

Python intro/refresher*(find and work with a partner)*

The goal of the program below is to count how many times a given letter occurs in a given phrase. The user should specify both the phrase and the letter. (`input` is one way to do this in Python.) For example, the following inputs (first two lines) should generate the output on the third line:

```
phrase: creative code
letter: e
number of e's: 3
```

Student X has written the following code for this task. Based on our discussion today, try to find all the issues (with both style and correctness) with this code. Also discuss any strengths of this code.

```
# ask the user for a phrase and a letter
phrase = input("phrase: ")
letter = input("letter: ")
numChars = len(phrase)

# go through each character in the phrase
for i in range(numChars):
    # add on 1 each time we see the desired letter
    if i == letter:
        count = count + 1

# example of string formatting
print(f"Number of letters: {count}")
```

1. What is this class for? How many *instance variables* are there? How many *methods*?
2. Complete the `get_value(..)` method below.
3. Complete the `roll(..)` method below.
4. What is wrong with the `__str__(..)` method? Fix this below.
5. Does a *constructor* return something? Why or why not?
6. Complete the `main` function.

```
import random

class Die:

    def __init__(self, num_sides: int) -> None:
        """Construct a new die with the given number of sides."""
        self.sides: int = num_sides
        self.value: int = 1 # default starting value

    def get_value(self) -> int:
        """Return the current value of the die."""

    def roll(self) -> None:
        """Roll the die and update its current value."""

    def __str__(self) -> str:
        """Return a string describing the die and its current value."""
        print(f"{self.sides}-sided die, current value: {self.value}")

def main() -> None:
    # TODO: create 8-sided dice (two die)

    # TODO: roll both until we get the same value

main()
```