

## Report: Out of Memory Error

### Overview

The purpose of this Python program is to simulate an out-of-memory condition by gradually consuming memory until a specified memory limit is reached. The program utilizes the `psutil` library to monitor memory usage and ensures controlled memory allocation.

### Program Details

- Memory Consumption Function:
  - The program defines a function called `consume\_memory(target\_memory\_mb)` responsible for gradually allocating memory until the specified memory limit is reached.
  - `target\_memory\_mb` is a configurable parameter that sets the desired memory limit in megabytes (MB).
- Memory Allocation Process:
  - Inside the `consume\_memory` function, a list named `memory\_hog` is used to hold memory chunks.
  - The program enters a loop that attempts to allocate memory in 1 MB chunks (1 MB = 1024 KB = 1024 \* 1024 bytes).
  - With each successful memory allocation, a chunk of 1 MB is appended to the `memory\_hog` list, and the total allocated memory in MB is updated.
- Out-of-Memory Handling:
  - If the total allocated memory exceeds the specified `target\_memory\_mb`, the loop terminates.
  - If an out-of-memory condition occurs before reaching the target limit, the program catches the `MemoryError` exception and prints a message indicating how much memory was allocated before running out of memory.
- Execution:
  - The program's execution begins in the `if \_\_name\_\_ == "\_\_main\_\_":` block.
  - The user can set the `target\_memory\_mb` variable to specify the desired memory limit.

- By adjusting this variable, users can simulate various levels of memory usage.

## Conclusion

This Python program offers a controlled and efficient way to simulate out-of-memory conditions. By using the `psutil` library for monitoring memory usage, it ensures that memory consumption is tracked accurately. The ability to configure the target memory limit allows users to tailor the simulation to their specific needs, making it a valuable tool for testing and understanding memory management in Python applications.

## Screenshot

The screenshot displays a Visual Studio Code (VS Code) editor window with a dark theme. The Explorer sidebar on the left shows a project structure under 'CLASS-ASSIGNMENTS' with files like 'outOfMemory.py' and 'process.py'. The main editor area shows the code for 'outOfMemory.py'. The code includes imports for 'os', 'datetime', and 'getpass', a function 'print\_system\_info()' to display system details, and a function 'simulate\_out\_of\_memory()' that attempts to allocate a large amount of memory to trigger a 'MemoryError'. The terminal at the bottom shows the execution output, including the system information and the 'MemoryError' message.

```

1  import os
2  import datetime
3  import getpass
4
5  def print_system_info():
6      # Get user data
7      os.system('clear') # os.system('clear') for Linux
8      username = getpass.getuser()
9      # Get computer information
10     computer_info = os.name
11     # Get current date and time
12     current_time = datetime.datetime.now()
13     # Format log message
14     log_message = f"User: {username}\nTime:{current_time}\nComputer Info: {com
15     # Print log message
16     print(log_message)
17
18 # Call the function to print the log
19 print_system_info()
20
21 import sys
22
23 def simulate_out_of_memory():
24     while True:
25         # try:
26         # Allocate a large amount of memory
27         memory = [0] * sys.maxsize
28         # except MemoryError:
29         #     print("Out of memory")
30         #     break
31
32 simulate_out_of_memory()

```

Terminal Output:

```

User: harshsiddhapura
Time:2023-09-23 13:31:30.633244
Computer Info: posix
Traceback (most recent call last):
  File "/Users/harshsiddhapura/Harsh/Education/MS_IT/Sem-1/IFT510 - Architecture /Class-Assignments/outOfMemory/outOfMemory.py", line 32, in <module>
    simulate_out_of_memory()
  File "/Users/harshsiddhapura/Harsh/Education/MS_IT/Sem-1/IFT510 - Architecture /Class-Assignments/outOfMemory/outOfMemory.py", line 27, in simulate_out_of_memory
    memory = [0] * sys.maxsize
MemoryError
(.venv) harshsiddhapura@Harshs-MacBook-Air outOfMemory %

```