



# DEPARTMENT OF SOFTWARE TECHNOLOGY

#### **CSOPESY Seatwork**

Instructor: Neil Patrick Del Gallego, Ph.D.

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SECTION:	S18
DATE OF SEATWORK	May 17, 2025

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#include <vector> class Process { Process(int pid, const std::vector<std::string>& instructions); Copilot Chat 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 **25** 26 27 int getPID() const;
const std::string& getName() const; I might make mistakes, so check for accuracy. int getCurrentInstructionIndex() const;
void step(); **⊠** Summarize my code bool isFinished() const; void printCurrentInstruction() const; int pid;
std::string name;
std::vector<std::string> instructions;
int currentInstructionIndex; + [D] Active Document X ☐ GPT-4.1 → Activate Windows Ln: 25 Ch: 1 SPC CRLF GitHub Cobilot Chac โร่งเกตเล็ก Exployer tedil/Civalnoves ↑ Add to Source Control 🔺 🖽 Select Repository 🔺 🥠 🔚 🟗 💁 🥋 🦃 😕 9:31 am 

## Description of Attributes:

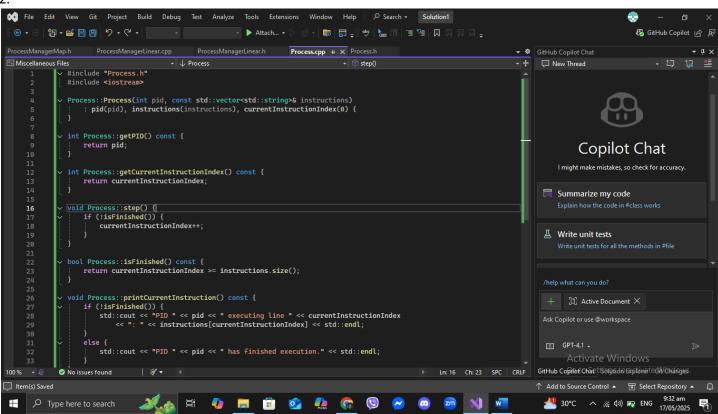
- pid: Unique process ID
- name: Optional process name
- instructions: A list of instruction lines

currentInstructionIndex: Tracks the line being executed

## **Key Functions:**

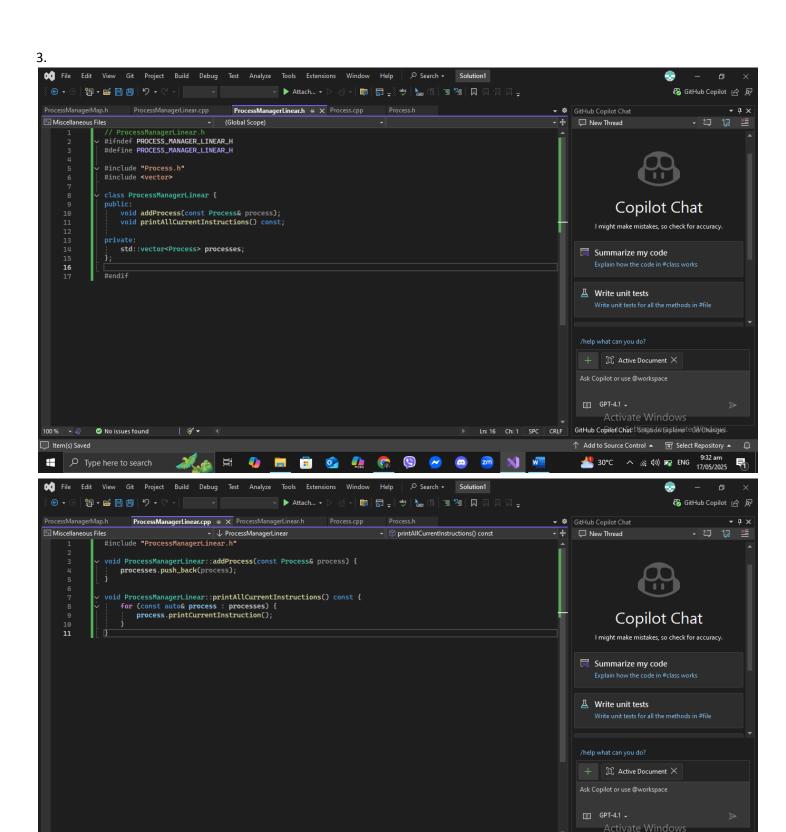
- Constructor initializes the process with an ID and its instructions.
- step() advances the process to the next instruction.
- isFinished() checks if the process completed all instructions
- printCurrentInstruction() prints the instruction currently being executed.

