Python Assignment 1 — Variables, Data Types, Type Casting, Keywords & Literals

Objective:
Practice and master Python fundamentals: variables, built-in data types, type casting (conversion), reserved keywords, and literals.
This assignment progresses from basic checks to small programs that require combining concepts.

Instructions

1. Create a new Python file or notebook for each question (or group related questions).
2. Add clear comments explaining your logic.
3. Include sample runs (input → output) for each program.
4. Do not use external libraries unless a question explicitly allows it.
5. For written/theory questions, answer succinctly and accurately.

Q1 — Basic: Variable Assignment

Assign values to variables (age, name, is_student, gpa, courses) and print their types using type().

Q2 — Data Types Identification (Short answers)

For each Python literal, state its data type: 100, 3.14, 'c', 'Hello', True, None, (1,2,3), {'a':1}.

Q3 — Keywords Check

Import the keyword module and write a program that checks if a word is a Python keyword.

Q4 — Literals Classification

Given a literal as string input, classify it as Integer, Float, String, Boolean, None, or Other.

Q5 — Type Casting Basics

Demonstrate explicit casting between int, float, str, and bool with valid and invalid cases.

Q6 — Mixed Types Arithmetic

Perform addition based on input type: numeric addition or string concatenation.

Q7 — Temperature Converter

Convert between Celsius and Fahrenheit using user input and type conversion.

Q8 — Variables & Mutability

Explain mutable vs immutable with code showing list (mutable) and tuple (immutable) behavior.

Q9 — Input Validation (type casting + condition)

Take age as input, validate numeric, and classify into Child, Teenager, Adult, or Senior.

Q10 — Keywords & Identifiers

Explain valid Python identifiers and write code to check invalid ones or keywords.

Q11 — Advanced: Expression Parser

Accept simple expressions like '12 * 3.5' and evaluate using type casting and exception handling.