Python Coding Practice Worksheet 1

Focus: Data Types, Variables, Boolean Logic, Conditionals, and String Basics

# Introduction

Python is a versatile and beginner-friendly programming language. Mastering its basic building blocks—data types, variables, boolean logic, conditionals, and strings—will equip you for more advanced coding tasks. This worksheet is designed to reinforce your understanding through explanations and hands-on practice problems.

# Section 1: Data Types

## Overview

Python offers several fundamental data types:

* int – Integer numbers (e.g., 5, -3, 42)
* float – Decimal numbers (e.g., 3.14, -0.001)
* str – Strings (e.g., "hello", 'Python')
* bool – Boolean values (True or False)

## Practice 1

Write the type of each value:

1. 12 example: Int
2. 12.0 \_\_\_\_\_\_\_
3. '12'\_\_\_\_\_\_
4. True\_\_\_\_\_\_
5. False\_\_\_\_\_\_

Identify the data type of the following variables:

1. x = 5 \_\_\_\_\_\_\_\_\_
2. y = 'hello' \_\_\_\_\_\_\_
3. z = 2.5 \_\_\_\_\_\_\_\_\_
4. is\_valid = False \_\_\_\_\_\_\_\_\_
5. Change the value of x from an int to a float and print its new type. Do this in the computer.

## Questions 1

1. Why is it important to know the data type of a variable?
2. What happens if you try to perform mathematical operations on incompatible data types?

# Section 2: Variables

## Overview

Variables are names that store data values. In Python, you don’t need to declare their type explicitly—Python infers the type.

* Variable names should start with a letter or underscore (\_).
* They can contain letters, numbers, and underscores.
* Avoid using Python keywords (e.g., for, if, True) as variable names.

## Practice 2 : Do these on your computer in a new file

1. Create variables for your age, your favorite color, and whether you like pizza (use a boolean value).
2. Assign a string value to a variable named city, then update it to a new value and print both.
3. What happens if you assign the same variable name to a new value?

## Questions 2

1. How does Python handle variable reassignment? Hint: Try it out in your interpreter(vscodium).
2. Is it possible to use numbers in variable names? If so, how? Hint: Try it out in your interpreter.

# Section 3: Boolean Logic

## Overview

Boolean logic is about True and False values, often used in decision-making and conditionals.

* The keywords True and False are case-sensitive.
* Common logical operators:
* and – True if both statements are true
* or – True if at least one statement is true
* not – Negates the value

## Practice 3

1. Evaluate the following expressions:
2. True and False output= \_\_\_\_\_\_\_\_\_
3. not False output= \_\_\_\_\_\_\_\_\_
4. True or False output= \_\_\_\_\_\_\_\_\_
5. (3 > 2) and (5 < 10) output= \_\_\_\_\_\_\_\_\_
6. (3 == 4) or (1 != 2) output= \_\_\_\_\_\_\_\_\_
7. Write a statement that checks if a number is both positive and even. Either here or on the computer.
8. What does not True return? \_\_\_\_\_\_\_\_\_

## Questions 3

1. How does boolean logic help in programming?
2. Write an example where you would use or in a real-world situation.

# Section 4: Conditionals

## Overview

Conditionals allow your program to make decisions:

* Use if, elif, and else statements to control flow.
* Comparison operators:
* == Equal to
* != Not equal to
* > Greater than
* < Less than
* >= Greater than or equal to
* <= Less than or equal to

## Practice 4

1. Write a program that checks if a person is old enough to vote (age ≥ 18) and prints an appropriate message.
2. Write a program that checks if a number is negative, zero, or positive and prints the result.
3. Given a variable score, print "Excellent" if the score is over 90, "Good" if it’s between 70 and 90, and "Needs Improvement" otherwise.

## Questions 4

1. What happens if multiple elif conditions are true?
2. How does Python decide which else block to execute?

# Section 5: String Basics

## Overview

Strings are sequences of characters, used for text manipulation in Python.

* Strings are enclosed in single or double quotes: 'hello', "world"
* Common string operations:
* Concatenation (+)
* Repetition (\*)
* Accessing characters ([])
* Length (len())

## Practice 5

1. Create a string variable greeting with the value "Hello, world!". Print its length and first character.
2. Concatenate two strings: your first name and last name, separated by a space.
3. Write a program that asks the user for their favorite color and prints "Your favorite color is: [color]".
4. Use slicing to print the first three characters of "Python".

## Questions 5

1. What happens if you try to access an index that doesn’t exist in a string?
2. How can you convert an integer to a string?

# Challenge Section

Try these more advanced exercises to deepen your understanding.

1. Write a program that takes a user's age as input, stores it in a variable, and prints whether the user is a child (under 13), teenager (13–17), adult (18–64), or senior (65+).
2. Write a program that checks if a string contains the letter 'a' and prints "Found 'a'" or "No 'a' found".
3. Combine boolean logic and conditionals: Given variables a and b, write a program that prints "Both are positive" only if both are positive numbers.

# Reflection

1. Which section did you find the most challenging?
2. What new concepts did you learn about strings?