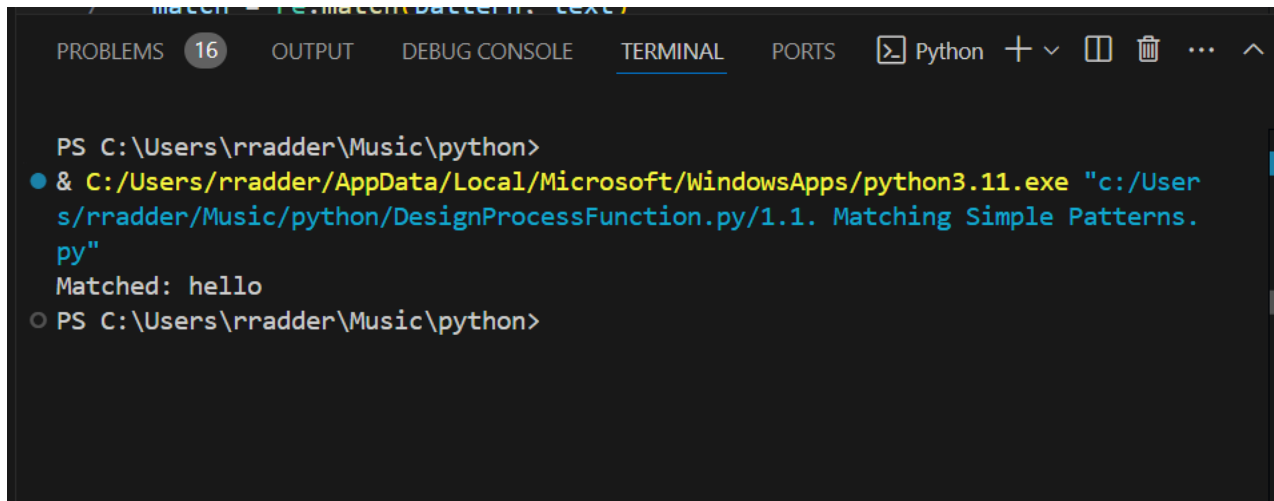


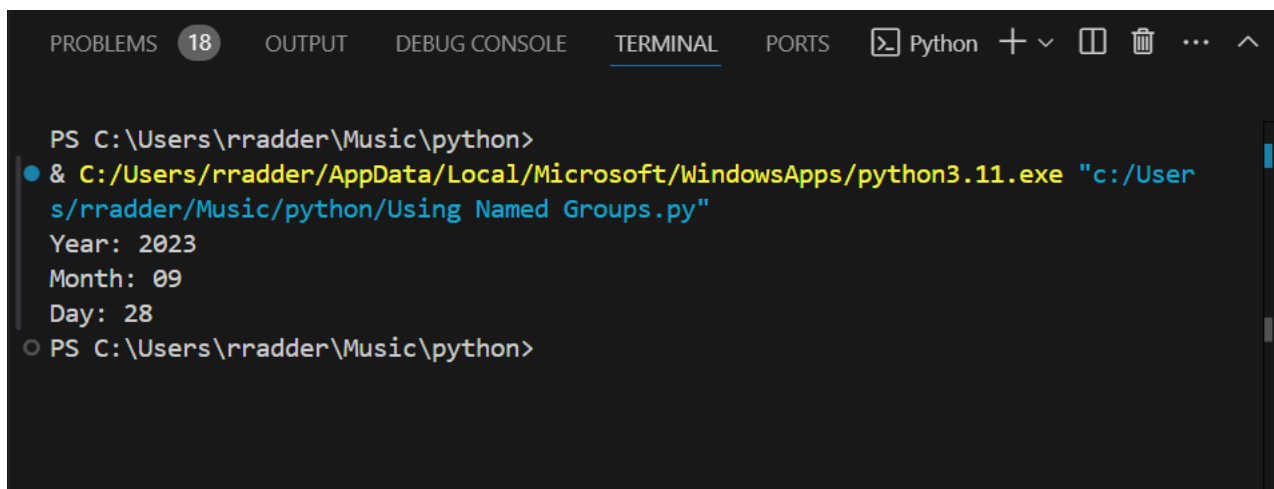
1.1. Matching Simple Patterns



A screenshot of a Visual Studio Code terminal window. The terminal title bar shows 'PROBLEMS' (16), 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL' (selected), 'PORTS', and a 'Python' icon. The terminal content shows a PowerShell prompt 'PS C:\Users\rradder\Music\python>' followed by a command to run a Python script: '& C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/DesignProcessFunction.py/1.1. Matching Simple Patterns.py"'. The output of the script is 'Matched: hello'. The prompt returns to 'PS C:\Users\rradder\Music\python>'.

```
PS C:\Users\rradder\Music\python>
• & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/DesignProcessFunction.py/1.1. Matching Simple Patterns.py"
Matched: hello
○ PS C:\Users\rradder\Music\python>
```

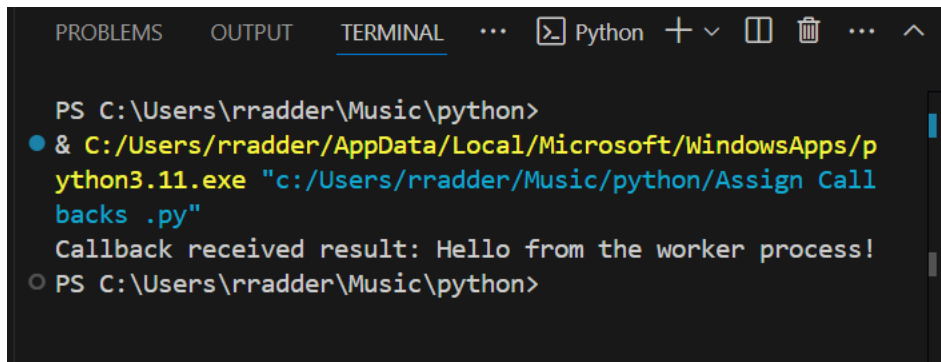
2.1 PNG