2.



#### **Explanation:**

- step(): Moves the process forward by incrementing the instruction index, simulating execution of the next line.
- isFinished(): Returns true if the process has executed all instructions.
- **printCurrentInstruction():** Prints the current instruction being executed, along with the process ID and line number. If all instructions have been executed, it prints a finished message.



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# **Explanation:**

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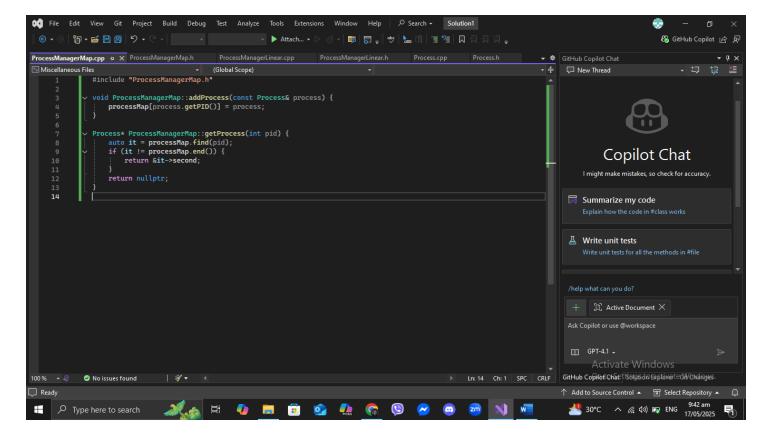
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• Purpose: Manage multiple processes and allow iterating over them sequentially.

Data Structure: Uses a std::vector<Process> to store processes.

- addProcess(): Adds a new process to the vector.
- printAllCurrentInstructions(): Iterates over all processes and prints each process's current instruction.
- **Traversal:** Since it uses a vector, iterating through all processes is done in linear time O(N), where N is the number of processes.

4. 📢 File Edit View Git Project Build Debug Test Analyze Tools Extensions Window Help 🔎 Search 🕶 Solution1 ⑥ • ◎ | \*\* • ≧ □ □ | り • ○ • | □ □ ▼ □ -- ▶ Attach... • ▷ ૭ • | 📭 | 🚮 😜 💖 | 🔚 偱 | ء 🧏 🔲 🔘 🗑 🦏 🥡 ProcessManagerMap.h → X ProcessManagerLinear.cpp ▼ □ GitHub Copilot Chat v #ifndef PROCESS\_MANAGER\_MAP\_H
#define PROCESS\_MANAGER\_MAP\_H #include <unordered\_map> void addProcess(const Process& process); Copilot Chat Process\* getProcess(int pid); I might make mistakes, so check for accuracy. std::unordered\_map<int, Process> processMap;
}; Summarize my code + [1] Active Document X Ask Copilot or use @workspace **Activate Windows** Ln: 5 Ch: 24 SPC CRLF GitHub Copilot Chartisolytida Explorer tedit/Changes 100 % - 🔊 🕝 No issues found ↑ Add to Source Control 🔺 🎹 Select Repository 🔺 🚨 Ready 



# **Explanation:**

- **Purpose:** Store processes in a hash map for fast retrieval by pid.
- Data Structure: std::unordered\_map<int, Process> maps pid (key) to Process object (value).
- addProcess(): Inserts or updates the process associated with the given PID.
- **getProcess():** Retrieves a pointer to the process with the given PID in **constant time O(1)**. Returns nullptr if no such process exists.
- Benefit: This is more efficient when you want to directly access a process without iterating over the entire list.

#### References:

https://en.cppreference.com/w/

https://www.w3schools.com/cpp/default.asp

https://cplusplus.com/reference/