

Team: \_\_\_\_\_

Team Members:

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## 1 Interpreting Programs

What do the following programs print?

**A.**

```
for num in range(1, 11):  
    if num > 5:  
        print num
```

**B.**

```
x = 1  
y = 10  
if x > 0:  
    print("A")  
    if y == 5:  
        print("B")  
    print("C")
```

**C.**

```
# assume the user enters 3
num = int(input("How many greetings do you want? "))
if num > 0:
    for i in range(num):
        print("Howdy!")
else:
    print("fine then")
```

**D.**

```
for i in range(3):
    for j in range(3):
        print(i, j)
```

## 2 Writing Programs

**A.** It's harder than you probably think to determine if a year is a leap year or not – it's not just every 4 years. The rules are:

1. If the year is divisible by 400 it's a leap year
2. Else if it's divisible by 100 it's **not** a leap year
3. Else if it's divisible by 4 it is a leap year
4. Otherwise it's not a leap year

Write a Python program to read in a year and tell the user whether it's a leap year or no.

**B.** Many systems require that user names be all lower-case letters. Write a program to read in a user's username and check if everything in it is a lower-case letter. If so, print "Valid". If not, print "Invalid".

**C. Challenge:** An infinite series is a list of numbers with some repeating pattern to them. One famous infinite series is the following:

$$\frac{1}{1} + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64} + \dots$$

Write a program to read in a number, called N, from the user. Then add up the first N numbers in this series. For example, if the user enters 3, it should add  $\frac{1}{1} + \frac{1}{2} + \frac{1}{4}$  and print the answer.

Bonus: If you added *all* of the infinite numbers, what do you think the answer would be?