A screenshot of a Visual Studio Code terminal window. The terminal title bar shows 'PROBLEMS' (18), 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL' (selected), 'PORTS', and a 'Python' icon. The terminal content shows a PowerShell prompt 'PS C:\Users\rradder\Music\python>' followed by a command to run a Python script: '& C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Using Named Groups.py"'. The output of the script is 'Year: 2023', 'Month: 09', and 'Day: 28'. The prompt returns to 'PS C:\Users\rradder\Music\python>'.

```
PS C:\Users\rradder\Music\python>
• & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Using Named Groups.py"
Year: 2023
Month: 09
Day: 28
○ PS C:\Users\rradder\Music\python>
```

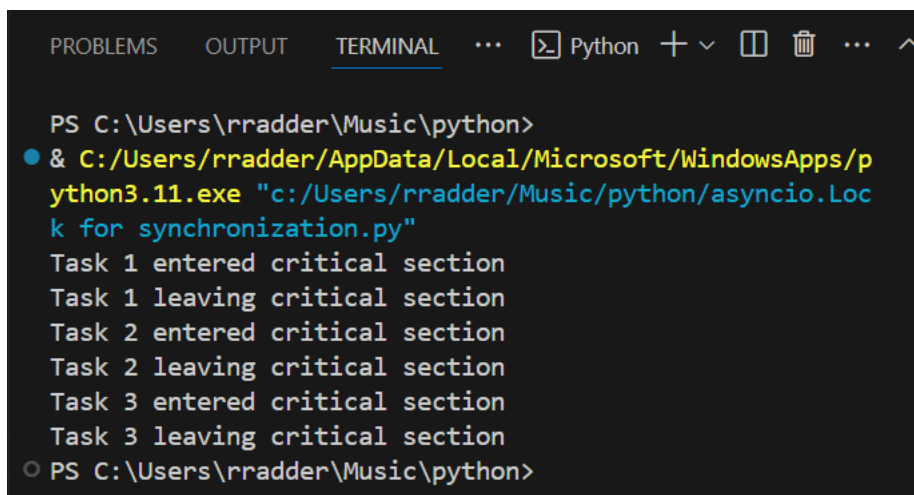
Assign Callbacks



```
PROBLEMS  OUTPUT  TERMINAL  ...  Python  +  -  [ ]  [X]  ...  ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Assign Callbacks .py"
  Callback received result: Hello from the worker process!
○ PS C:\Users\rradder\Music\python>
```

