

1. INTRODUCTION

PyPLAS (Python Programming Learning Assistant System) is an application designed to support Python programming learning. This system has the following features:

- **Automatic Grading Function:** Supports both multiple-choice and coding problems.
- **Interactive Execution Environment:** Allows learning while executing code directly.
- **Progress Management:** Tracks progress in problem-solving and records results.

2. HOW TO LEARN WITH PYPLAS

Follow these steps to use PyPLAS effectively:

① Select a Category

In PyPLAS, problems are grouped into **categories**. Select a category of interest from the top page.

② Choose a Problem

Clicking on a category will display a list of problems available for study. The list also shows the progress status for each problem. (**FIGURE 1**)

📖 Problems		
#	title	progress
0	pandas基礎構文1	🔴 未学習
1	pandas基礎構文2	🟡 学習中
2	機械学習プログラミングの流れ	🟢 完了
3	scikit-learn基礎構文	🟡 学習中
4	モデルの検証とハイパーパラメータの決定	🟢 完了
5	【Extra】手書き文字の認識	🔴 未学習

Figure 1: Problem (Progress) List

③ Solve the Problem

Refer to **Section 4: How to Solve Problems** for detailed instructions on solving problems.

④ Obtain the Answer Log

Once all problems in the category are solved, return to the problem list screen. (**FIGURE 2**)

Enter your student ID and name, then click "**Download**" to download the answer log file.

Problems

#	title	progress
0	pandas基礎構文1	完了
1	pandas基礎構文2	完了
2	機械学習プログラミングの流れ	完了
3	scikit-learn基礎構文	完了
4	モデルの検証とハイパーパラメータの決定	完了
5	【Extra】手書き文字の認識	未学習

Log

Student ID

50M*****

① Enter your student ID

Input your student ID.

Name

山田太郎

② Enter your name

Input your Name.

Download

③ Click 'Download'

Figure 2: Downloading the Log File

⑤ Submit the Answer Log

Submit the downloaded log file to the designated location.

3. HOW TO USE THE UI

PyPLAS Python Programming Learning Assistant System

Home My Category

Operations

Execute All

Restart Kernel

Interrupt Kernel

Save Answer

User's Guide

Home

How to Use PyPLAS (JP)

How to Use PyPLAS (EN)

The Use of OSS in PyPLAS

Source Code (Github)

pandas基礎構文1

Summary

Data Source

Environment

pandasについて以下のことを学ぶ。

- pandasとは
- データ構造
- 基礎構文

The Source Code

pandasとは？

pandasは、機械学習プログラミングでよく使われるライブラリです。機械学習においてpandasがよく使われる理由は、データの処理や解析を効率的に行えるためです。pandasは、表形式のデータを扱うのに非常に適したライブラリであり、データの読み込みから加工、分析までを簡単かつ直感的に行うことができます。たとえば、データセットに欠損値が含まれている場合、それを見つけて補完したり削除したりする操作を容易に行えます。

ここでは、pandasの特徴的なデータ構造や基礎的な構文について学びます。

```

1 # pandasをインポート
2 import pandas as pd
3

```

pandasは慣習的にpdとしてインポートされます。

Category:

【12月】技術英語

Questions

Q. 1 Complete

Q. 2 Complete

Q. 3 Complete

Inner Link

pandasとは？

- pandasのデータ構造
 - pd.Series
 - pd.DataFrame
 - SeriesとDataFrameの違い
- pandas基礎構文
 - データの読み込み
 - DataFrameの情報を取得
 - 列・行の選択
 - 欠損値の処理

Figure 3: Overview of the Problem Page

① Operation Menu

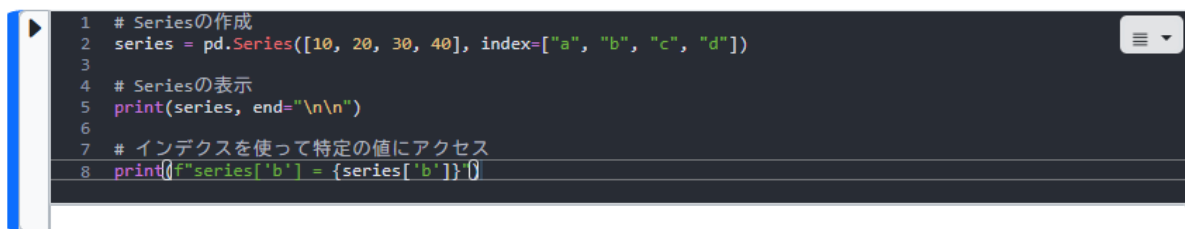
- *Execute All* : Runs all code blocks.
- *Restart Kernel* : Resets the execution environment.
- *Interrupt Kernel* : Stops the currently running process.
- *Save Answer* : Saves the answer.

