In today's class, I finally understood what Six Sigma basically means and how we measure variation in a process. Six Sigma is all about reducing errors by reducing variation as much as possible. The idea is that in any process, the output will naturally vary—sometimes it will be slower, sometimes faster—and this spread of values is measured using **sigma**, which is basically the standard deviation. The smaller the deviation, the more consistent the process. In a perfect Six Sigma process, the variation is so small that the probability of error becomes extremely low. We even measure how far the process average can move before causing defects, and that tolerance is often explained as "sigma divided by six." The higher the sigma level, the more capable the process is of meeting the requirement without slipping.

We also talked about **kurtosis**, which is a measure of how "peaked" or "flat" our data distribution is. When kurtosis is high, most of our times are tightly clustered around the average, which is good for consistency. Low kurtosis means the distribution is flatter, showing more extreme values—this means the process has higher chances of producing outliers like very late deliveries. Understanding kurtosis helped me see that variation is not just about the width of the curve (standard deviation) but also how the data bunches together.

To apply all this, we took our tea-delivery example and calculated everything. Out of 50 tea orders, 28 were late, which already shows a lot of variation because the cafeteria promises tea within 5 minutes. My mean delivery time came out to around **5.68 minutes**, which is already above the requirement, and the **standard deviation was 1.79**, which shows that times are spread out. Some orders took only 3–4 minutes, but others hit 9 minutes. With this level of variation, our sigma value was around **1.3**, which is extremely low. For a Six Sigma process, we expect almost no defects. Here we were getting late orders very frequently. The DPU and DPMO also confirmed how poor the capability was.

We then broke down the entire tea-making workflow step by step:
s1: order tea
s2: make receipt
s3: pay
s4: stand at service counter
s5: get up
s6: add tea + whitener + sugar
s7: warm water
s8: mix everything
s9: provide teaspoon
s10: take receipt and hand over tea

Looking at the times, some of these steps took longer than they should. For example, warming water could delay the whole process if the heater isn't ready. Adding ingredients takes longer when material is missing. Even small actions like not finding a teaspoon quickly can stretch the delivery beyond 5 minutes. These variations add up until we get inconsistent service.

To properly understand why the process was failing, we used the **fishbone (Ishikawa) diagram**, which I personally found very helpful because it visually separates causes into categories. I filled in all the categories based on this tea process. Under **Measurements**, issues like money or receipts not being recorded properly can slow down the early steps. Under **People**, the staff's coordination, speed, and clarity of roles directly affect how fast each step moves. In **Materials**, missing cups, spoons, tea, whitener, sugar, or even poor-quality ingredients all create delays. In the **Environment** category, the physical layout and space restrictions at the counter make movement slower. Under **Machines**, a water heater not functioning efficiently becomes a major bottleneck. For **Processes**, the exact sequence (order → receipt → pay → serve) must be followed properly or else time is wasted in redoing or rearranging tasks. Finally, the **Problems** category covers general issues like resource unavailability or mistakes while mixing or serving tea.

When I connected all these factors, the overall picture made sense: the tea process is not failing because of one "big" issue; it's failing because **many small variations add up**. Each step adds a few extra seconds or minutes, and that cumulative variation is exactly what Six Sigma tries to minimize. By narrowing down the causes through the fishbone structure and understanding the distribution (mean, SD, sigma, and kurtosis), I could clearly see how important it is to control every small part of a process. This exercise helped me understand Six Sigma much more practically.

So we're discussing six sigma
Measure the time
Konse points se measurement karni hai

Youtube video: https://www.youtube.com/watch?v=8_IfxPI5ObM
Alumninium coil jab woh jaa raha hai machine se uthane
Utha kar it put on sheets
Then it does uncoiling
Then it flattens the metal

1. Utha kar jaana
2. Ley kar jaana
3. Then the red machine takes it osmeonewhere else and uncoils it
4. Then it flattens it
5. Shaping using laser
6. Press it
7. Then dye it