine the farmer had to remove from her tongue that evening. Seeing her valiant effort, the farmer now cuts and prepares cactus for Nancy every weekend as a treat for her work on the farm.

Submission 2

In the rugged expanse of the desert, there lived a goat named Gusty, whose adventures were as unique as his fashion sense. With leather boots snugly strapped to his hooves, he traversed the rocky terrain with ease, his curiosity leading him to the most unlikely of culinary delights – cactus. While other goats contented themselves with grass and shrubs, Gusty relished the challenge of nibbling on the succulent pads of the prickly plants, his boots providing protection against the sharp thorns. With each crunch of spiky goodness, Gusty proved that sometimes the most unexpected cravings lead to the most thrilling adventures.

Submission 3

Once upon a time, there was a goat named Gilbert, he lived in the countryside of New Zealand. He was of vibrant personality with smooth brown skin and short pointy horns, which made him lovable by everyone in the neighborhood. Gilbert's owner loved him so much that he made him a pair of boots. These boots were made from an original brown leather that a person far away wouldn't recognize the difference between Gilbert's legs and the boots. Because of this, Gilbert could walk in any field, even the ones with cacti thorns on the ground. He was the only goat that could hang out there and so he became fond of eating cacti. Each day, he would excitedly run to the cacti field to eat in peace without other goats' disturbance!

Two Truths and an AI

Describe a favorite piece of clothing of yours from when you were younger. Tell us about how old you were when you had it, and why you remember it still.

Submission 1

When I was around 10 years old, I had this worn-out denim jacket that was my absolute favorite piece of clothing. It had patches from various places I visited with my family sewn onto it, like a small yellow sun from a trip to the beach and a red maple leaf from a visit to a national park. Each patch held a memory, and looking at them always made me smile.

What made this jacket special was that it felt like a canvas of my adventures, a tangible reminder of the places I had been and the experiences I had. It wasn't just a piece of clothing; it was a storytelling garment that sparked conversations and allowed me to relive those moments whenever I put it on.

Submission 2

When I was in preschool, around 3 or 4 years old, my favorite article of clothing was a long-sleeve teal blue t-shirt with pink and purple rhinestones on the front. I wore it all the time, to school, to music class, to the park, everywhere! My parents were constantly doing laundry so that I could wear this one shirt. I loved the shirt so much that when I finally outgrew it, my parents felt bad about getting rid of it, so instead of donating it they put it on my favorite teddy bear. It was a perfect fit! I still have the teddy bear and the t-shirt today.

Submission 3

As a five-year-old, there was never a time when I didn't have it. A ripped-up yellowish-white blanket that essentially became so attached to my hip that it became a worthy piece of clothing that remained most important to me. I would bring my "blankey" everywhere I went and I always had it while I was sleeping. The days when it needed to be washed were the days that I never slept well. I remember it to this day because "blankey" was never just a blanket to me. It was a symbol and companion to all of my cries, laughter, and celebration throughout my childhood.

The day I was forced to give it up even remains fresh in my mind. I was sitting in my room one night getting ready to attend my first day of fifth grade. "Blankey" was sitting on my lap while my mom walks in. She sits down on my bed and gives me a serious look. She exhales a deep breath and says "honey, I know you love 'blankey', but I believe it is time to throw it out. It is so ripped up that I think it would be better in the trash than in your bed at this point. You are a fifth grader now and your bed should reflect that". You can imagine how little fifth grade me, who always claimed to be a big girl, gave up "blankey" with tears in her eyes and a sleepless night.

Two Truths and an AI

If Wellesley CS released an album, what would it be called? What would the cover art look like?

Submission 1

If Wellesley CS released an album, it would be a rock music album called "Course Registration Chaos" due to high demand for Computer Science classes every semester. The cover art would be in a comic style, capturing the chaos during the course registration process both from the professor and student side. A professor can be found answering emails regarding courses, while a student can be found repeatedly clicking the registration button to try to get into a class.

Submission 2

If Wellesley CS (Computer Science) released an album, it might be called "Binary Beats: Algorithms of Harmony".

The cover art could feature a vibrant, abstract representation of computer code swirling and intertwining, reminiscent of a musical staff. Bits and bytes could dance across the cover, forming intricate patterns that evoke both the complexity of coding and the rhythm of music. Perhaps there could be elements of both analog and digital imagery, symbolizing the fusion of technology and creativity inherent in computer science and music.

Submission 3

If the Wellesley CS Department released an album it would be called Coding Beats. The cover would be the inside of a computer such as the motherboard that is brightly colored and decorated with music notes.

Wrap Up

“A more serious byproduct of the tendency to talk about machines in anthropomorphic terms is the companion phenomenon of talking about people in mechanistic terminology. The critical reading of articles about computer-assisted learning... leaves you no option: in the eyes of their authors, the educational process is simply reduced to a caricature, something like the building up of conditional reflexes. For those educationists, Pavlov’s dog adequately captures the essence of Mankind — while I can assure you, from intimate observations, that it only captures a minute fraction of what is involved in being a dog.” --- Edsger Dijkstra