

# CS5248 Systems Support for Continuous Media

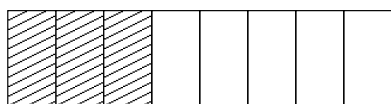
## Quiz 3

Answer the question in the space provided. Please be precise, succinct, and write eligibly. Please state your assumptions (if any) clearly.

1. Prefix segments caching, discussed in class, assumes that users access video frames in sequential order, starting from the first frame. A recent study revealed that the assumption above is not valid for lecture videos. Lecture videos attract large number of jump access – users click on the slide bar on their video player to jump to a particular moment in the video, perhaps to skip over boring parts of a lecture, or to search for materials on a hard-to-understand concept.

To cache video clips with high jump access pattern, “Interleave Segment Caching” (ISC) has been proposed. ISC divides a video clip into segments of equal length (in the order of seconds) and *disperses cached segments evenly over the whole length of the video* (See Figure 1). This way, a jump access is more likely to result in a cache hit. Furthermore, when a user jumps to an un-cached segment close to a cached segment, the cached segment can be sent as an approximation. Obviously, this scheme sacrifices cache hit ratio for sequential access, to improve cache hit ratio in jump access.

**What are the weaknesses of the proposed ISC scheme? How would you improve ISC to address these weaknesses?**



(a) Prefix Segment Caching



(b) Interleaved Segment Caching

Figure 1: Illustrations of two segment caching schemes. Shaded box represents cached segments.