

A process or situation that emulates the same concept of caching is a student preparing for and going to a class. In this scenario, the backpack is the main memory which stores all the data, including things that will be used for the task at hand and things that may not be used. It will hold things until they are needed and once they are required, will move them to the required place for easier access or use. The cache in this scenario is the pencil case. The cache will store all the things that are most likely to be needed while taking notes, as well as hold the things that were recently used. In this case, it is important to have the pencil case on the table because the things that are mostly likely to be used are easily accessible. The registers are the notebook, which store the important information and the data that operations are being performed on. And the ALU in this situation would be the brain of the student, which performs the computations and processes the data in the notebook.

In this situation, a student will first evaluate all the things they could possibly need for the class, including notebooks and a laptop and a pencil case containing everything they might need. They will then put everything that they think they need into their backpack, which they will take with them to class. In class, they will then see what items they immediately need (i.e. notebook and pencil case) and pull them out of their backpack and place it on their desk for easier access. During the lecture, the student will use the notebook to take notes and will take out a pen from the pencil case and keep the pencil case aside on the desk. While taking notes, if the student realizes that they need to highlight a certain part of their notes, they will reach for their pencil case again and pull out one highlighter. As the lecture goes on, the professor assigns an activity that requires a laptop. For this, the student has to reach for their backpack and take out their laptop from there to use it.

Using this metaphor, a cache hit would be if the student requires something and they check their pencil case and they find the thing that they are looking for in the pencil case. On the other hand, a cache hit would be if the student requires something and it is not in the pencil case and they then have to open their backpack and check in there for the thing they need.

The idea of temporal locality is that if the student needs something from their backpack such as a pencil that was not in their pencil case then they would find it in their backpack and once they are done using it, instead of putting it back into the backpack, they would put it into the pencil case since if they used it, it is likely they may need to use it again soon. The idea of spatial locality can be explained in the same scenario if a student needs a pencil, that was not in their pencil case, from their backpack. Seeing that the student needed the pencil, they will likely need an eraser too, which is also in their backpack, in case they case a mistake. So, instead of just retrieving the pencil, the student will also retrieve the eraser at the same time and will put it into their pencil case for easier access.