# GISC 2335 Class Notes - February 18, 2025

Class Notes - Week 5, Chapter 4  
  
**Key Concepts and Topics**

**Functions and Methods**

- Functions: Reusable blocks of code that perform a specific action. Examples include print(), int(), str(), and type().  
- Syntax: function\_name(arguments)  
- Functions can have multiple arguments separated by commas.  
- Methods: Functions attached to objects. Called using dot notation: object.method(arguments).

- Example:

topic = "Geographic Information Systems"  
 count = topic.count("i")  
 print(count) # Output: 2

**String Methods**

- lower() - Converts string to lowercase  
- upper() - Converts string to uppercase  
- title() - Capitalizes each word

- String indexing and slicing to access characters or substrings.  
 - Index starts at 0.  
 - Negative indices count from the end.  
 - Example:  
 text = "Geography"  
 print(text[5]) # Output: "a"  
- find() - Locates a substring’s position.  
- join() - Joins list elements into a string.  
- split() - Splits string into a list.  
- strip(), lstrip(), rstrip() - Remove whitespace or characters.

**String Formatting**

- format() method:  
 temp = 100  
 print("The temperature is {} degrees".format(temp))  
- f-strings (recommended):  
 print(f"The temperature is {temp} degrees")  
- Avoid % formatting; it’s outdated.

**Boolean Logic**

- Booleans: True and False.  
- Comparisons:  
 == (equals)  
 != (not equals)  
 <, <=, >, >=  
- Logical operators:  
 and, or, not  
- Examples:  
 x = 7  
 print(x < 10) # True

**Boolean functions:**

bool() - Converts values to Boolean.  
 Empty string and zero evaluate to False.

**Data Types and Structures**

- Tuples: Immutable sequences.  
- Dictionaries: Key-value pairs for lookups.  
- Example:  
 state\_lookup = {"Austin": "Texas", "Baltimore": "Maryland"}  
 print(state\_lookup["Austin"]) # Output: Texas  
- Sets: Unordered collections without duplicates.

**Paths and Backslashes**

- Windows paths use backslashes \, but Python treats \ as an escape character.  
- Solutions:  
 Use double backslashes: C:\Users\Crystal  
 Use raw strings: r"C:\Users\Crystal" (recommended)

**Modules**

- Modules: Extensions that add extra functionality to Python.  
- Example:  
 import math  
 print(math.sqrt(16)) # Output: 4.0

**Control Structures**

- if/elif/else: Direct flow based on conditions.  
 if x == 6:  
 print("You win!")  
 elif x == 5:  
 print("Try again.")  
 else:  
 print("You lose.")  
- Indentation defines code blocks.

**Loops**

- while loop: Repeats until condition is false.  
- for loop: Iterates through sequences.  
- Example:  
 for i in range(5):  
 print(i)

**Long Lines and Continuation**

- Use backslash \ for long code lines.  
- Example:  
 print("This is a very long line that wraps across multiple lines.")

**Comments**

- Start with #  
- Good practice to add comments explaining code purpose.

**Coding Guidelines**

- Use consistent variable naming (lowercase, underscores, camelCase is fine if consistent).  
- Never mix tabs and spaces.  
- Comment adequately.  
- Include file headers with author, date, and purpose.

**Instructor Note**

- No class on Thursday.  
- Contact options: Email, Teams, or even carrier pigeon!