

Variables & Data Types in Python - Complete Notes

This PDF contains table format notes, interview questions, and practice problems on Python variables and data types.

Data Type Description Example

int Whole numbers $x = 10$

float Decimal numbers $\pi = 3.14$

bool True / False flag = True

str Text name = 'Aamir'

list Mutable sequence [1, 2, 3]

tuple Immutable sequence (1, 2, 3)

dict Key-value pairs {'a': 1}

set Unique unordered values {1, 2, 3}

NoneType Represents no value $x = \text{None}$

Interview Questions

1. What is a variable in Python?
2. What is dynamic typing?
3. Difference between mutable and immutable?
4. What are Python data types?
5. What is None in Python?
6. What is the difference between list and tuple?
7. How do you check the type of a variable?
8. What is a dictionary?
9. What is type casting?
10. Explain Python's memory model for variables.

Practice Problems

1. Create variables of all data types and print their types.
2. Convert a string '100' into int and float.
3. Write a program to swap two variables.
4. Create a list and modify its values. Can you modify a tuple?
5. Create a dictionary for a student with 3 key-value pairs.
6. Convert a list to a set. What changes?
7. Write code to check mutability of list vs tuple.
8. Create a complex number and print its real and imaginary parts.
9. Create a None variable and check its type.
10. Demonstrate dynamic typing with a variable. explain one by one every line and word



python

Always show details

 Copy code

```
from reportlab.platypus import SimpleDocTemplate, Paragraph, Spacer
from reportlab.lib.styles import getSampleStyleSheet
from reportlab.lib.pagesizes import A4

file_path = "/mnt/data/Variables_DataTypes_Python_Notes.pdf"
styles = getSampleStyleSheet()
story = []

content = """
<h1>Variables & Data Types in Python - Complete Notes</h1>

<h2>Table: Python Data Types</h2>
<table border="1" cellspacing="3" cellpadding="3">
<tr><th>Data Type</th><th>Description</th><th>Example</th></tr>
<tr><td>int</td><td>Whole numbers</td><td>x = 10</td></tr>
<tr><td>float</td><td>Decimal numbers</td><td>pi = 3.14</td></tr>
<tr><td>bool</td><td>True / False</td><td>flag = True</td></tr>
<tr><td>str</td><td>Text</td><td>name = 'Aamir'</td></tr>
<tr><td>list</td><td>Mutable sequence</td><td>[1, 2, 3]</td></tr>
<tr><td>tuple</td><td>Immutable sequence</td><td>(1, 2, 3)</td></tr>
<tr><td>dict</td><td>Key-value pairs</td><td>{'a': 1}</td></tr>
<tr><td>set</td><td>Unique unordered values</td><td>{1, 2, 3}</td></tr>
<tr><td>NoneType</td><td>Represents no value</td><td>x = None</td></tr>
</table>

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<ol>
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</ol>

<h2>Practice Problems</h2>
<ol>
```

```
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<li>Create a None variable and check its type.</li>
<li>Demonstrate dynamic typing with a variable.</li>
</ol>
"""
```

```
story.append(Paragraph(content, styles["Normal"]))
```

```
doc = SimpleDocTemplate(file_path, pagesize=A4)
doc.build(story)
```

```
file_path
```

Result

```
'/mnt/data/Variables_DataTypes_Python_Notes.pdf'
```

✅ Your PDF is ready!

📄 **Download here:**

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If you want, I can also create an **expanded version** with:

- ✅ Line-by-line 📘 explanation of **every concept**
- ✅ Word-by-word breakdown
- ✅ 50 MCQs
- ✅ More interview questions
- ✅ More practice questions with solutions
- ✅ Diagrams & examples

Just tell me **"Make full detailed PDF"** and I will prepare the complete version. </>



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It looks like your last message only contains a **backtick** (```).

Do you want to:

- Paste some code?
- Start a new question?
- Fix an error?
- Continue with the Variables & Data Types explanation?

Just send it again — I'm here!



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Below is the **complete, detailed, word-by-word, line-by-line** explanation of everything you wrote — **variables, data types, interview questions, and practice problems.**

✅ Variables & Data Types in Python — Complete Explanation (Line-by-Line & Word-by-Word)

◆ “Variables & Data Types in Python - Complete Notes”

➡ This is the title.

- **Variables** = names used to store data.
- **Data Types** = categories that tell Python what kind of data is being stored.
- **Complete Notes** = everything is covered in detail.