asyncio.Lock for synchronization



```
PROBLEMS  OUTPUT  TERMINAL  ...  Python  +  -  [ ]  [X]  ...  ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/asyncio.Lock for synchronization.py"
  Task 1 entered critical section
  Task 1 leaving critical section
  Task 2 entered critical section
  Task 2 leaving critical section
  Task 3 entered critical section
  Task 3 leaving critical section
○ PS C:\Users\rradder\Music\python>
```

BeautifulSoupPNG

```
PROBLEMS 16 OUTPUT TERMINAL ... Python + - [] ...  
  
PS C:\Users\rradder\Music\python>  
⊗ & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/DesignProcessFunction.py/Parsing with BeautifulSoup.py"  
File "c:\Users\rradder\Music\python\DesignProcessFunction.py\Parsing with BeautifulSoup.py", line 19  
XML Parsing:  
^^^^^^  
SyntaxError: invalid syntax  
○ PS C:\Users\rradder\Music\python>
```

Compiling Regular Expressions

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [] ... ^  
  
PS C:\Users\rradder\Music\python>  
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Compiling Regular Expressions.py"  
Matches: ['3', '10']  
○ PS C:\Users\rradder\Music\python>
```

Complex Patterns

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [] [X] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Complex Patterns.py"
Year: 2023
Month: 09
Day: 28
Updated text: The year is 2024
○ PS C:\Users\rradder\Music\python>
```

Co-routine & Tasks

```
PROBLEMS OUTPUT TERMINAL ... Python + - [] [X] ... ^

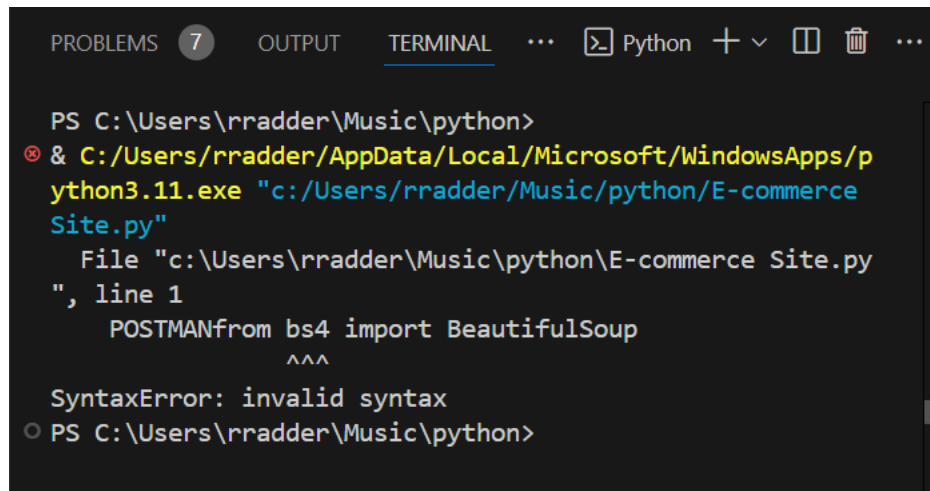
PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Co-routine & Tasks"
Task 1 started
Task 2 started
Task 2 completed
Task 1 completed
○ PS C:\Users\rradder\Music\python>
```

Designing the Process Functions & Passing Arguments, Return Values

```
PROBLEMS OUTPUT TERMINAL ... Python + - [] [X] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/rradder/Music/python/DesignProcessFunction.py/designProcessFunction.py
The square of 5 is 25
○ PS C:\Users\rradder\Music\python>
```