② Header

- *Summary* : Overview of the learning content on the page.
- *Data Source* : Links to datasets used on the page and reference materials.
- *Environment* : Information about the execution environment (Python version, installed packages, etc.).

③ The Source Code

- **Code ブロック** : Demonstration code for checking program behavior. ([FIGURE 4](#))
 - ✓ Click the ▶ button on the left to execute the code.



```
1 # Seriesの作成
2 series = pd.Series([10, 20, 30, 40], index=["a", "b", "c", "d"])
3
4 # Seriesの表示
5 print(series, end="\n\n")
6
7 # インデックスを使って特定の値にアクセス
8 print(f"series['b'] = {series['b']}")
```

Figure 4: Code Block

- **Question ブロック** : A test to assess the learner's understanding.

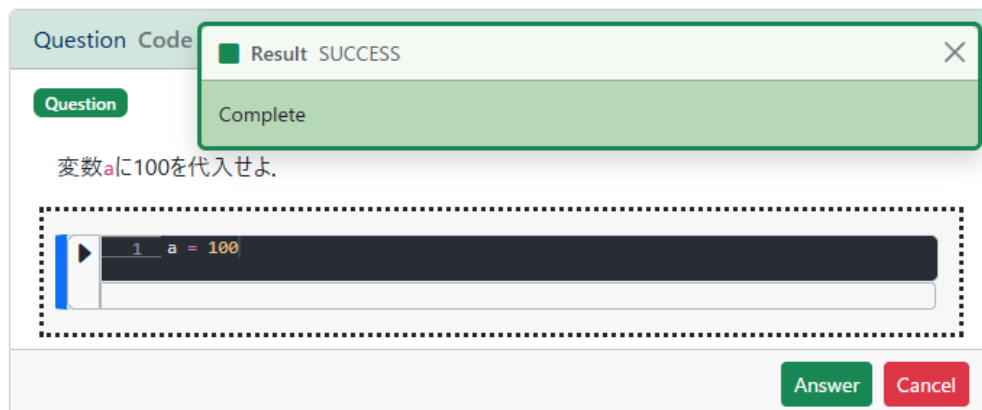


Figure 5: Question Block for Code Test (Correct Answer)

- ✓ There are two types of question blocks:
 - *Word Test*: Multiple-choice or fill-in-the-blank questions.
 - *Code Test*: Requires writing code that meets certain conditions and executing it.
- ✓ Click the "**Answer**" button to check your answer.
- ✓ Click the "**Cancel**" button to stop the grading process (Code Test only).

4. HOW TO SOLVE PROBLEMS

Follow these steps when answering questions:

1. Check the Header

Read the Summary to understand the learning objectives of the page.

2. Run the Source Code

Execute the **Code Block** while reading the explanations to check how the program works.

Note: Modifying the code content does not affect the problem itself.

3. Work on the Question

- In Code Tests, some parts of the code may already be provided. Complete the missing parts if necessary. **After writing the code, it is recommended to run each code block once to ensure there are no errors before clicking the Answer button.**
- If the answer does not meet the conditions, an error message will be displayed.

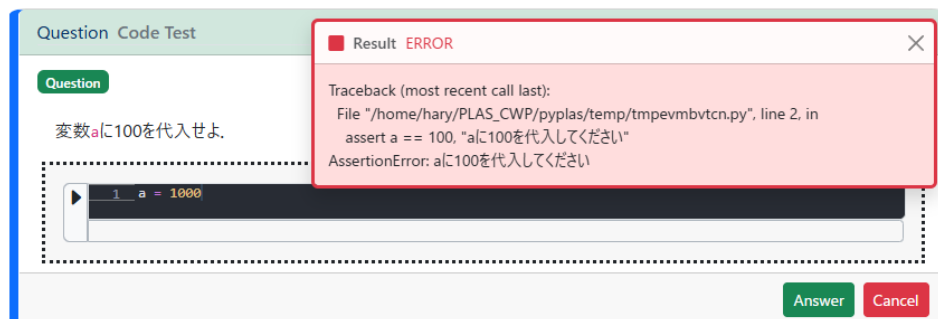


Figure 6: Question Block (Incorrect Answer)

IMPORTANT NOTES

- **Recommended Browsers:** Google Chrome, Microsoft Edge.
- Do not solve multiple problems simultaneously in different tabs.