◆ “This PDF contains table format notes, interview questions, and practice problems on Python variables and data types.”

This sentence describes what the notes include:

- **table format notes** → data types are organized in table form
- **interview questions** → common questions asked in Python interviews
- **practice problems** → programming exercises
- **variables and data types** → the main topic

✅ TABLE EXPLANATION (Line-by-Line & Word-by-Word)

You wrote:

powershell

📄 Copy code

Data Type	Description	Example
-----------	-------------	---------

This means the table has 3 columns:

1. **Data Type** → name of the type
2. **Description** → what that data type means
3. **Example** → Python example of using that type

Now each row:

✅ int — Whole numbers — `x = 10`

- **int** → stands for *integer*, numbers without decimal
- **Whole numbers** → 0, 1, -1, 20, etc.
- `x = 10` →
 - `x` = variable name
 - `=` = assignment operator
 - `10` = integer value

✅ float — Decimal numbers — `pi = 3.14`

- **float** = floating-point number
- **Decimal numbers** → numbers with decimal part: 2.5, 7.9
- `pi = 3.14` →

- **pi** variable
 - **3.14** float value
-

✓ **bool** — True/False — **flag = True**

- **bool** = boolean
 - Only **two possible values** → True Or False
 - **flag = True**
 - **flag** variable
 - **True** boolean value
-

✓ **str** — Text — **name = 'Aamir'**

- **str** = string, sequence of characters
 - **Text** → letters, words, sentences
 - **name = 'Aamir'**
 - **'Aamir'** is a string enclosed in quotes
-

✓ **list** — Mutable sequence — **[1, 2, 3]**

- **list** = ordered collection
 - **Mutable** → can change values
 - Example → **[1, 2, 3]**
-

✓ **tuple** — Immutable sequence — **(1, 2, 3)**

- **tuple** = ordered like list
 - **Immutable** → cannot change values
 - **(1, 2, 3)** = tuple
-

✓ **dict** — Key-value pairs — **{'a': 1}**

- **dict** = dictionary
- Stores data in **key** → **value** format
- **{'a': 1}**
 - **key = 'a'**

- `value = 1`

✓ **set — Unique unordered values — {1, 2, 3}**

- **set** = collection of unique items
- **unordered** → no fixed index
- Example → {1, 2, 3}

✓ **NoneType — Represents no value — `x = None`**

- **NoneType** = type of `None`
- **None** = absence of a value
- `x = None` → variable with no value assigned

✓ **INTERVIEW QUESTIONS (Explained Line-by-Line)**

1 **What is a variable in Python?**

A variable is a name that stores data.

2 **What is dynamic typing?**

Python automatically decides data type at runtime.

3 **Difference between mutable and immutable?**

- **Mutable** → can be changed (list, dict, set)
- **Immutable** → cannot be changed (tuple, str, int)

4 **What are Python data types?**

int, float, bool, str, list, tuple, dict, set, NoneType.

5 **What is None in Python?**

Represents no value; type is NoneType.

6 **Difference between list and tuple?**

- **list** → mutable, `[]`
- **tuple** → immutable, `()`

7 **How do you check the type of a variable?**

Using: `type(variable)`

8 What is a dictionary?

Key-value data structure.

9 What is type casting?

Converting one data type to another.

10 Explain Python's memory model for variables.

Variables are references to objects stored in memory.

✓ PRACTICE PROBLEMS (Explained One-by-One)

1 Create variables of all data types and print their types.

You must use `type()`

2 Convert a string '100' into int and float.

Use `int('100')` and `float('100')`

3 Write a program to swap two variables.

Method: `x, y = y, x`

4 Create a list and modify its values. Can you modify a tuple?

- list → yes
- tuple → no

5 Create a dictionary for a student with 3 key-value pairs.

Example:

```
student = {"name": "Aamir", "age": 20, "grade": "A"}
```

6 Convert a list to a set. What changes?

Duplicates removed; order lost.

7 Write code to check mutability of list vs tuple.

Try modifying both.

8 Create a complex number and print its real and imaginary parts.

```
z = 3 + 5j  
z.real, z.imag
```

9 Create a None variable and check its type.

```
x = None  
type(x)
```

10 Demonstrate dynamic typing.

Same variable can store different types.

✓ If you want, I can create:

- 📄 A detailed PDF (fully styled, clean design)
- 📄 With tables, explanations, code, outputs, diagrams, MCQs

Just say:

👉 "Make full detailed PDF"