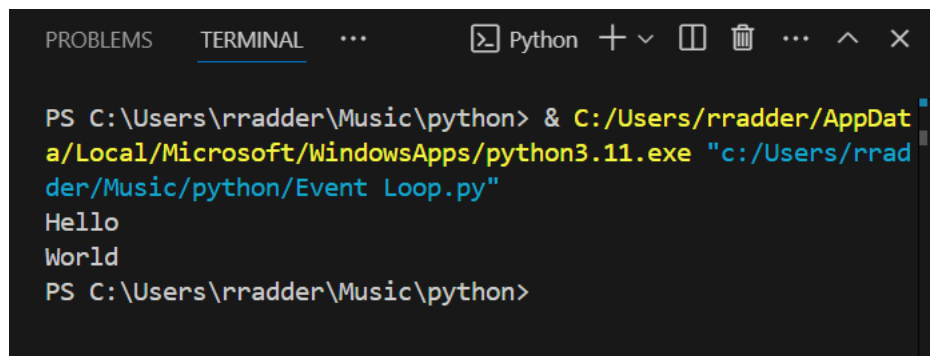
E-commercePNG



A screenshot of a Windows command prompt window. The title bar shows 'Python' and standard window controls. The terminal shows a command to run a Python script, which fails with a syntax error. The error message indicates an 'invalid syntax' at line 1, specifically with the line 'POSTMANfrom bs4 import BeautifulSoup'. The prompt is 'PS C:\Users\rradder\Music\python>'.

```
PS C:\Users\rradder\Music\python>
& C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/E-commerce Site.py"
File "c:\Users\rradder\Music\python\E-commerce Site.py", line 1
    POSTMANfrom bs4 import BeautifulSoup
            ^^^
SyntaxError: invalid syntax
PS C:\Users\rradder\Music\python>
```

Event Loop



A screenshot of a Windows command prompt window. The title bar shows 'Python' and standard window controls. The terminal shows a command to run a Python script, which executes successfully, printing 'Hello' and 'World'. The prompt is 'PS C:\Users\rradder\Music\python>'.

```
PS C:\Users\rradder\Music\python> & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Event Loop.py"
Hello
World
PS C:\Users\rradder\Music\python>
```

File Handling

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [X] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/File Handling.py"
File Content:
Hello, world!
Welcome to Python file handling.
○ PS C:\Users\rradder\Music\python>
```

Futures & Synchronization

```
PROBLEMS OUTPUT TERMINAL ... Python + - [ ] [X] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/p
ython3.11.exe "c:/Users/rradder/Music/python/Futures & S
ynchronization"
Producing result...
Waiting for result...
Received: Result produced
○ PS C:\Users\rradder\Music\python>
```

Inter-Process Communication

```
PROBLEMS  OUTPUT  TERMINAL  ... Python + - [ ] [ ] ... ^

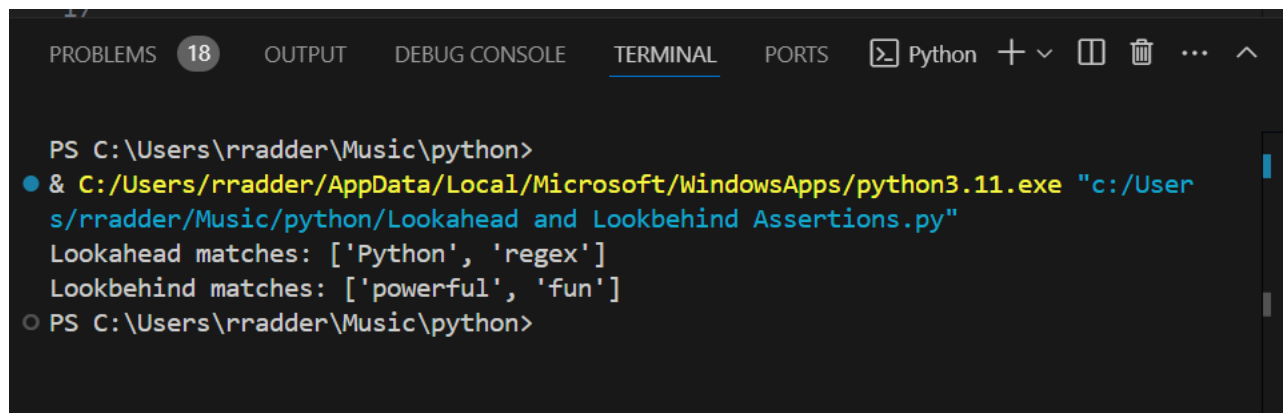
PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/DesignProcessFunction.py/Inter-Process Communication.py"
Consumed: 0
Consumed: 1
Consumed: 2
Consumed: 3
Consumed: 4
○ PS C:\Users\rradder\Music\python>
```

JSONPNG

