

Pattern Recognition for Efficiency

Here are some examples of level 3 or level 2 solutions to problems.

For each example, can you find a pattern and rewrite it more efficiently?

A. Falak is writing pseudocode for a tic-tac-toe game.

First player places an X

Second player places an O

First player places an X

Second player places an O

First player places an X

Second player places an O

First player places an X

Second player places an O

First player places an X

But stop earlier if someone gets three in a row

B. Leo is making lunch for his three siblings. He wrote down the instructions like this:

1. Make Jo a sandwich.
2. Put carrots in a bag for Jo.
3. Put Jo's sandwich in their lunch bag.
4. Put Jo's carrots in their lunch bag.
5. Put a juice box in Jo's lunch bag.
6. Make Shauna a sandwich.
7. Put carrots in a bag for Shauna.
8. Put Shauna's sandwich in her lunch bag.
9. Put Shauna's carrots in her lunch bag.
10. Put a juice box in Shauna's lunch bag.
11. Make Luis a sandwich.
12. Put carrots in a bag for Luis.
13. Put Luis' sandwich in his lunch bag.
14. Put Luis' carrots in his lunch bag.
15. Put a juice box in Luis' lunch bag.

C. I'm trying to explain to my friend how to draw a flower.

- Draw a circle for the center.
- Draw a long oval sticking out the right side of the circle.
- Draw a long oval sticking out the top right of the circle.
- Draw a long oval sticking out the top of the circle.
- Draw a long oval sticking out the top left of the circle.
- Draw a long oval sticking out the left side of the circle.
- Draw a long oval sticking out the bottom left of the circle.
- Draw a long oval sticking out the bottom of the circle.
- Draw a long oval sticking out the bottom right of the circle.
- Draw a straight line down from the bottom.
- Draw a diagonal-up football shape partway up the line.

D.

```
>>> print('*****')
>>> print('****')
>>> print('***')
>>> print('**')
>>> print('*')
```

E.

```
>>> if animal == 'gorilla':
>>>     ape = 'yes'
>>> elif animal == 'chimpanzee':
>>>     ape = 'yes'
>>> elif animal == 'orangutan':
>>>     ape = 'yes'
>>> elif animal == 'gibbon':
>>>     ape = 'yes'
>>> elif animal == 'bonobo':
>>>     ape = 'yes'
>>> else:
>>>     ape = 'no'
```

F.

```
>>> vowel1 = 'A'
>>> vowel2 = 'E'
>>> vowel3 = 'I'
>>> vowel4 = 'O'
>>> vowel5 = 'U'
>>> if letter == vowel1 or letter == vowel2 or letter == vowel3 or
    letter == vowel4 or letter == vowel5 or letter == ' ':
>>>     print(letter)
```

G.

```
>>> dieRoll = random.randint(1, 6)
>>> score = dieRoll
>>> dieRoll = random.randint(1, 6)
>>> score += dieRoll
>>> dieRoll = random.randint(1, 6)
>>> score += dieRoll
>>> if score > 12:
>>>     print('You win!')
```