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2 Title: Assignment 1
3 Subtitle: Computer performance, reliability, and scalability calculation
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## ## 1.2

### #### a. Data Sizes

Provide estimates for the size of various data items. Please explain how you arrived at the estimates for the size of each item by citing references or providing calculations.

Data Item	Size per Item
-----:-----	-----:
128 character message.	128 Bytes
1024x768 PNG image	1 MB
1024x768 RAW image	7.5 MB
HD (1080p) HEVC Video (15 minutes)	36 MB
HD (1080p) Uncompressed Video (15 minutes)	36000 MB
4K UHD HEVC Video (15 minutes)	228 MB
4k UHD Uncompressed Video (15 minutes)	228000 MB
Human Genome (Uncompressed)	1.5 GB

1. 1 character is 8 bits ? so 128 character message is 128 bytes.
2. Pixels 1024x768 = 786432 each pixel in an img needs 3 bytes in memory.
3. depth of 10 =  $1024 * 768 * 1024 = 2.25\text{mb}$  png
4. 30 fps 8 bit depth x 15 mins =  $900\text{s} * 30 * 1290 * 1080 * 8 / 8 / 1000 / 1024 = 36\text{mb}$
5.  $1000 * 4 = 36\text{kmb}$
6. 4k x 15 mins:  $30 * 900 * 4096 * 2160 * 8 / 8 / 1000 / 1024 / 1023 = 228\text{mb}$
7. 1000x larger = 228000mb
8.  $6 * 10^9 = \text{genome} * 1 \text{ byte} / 4 = 1.5 \text{ gb}$

### #### b. Scaling

Using the estimates for data sizes in the previous part, determine how much storage space you would need for the following items.

	Size	# HD
-----:-----	-----:	-----:
Daily Twitter Tweets (Uncompressed)	64 GB	1
Daily Twitter Tweets (Snappy Compressed)	43 GB	1
Daily Instagram Photos	75 TB	23
Daily YouTube Videos	104 TB	32
Yearly Twitter Tweets (Uncompressed)	23 TB	7