

DF-Assignment

Done By:
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Reflection on Cache Memory

In this project, the concepts of cache memory have been implemented through the use of Python and basic software logic. Cache blocks, cache hits, cache misses and replacement algorithms, among other things, have been expressed using **Python's built-in list data structure, loops and conditional statements**. The FIFO replacement algorithm was used and implemented by keeping track of the elements in the cache to know the order, so that when the cache gets full, it could be emptied of the oldest block(s). By using this method, the functional concept of how cache memory works in a Computer System was understood in a real world way.

While working with a team of five people to develop the project, **GIT was an extremely important asset for version management** due to the nature of working in a team. Each person worked on a different part of the project, so keeping track of who was doing what would have been very difficult if not for GIT, it also allowed us to push our own individual parts, as well as pull updates from the others, while at the same time keeping the project organized and coordinated. Commands such as pull, commit and push allowed us to stay in sync and avoid problems that could arise while working together.

The most difficult and challenging part of the project was the coding aspect. To turn the theoretical concepts of cache memory into Python Logic required a lot of careful planning and logical reasoning. Debugging the errors took quite a bit of time; however, I was able to improve my understanding of the cache memory concepts and how they work in a Computer System. All in all, this project was a great learning experience for me in terms of cache memory, Python programming, and teamwork while using GIT.

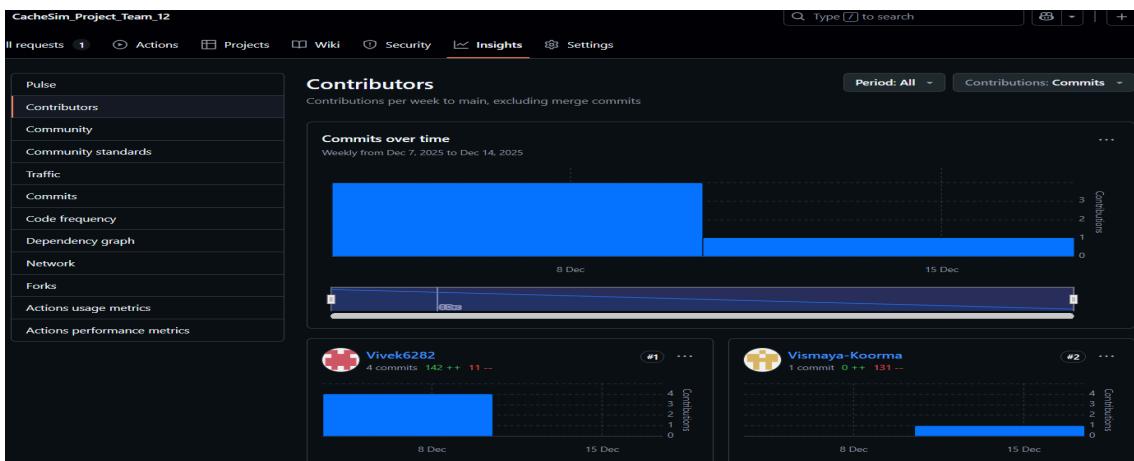
Assignment Activities and Contribution

1) Git log

The screenshot shows a list of commits from the user 'vivek(Fifo)'. The commits are organized by date: Dec 14, 2025; Dec 13, 2025; and Dec 9, 2025. Each commit includes a message, the author (Vivek6282), the commit time, and the commit hash.

- Commits on Dec 14, 2025:**
 - THE screenshot of the Output (commit c3bb271)
 - a presentation built on canvas that covers the basic understanding of Fifo (commit 34f7731)
 - Remove DF assignment PPT folder from vivek(fifo) branch (commit cb7600c)
- Commits on Dec 13, 2025:**
 - the result of the simulation is provided here in the form of a screenshot (commit d534448)
- Commits on Dec 9, 2025:**
 - Added FIFO DF assignment PPT (commit eec382e)
 - included hit ratio, sum of hits and misses also ofr displaying the output as Final Results (commit d3b2be4)
 - updated the FIFO algorithm and if else results for the variables that has been assigned (commit 729450d)
 - Added FIFO cache simulation basic structure (commit 4f7f49f)

2) Repository Contribution Graph



3)Git Branch

The screenshot shows a dark-themed Git interface for managing branches. At the top right is a green "New branch" button. Below it is a navigation bar with tabs: Overview (selected), Yours, Active, Stale, and All. A search bar follows. The main area is divided into three sections:

- Default:** Shows one branch, "main", which was updated 11 hours ago. It is marked as "Default".
- Your branches:** Shows one branch, "vivek(Fifo)", updated 1 minute ago.
- Active branches:** Shows four branches:
 - "vivek(Fifo)" updated 1 minute ago, behind by 1 commit.
 - "SnehaMS(LFU)" updated 26 minutes ago, ahead by 2 commits.
 - "VismayaKoorma-S9LRU" updated 1 hour ago, ahead by 3 commits.
 - "Theertha(MRU)" updated 5 days ago, behind by 1 commit.

4)Git Merge

The screenshot shows a GitHub pull request merge history. The pull request is titled "Merge branch 'SnehaMS(LFU)'". It was merged by user "snehaMS-2003" at commit 886a5e7, 1 hour ago. The merge message is "Merge branch 'SnehaMS(LFU)'". The commit details are as follows:

File	Commit Message	Time
LFU_Module	update folder	1 hour ago
LRUWORKFLOW.pdf	Add LRUWORKFLOW.pdf	yesterday
README.md	Create README.md	2 hours ago
REFLECTION.pdf	Added REFLECTION.pdf	3 hours ago
algorithm.txt	Added algorithm.txt file	3 hours ago
dfse-assignment.pdf	Added DFSE assignment PDF	yesterday
lrureplace.py	Add LRU page replacement Python code	yesterday
output.png.png	Add output.png.png image	yesterday

5)ReadMe

Names	Roles
Sneha M S	LFU (Least Frequently Used)
Vismaya Koorma	LRU (Least Recently Used)
Theerdha Raju	Direct Mapping
Vivek	FIFO (First In First Out)
Subin Joseph	Set Associative Mapping

Link to Our GitHub Repository:

https://github.com/Vismaya-Koorma/CacheSim_Project_Team_12