```
PROBLEMS  16  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  Python + - [ ] [ ] ... ^

ssFunction.py/JSON Parser.py"
JSON String:
{
  "name": "John",
  "age": 30,
  "city": "New York",
  "is_student": false,
  "courses": [
    "Python",
    "JavaScript"
  ]
}
Data Loaded from File:
{'name': 'John', 'age': 30, 'city': 'New York', 'is_student': False, 'courses': ['Python', 'JavaScript']}
Data Loaded from String:
{'name': 'John', 'age': 30, 'city': 'New York', 'is_student': False, 'courses': ['Python', 'JavaScript']}
○ PS C:\Users\rradder\Music\python>
```

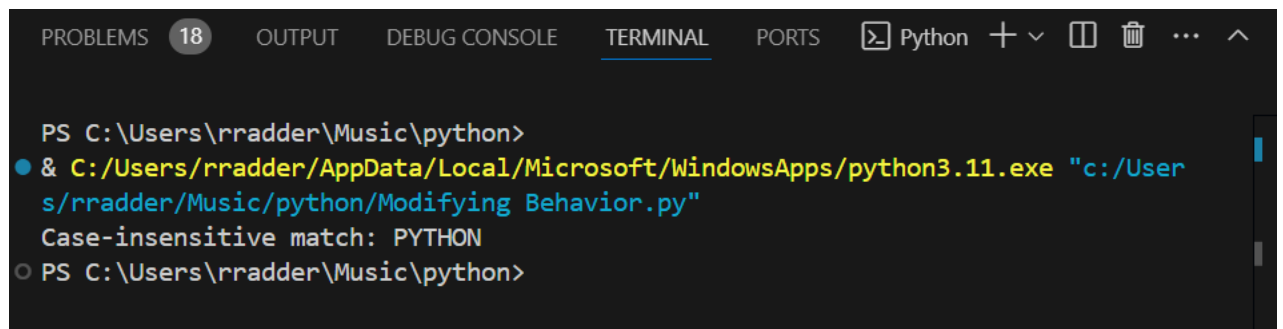
Lookahead and Lookbehind AssertionsPNG



```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [X] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/Lookahead and Lookbehind Assertions.py"
Lookahead matches: ['Python', 'regex']
Lookbehind matches: ['powerful', 'fun']
○ PS C:\Users\rradder\Music\python>
```

Modifying BehaviorPNG



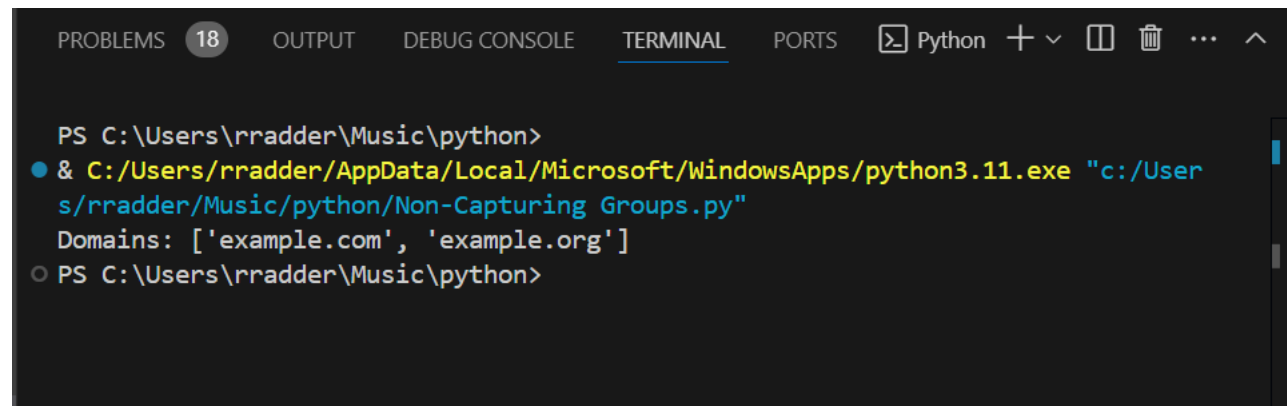
```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [X] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/Modifying Behavior.py"
Case-insensitive match: PYTHON
○ PS C:\Users\rradder\Music\python>
```

Module


