Module 1n: Introduction to Problem Solving and Python Fundamentals

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What are Built-in Functions in Python?

- Built-in functions are functions provided by Python by default.
- No need to import any module to use them.
- They simplify common operations like input, output, type conversion, etc.
- Over 60+ built-in functions available in Python.

How to View All Built-in Functions in Python

- Python provides built-in functions in a special module called `__builtins__`.
- Use the following commands in the Python interpreter or Jupyter Notebook:

Try This in Python

```python
# List all built-in names (functions, constants, etc.)
print(dir(__builtins__))

# List only functions from built-ins
print([f for f in dir(__builtins__) if
callable(getattr(__builtins__, f))])

# Get help/documentation for any function
help(len)
help(abs)
```

Common Built-in Functions

- `print()`, `input()` – Output/Input
- `len()`, `type()`, `id()` – Information
- `int()`, `float()`, `str()`, `bool()` – Type Conversion
- `max()`, `min()`, `sum()`, `abs()`, `pow()` – Math-related
- `sorted()`, `reversed()`, `range()` – Sequence tools

Example

```
name = input("Enter your name: ")
print("Hello", name)

print(len("Python"))        # 6
print(max(4, 12, 9))        # 12
```

Exploring type(), id(), isinstance()

- `type()` – Returns the data type of an object.
- `id()` – Returns the unique memory address of an object.
- `isinstance()` – Checks object's type.

Examples

```
x = 10
print(type(x))          # <class 'int'>
print(id(x))            # Memory address
print(isinstance(x, int))  # True
```

Input and Output Functions

- `input()` – Accepts user input as string
- `print()` – Displays output on screen
- Use `sep`, `end`, and `formatting` in print

Examples

```
age = input("Enter your age: ")
print("Age is:", age)

print("A", "B", "C", sep="-")    # A-B-C
print("End", end="!")            # End!
```

Assignment 1: Input and Output

- Accept the following from the user using `input()`:
    - Name
    - Age
    - Favorite programming language
- Display a sentence using `print()`:
    Hello name, aged age, you love language.

Assignment 2: Type Conversion Functions

- Accept two numbers as input and convert them to:
  - `int`, then add them
  - `float`, then multiply them
  - Convert final results to `str` and print them
- Use: `int()`, `float()`, `str()`

Assignment 3: Mathematical Built-ins

- Accept 3 numbers from user.
- Use built-in functions to:
  - Find the maximum and minimum
  - Find the sum
  - Get absolute difference between first two
  - Raise the third number to power 2 using `pow()`

Assignment 4: Exploring Object Information

- Define variables of types: int, float, str, list.
- Use and print:
    - `type()` – data type
    - `id()` – memory location
    - `isinstance()` – type checking

Assignment 5: Discover More Functions

- Use the following to explore Python built-ins:
- `dir(`$_{builtins}$`)` $- list all$ `help(len),help(sum)` $- documentation$
- Choose 3 new functions and write sample usage for each.

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Don't just code — think, plan, and solve