DATA C88C
Spring 2026

Control
Discussion 2: February 2, 2026

While and If

Learning to use `if` and `while` is an essential skill. During this discussion, focus on what we've studied in the first three lectures: - `if`: runs code only when a condition is true - `while`: repeats code as long as a condition is true - assignment (`=`): stores a value in a variable - comparison (`<`, `>`, `==`, …): checks relationships between values - arithmetic: `+`, `-`, `*`, `/`

Please **don't use** features of Python that we haven't discussed in class yet, such as `for`, `range`, and lists. We'll have plenty of time for those later in the course, but now is the time to practice the use of `if` (textbook section 1.5.4) and `while` (textbook section 1.5.5).

Q1: Fizzbuzz

Implement the classic *Fizz Buzz* sequence. The `fizzbuzz` function takes a positive integer `n` and prints out a *single line* for each integer from 1 to `n`. For each `i`:

- If `i` is divisible by both 3 and 5, print `fizzbuzz`.
- If `i` is divisible by 3 (but not 5), print `fizz`.
- If `i` is divisible by 5 (but not 3), print `buzz`.
- Otherwise, print the number `i`.

Try to make your implementation of `fizzbuzz` concise.

```
def fizzbuzz(n):
    """
    >>> result = fizzbuzz(16)
    1
    2
    fizz
    4
    buzz
    fizz
    7
    8
    fizz
    buzz
    11
    fizz
    13
    14
    fizzbuzz
    16
    >>> print(result)
    None
    """
    "*** YOUR CODE HERE ***"
```

Q2: Is Prime?

Write a function that returns `True` if a positive integer `n` is a prime number and `False` otherwise.

A prime number n is a number that is not divisible by any numbers other than 1 and n itself. For example, 13 is prime, since it is only divisible by 1 and 13, but 14 is not, since it is divisible by 1, 2, 7, and 14.

Use the `%` operator: `x % y` returns the remainder of `x` when divided by `y`.

```
def is_prime(n):
    """
    >>> is_prime(10)
    False
    >>> is_prime(7)
    True
    >>> is_prime(1) # one is not a prime number!!
    False
    """
    "*** YOUR CODE HERE ***"
```

Q3: Unique Digits

Write a function that returns the number of unique digits in a positive integer.

> **Hints:** You can use `//` and `%` to separate a positive integer into its one's digit and the rest of its digits.
>
> You may find it helpful to first define a function `has_digit(n, k)`, which determines whether a number `n` has digit `k`.

```
def unique_digits(n):
    """Return the number of unique digits in positive integer n.

    >>> unique_digits(8675309) # All are unique
    7
    >>> unique_digits(13173131) # 1, 3, and 7
    3
    >>> unique_digits(101) # 0 and 1
    2
    """
    "*** YOUR CODE HERE ***"









def has_digit(n, k):
    """Returns whether k is a digit in n.

    >>> has_digit(10, 1)
    True
    >>> has_digit(12, 7)
    False
    """
    assert k >= 0 and k < 10
    "*** YOUR CODE HERE ***"
```