**Week 1 – Day 2: Conditionals and Loops**

**🎯 Goal:**

Master how Python makes **decisions** using if, elif, else, and how it **repeats tasks** using for and while loops.

**🧩 Concept Breakdown**

**✅ Conditionals: if / elif / else**

python

Copy code

age = 20

if age >= 21:

print("You can drink.")

elif age >= 18:

print("You can vote but not drink.")

else:

print("You're still a young Padawan.")

**✅ Comparison Operators:**

| **Operator** | **Meaning** | **Example** |
| --- | --- | --- |
| == | Equal to | x == 5 |
| != | Not equal to | x != 5 |
| <, >, <=, >= | Comparisons | x >= 3 |

**🔁 Loops: for, while**

**✅ For Loop:**

python

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for i in range(5):

print("i is", i)

**✅ While Loop:**

python

Copy code

count = 0

while count < 5:

print("count is", count)

count += 1

**✅ Loop Control:**

| **Keyword** | **Purpose** |
| --- | --- |
| break | Exit the loop early |
| continue | Skip rest of loop iteration |
| pass | Placeholder; does nothing |

**🛠️ Practice Exercises:**

**1. Age Checker**

python

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age = int(input("Enter your age: "))

if age < 13:

print("You're a child.")

elif age < 18:

print("You're a teen.")

else:

print("You're an adult.")

**2. FizzBuzz Challenge**

Classic interview question:

python

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for i in range(1, 21):

if i % 3 == 0 and i % 5 == 0:

print("FizzBuzz")

elif i % 3 == 0:

print("Fizz")

elif i % 5 == 0:

print("Buzz")

else:

print(i)

**3. Number Guessing Game**

python

Copy code

import random

secret = random.randint(1, 10)

guess = None

while guess != secret:

guess = int(input("Guess the number (1–10): "))

if guess < secret:

print("Too low!")

elif guess > secret:

print("Too high!")

else:

print("You got it!")

**📌 Checklist for Day 2**

| **Task** | **Done?** |
| --- | --- |
| Practice if / elif / else | 🔲 |
| Use for and while loops | 🔲 |
| Implement FizzBuzz | 🔲 |
| Build a number guessing game | 🔲 |
| Save work as day2\_logic.py or .ipynb | 🔲 |

**🧮 1. range() in Python**

**📌 What is it?**

range() is a **sequence generator**. It produces a series of numbers you can loop through—*but doesn’t actually create a list unless you force it*.

**🧠 Syntax:**

python

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range(start, stop, step)

| **Parameter** | **Purpose** | **Example** |
| --- | --- | --- |
| start | Where to begin (default = 0) | range(3) → starts at 0 |
| stop | Where to stop (NOT inclusive) | range(3) → 0, 1, 2 |
| step | How to increment | range(1, 10, 2) → 1, 3, 5, 7, 9 |

**📌 Common Uses:**

python

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for i in range(5): # 0 to 4

print(i)

for i in range(1, 6): # 1 to 5

print(i)

for i in range(10, 0, -1): # Countdown from 10 to 1

print(i)

range() is like a *lazy list*. It doesn’t use memory to store everything—great for big loops.

**🎲 2. random and randint()**

**📌 What is random?**

The random module lets you generate **pseudo-random numbers**—they *look* random, but they’re created by a set formula.

You need to import it:

python

Copy code

import random

**✅ Common random functions:**

| **Function** | **What it does** | **Example** |
| --- | --- | --- |
| random.random() | Random float between 0.0 and 1.0 | 0.7398... |
| random.randint(a, b) | Random integer between a and b (inclusive) | random.randint(1, 10) might return 4 |
| random.choice(list) | Random item from a list | random.choice(["yes", "no"]) |
| random.shuffle(list) | Randomly reorders the list *in-place* |  |
| random.seed(x) | Sets reproducible randomness | random.seed(42) (always get same sequence) |

**✅ Example:**

python

Copy code

import random

print(random.random()) # e.g., 0.3482

print(random.randint(1, 6)) # Simulates a dice roll

**🌟 What is a *Stretch Challenge*?**

A **Stretch Challenge** = An extra, slightly harder problem to push your learning further 💪  
You **don’t have to do it**, but if you do—you’re preparing for *real problem solving* and interviews.

**💡 Stretch Challenge Example (Day 2):**

**Build a Math Quiz Generator**

* Ask 5 randomly generated math questions (e.g., 3 + 5)
* Score how many the user gets right
* Use:
  + random.randint() to generate numbers
  + input() for answers
  + for loop to repeat questions
  + if to check correctness

**Starter idea:**

python

Copy code

import random

score = 0

for i in range(5):

a = random.randint(1, 10)

b = random.randint(1, 10)

answer = int(input(f"What is {a} + {b}? "))

if answer == a + b:

print("Correct!")

score += 1

else:

print("Wrong!")

print(f"Final Score: {score}/5")

**✅ Quick Summary**

| **Concept** | **Purpose** |
| --- | --- |
| range() | Generates numbers for loops |
| random | Python module for randomness |
| randint(a, b) | Get a random number in a range |
| Stretch Challenge | Optional hard problem to master concepts |