```
Assign Callbacks .py
asyncio.Lock for synchronizatio
asyncio.Lock for synchronization.py
Co-routine & Tasks
Compiling Regular Expressions.py
Complex Patterns.py
data.json
DesignProcessFunction.py
E-commerce Site.py
Event Loop.py
Futures & Synchronization
Lookahead and Lookbehind Assertions.py
Modifying Behavior.py
module.py
Non-Capturing Groups.py
Non-Greedy Matching.py
POSTMAN.py
Replace Patterns.py
Requests Module.py
Searching Anywhere in the String.py
Split Strings.py
sys Module.py
Using Named Groups.py
Using Non-Capturing Groups.py
webspring.py
Directory 'test_directory' created
Directory 'test_directory' removed
PS C:\Users\rradder\Music\python>
```

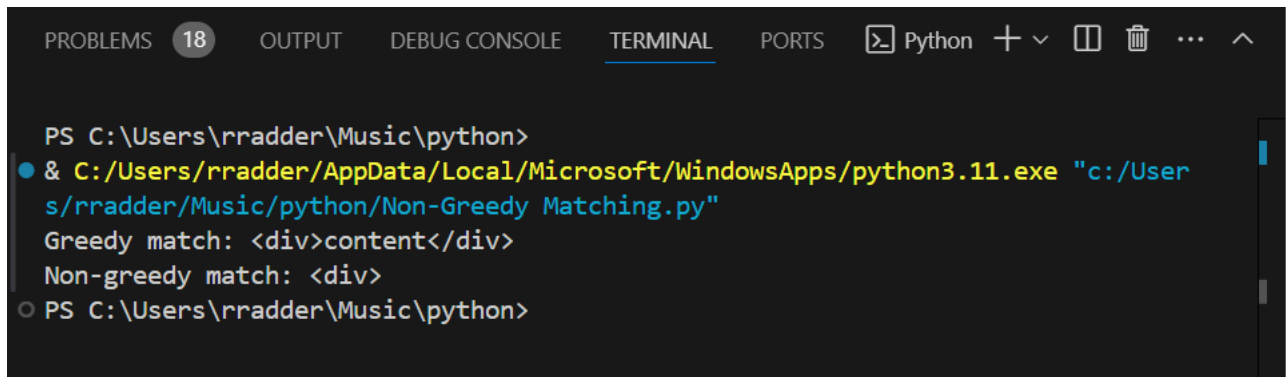
Non-Capturing Groups



The screenshot shows a VS Code interface with a terminal window open. The terminal displays the execution of a Python script named 'Non-Capturing Groups.py'. The command executed is `& C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/Non-Capturing Groups.py"`. The output of the script is `Domains: ['example.com', 'example.org']`. The terminal prompt is `PS C:\Users\rradder\Music\python>`.

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [X] ... ^
PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/Non-Capturing Groups.py"
Domains: ['example.com', 'example.org']
○ PS C:\Users\rradder\Music\python>
```

