Python Full Course — Lesson Notes

What is Python?

Python is a high-level, interpreted programming language known for its readability and versatility. It is widely used in data science, web development, automation, and AI.

Core Concepts

Variables & Data Types

```
name = "Alice"        # str
age = 25              # int
gpa = 3.85            # float
is_student = True     # bool
skills = ["Python", "SQL"]  # list
info = {"name": "Alice", "age": 25}  # dict
```

Control Flow

```
if score >= 90:
    grade = "A"
elif score >= 80:
    grade = "B"
else:
    grade = "C"

for item in my_list:
    print(item)

while count < 10:
    count += 1
```

Functions

```
def calculate_area(length, width):
    """Calculate the area of a rectangle."""
    return length * width
```

```python
# Lambda (anonymous function)
square = lambda x: x ** 2
```

Lists & Comprehensions

```python
numbers = [1, 2, 3, 4, 5]
squares = [n ** 2 for n in numbers]          # [1, 4, 9, 16, 25]
evens = [n for n in numbers if n % 2 == 0]  # [2, 4]
```

File I/O

```python
with open("data.txt", "r") as f:
    content = f.read()

with open("output.txt", "w") as f:
    f.write("Hello, World!")
```

Key Takeaways

1. Python uses indentation for code blocks — no curly braces.
2. Use list comprehensions for concise, readable loops.
3. Always use `with` statements for file operations.
4. Python is dynamically typed — use type hints for clarity.
