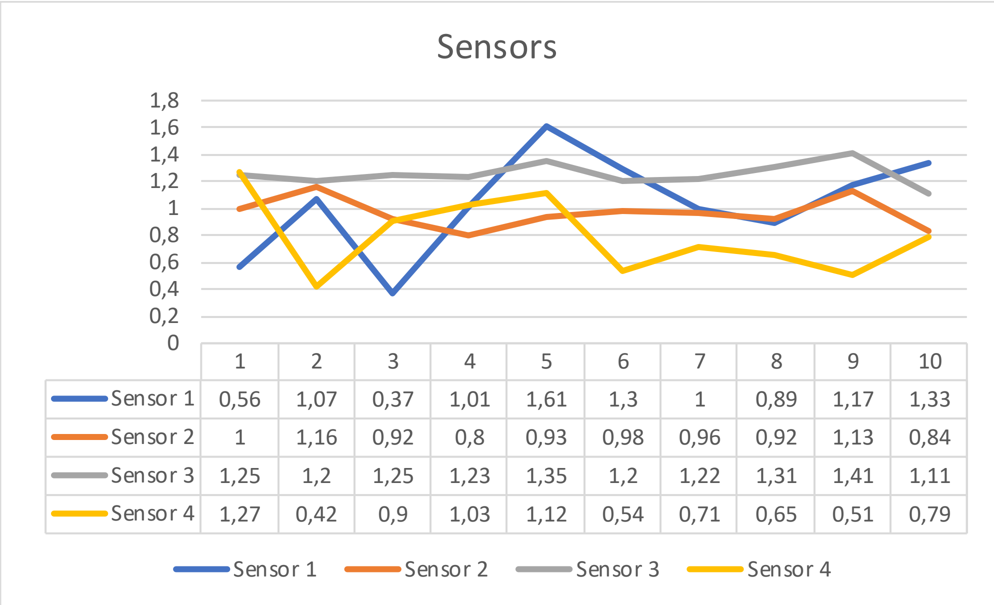
Problem 1

The first plot (leftmost) is the most linear, as the data points align closely to a straight line. This indicates a consistent, linear relationship between x and y, with minimal deviation.

Answer: The sensor represented by the first plot (leftmost) is the most linear.

Problem 2

I first plot the measurements in a graph:



	1	2	3	4	5	6	7	8	9	10
Sensor 1	0,56	1,07	0,37	1,01	1,61	1,3	1	0,89	1,17	1,33
Sensor 2	1	1,16	0,92	0,8	0,93	0,98	0,96	0,92	1,13	0,84
Sensor 3	1,25	1,2	1,25	1,23	1,35	1,2	1,22	1,31	1,41	1,11
Sensor 4	1,27	0,42	0,9	1,03	1,12	0,54	0,71	0,65	0,51	0,79

After visually inspecting the lines, it appears that sensor 2 and 3 appears to be the most stable. Since this task describes a constant speed measured, a sensor that gives a more stable output indicate that the values are closer to another and furthermore describes a better precision. Then I calculate the standard deviation and the mean value to verify the theory. I then color grade the different values according to how "close" they were to the optimal value.

	Stdav	**Mean**	Comment
Sensor 1	0,28609439	1,031	Fairly accurate and moderately precise. Close to 1 m/s but with some variation.
Sensor 2	0,316731353	0,964	Accurate but has high variability. Average close to 1 m/s, but precision could be improved.
Sensor 3	0,31519835	1,253	High precision but inaccurate. Consistently overshoots 1 m/s, indicating a bias.
Sensor 4	0,152212844	0,794	Very precise but inaccurate. Consistently undershoots 1 m/s, showing high consistency

Answer: Sensor 1 or 2 is likely the best choice if one needs a balance of accuracy and precision. If consistency is prioritized and can correct for inaccuracy, Sensor 3 or Sensor 4 could be suitable, depending on whether an over- or underestimation is more acceptable.

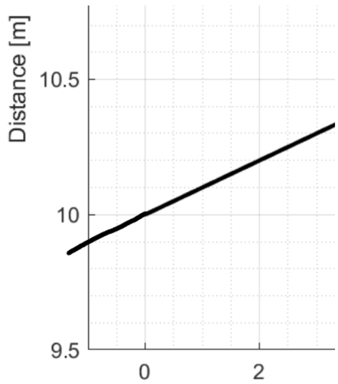
Problem 3

This is a quite straightforward problem as it can be solved with the linear equation formula:

$$y = kx + m, \qquad k = \frac{\Delta y}{\Delta x}$$

$$k = \frac{11 - 10}{10 - 0} <=> 1.1$$

Looking at the graph, the line should intersect the y-axis at y=9.9:



This gives us the result $y = 1.1x + 9.9$, where $x = Volt[V]$ and $y = Distance[m]$. Insertion of 7V in the formula:

$$y = 1.1 * 7 + 9.9 = 17.6$$

Answer: 17.6 meters.