# CMPEN 271

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HW #1B: Design of a Digital Answering Machine

Part 1:

We are given a sampling rate of 12KHz and a quantization of 8 bits. In order to find how much memory is required to store 20 minutes of conversation, you first convert the 20 mins into second, which would be 20 \* 60sec/min = 1200 sec. Then take the sampling rate and multiply it by the total time, 12KHz \* 1200sec = 144\*105 samples. Our quantization is 8 bits, so we multiply the samples and bits together to get the total # of bits, 144\*105samples \* 8bits/sample ≈ 1.152\*108bits. However, the last step is not necessary as 8 bits = 1 byte, so we can just cover the units to now become 144\*105bytes. This will tell us how much memory is required, which is 14MB. The correct size memory chip for this data would be 16MBs.

Part 2:

If my manager says the overall total cost for the memory chips is too high, I would first suggest reducing the conversation lengths. We could try and cut it down to storing only 10-15 mins of conversation. The second would be to reduce the quantization to 4 or even go down to 2 bits. Third suggestion would be lowering the sampling rate. Cutting any one of three parts should reduce the size of the memory needed and memory chip.