Non-Greedy Matching

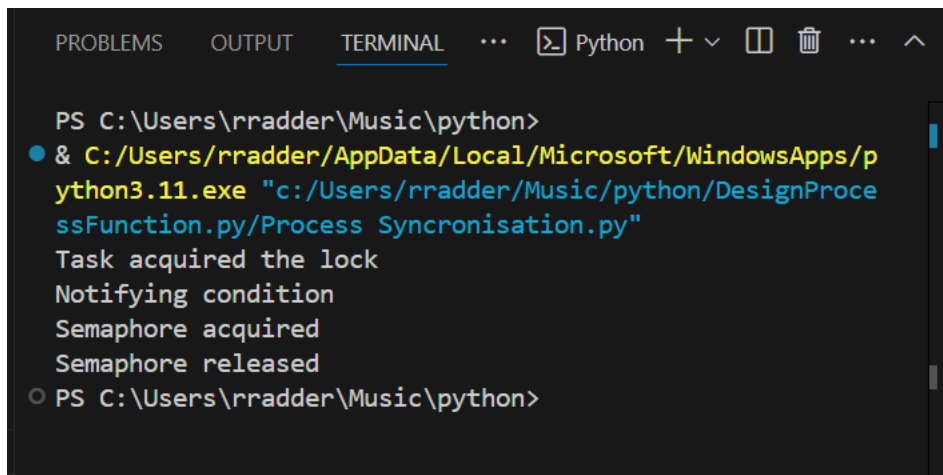


The screenshot shows a Windows terminal window with the following content:

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + v [icon] [icon] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/Non-Greedy Matching.py"
Greedy match: <div>content</div>
Non-greedy match: <div>
○ PS C:\Users\rradder\Music\python>
```

Process Synchronization – Mutex, Condition, Semaphores



The screenshot shows a Windows terminal window with the following content:

```
PROBLEMS OUTPUT TERMINAL ... Python + v [icon] [icon] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/p
ython3.11.exe "c:/Users/rradder/Music/python/DesignProce
ssFunction.py/Process Synchronisation.py"
Task acquired the lock
Notifying condition
Semaphore acquired
Semaphore released
○ PS C:\Users\rradder\Music\python>
```

ProcessPoolPNG

```
PROBLEMS OUTPUT TERMINAL ... Python + - [ ] [ ] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/rradder/Music/python/DesignProcessFunction.py/Process_Pool.py
Results: [1, 4, 9, 16, 25]
○ PS C:\Users\rradder\Music\python>
```

time Module&datetime Module

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [ ] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/rradder/Music/python/pickle Module.py"
Loaded Data: {'name': 'John', 'age': 30, 'city': 'New York'}
Current Date and Time: 2024-10-04 20:22:53.936381
Formatted Date and Time: 2024-10-04 20:22:53
Future Date (after 5 days): 2024-10-09 20:22:53.936381
○ PS C:\Users\rradder\Music\python>
```

Using Non-Capturing Groups

```
PROBLEMS 18 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [ ] ... ^

PS C:\Users\rradder\Music\python>
● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/Using Non-Capturing Groups.py"
Year: 2023
Month: 09
Day: 28
○ PS C:\Users\rradder\Music\python>
```

Using re, numpy, and pandas Modules

```
PROBLEMS 20 OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] [ ] ... ^

PS C:\Users\rradder\Music\python>
⊗ & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/User
s/rradder/Music/python/Using re, numpy, and pandas Modules.py"
Prices found: ['$25.99']
Updated Text: The price of the product is $29.99 and the discount is 10%.
Traceback (most recent call last):
  File "c:\Users\rradder\Music\python\Using re, numpy, and pandas Modules.py",
    line 17, in <module>
      import numpy as np
ModuleNotFoundError: No module named 'numpy'
○ PS C:\Users\rradder\Music\python>
```

UsingPipePNG

PROBLEMS

OUTPUT

TERMINAL

...

Python

+ v

□

🗑

...

^

PS C:\Users\rradder\Music\python>

● & C:/Users/rradder/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/rradder/Music/python/DesignProcessFunction.py/Usingpipe.py

Received message: Hello from sender!

○ PS C:\Users\rradder\Music\python>