Learning Analytics Tools
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Lecture 4.4
Charts-II

Last class, we talked about bar chart and pie chart.

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Charts

Types
- Bar chart
- Stacked bar chart
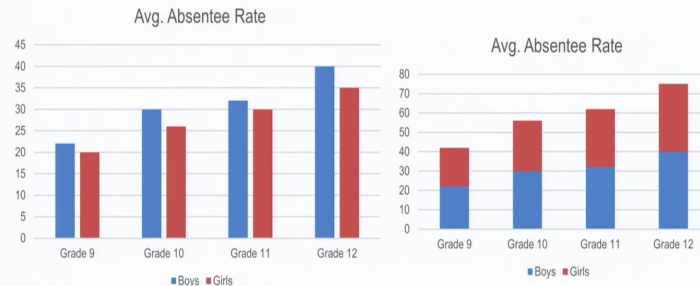- Pie chart
- Histogram
- Box plot
- Scatter plot
- Line charts

We will talk about the stacked bar chart and histogram in this video.

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The stack bar chart is a variation of the standard bar chart we saw in our last video that we can use a bar chart for comparing the individual data. In the last class, we saw a similar chart where we were comparing the attendance of grade 9 to 12 boys and girls. Their absentee rate for boys is more compare to girls and also we saw that in grade 9 it is less compared to grade 12. The same chart can be represented as the stacked bar chart that is both vales will be stacked. The only drawback here is it is not clearly showing how much difference is between boys and girls

For example, here you can see that there is a difference of boys absentee rate is on average high on all the grades compare to girls but in this chart, it is not clear but this is also another way of representing bar charts called stack bar charts.
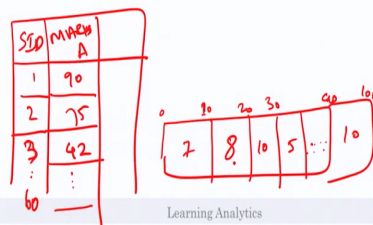
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So, there is a variation of the stacked bar chart that is what we saw in the last slide. This is the stack bar chart. The variation is converting into 100 percentage. So, here the value will be represented further percentage instead of the absolute value say 22 per cent of boys absentees average rate for grade 9. Here that will be represented as a percentage compared to the total value. So, we know that that is a stack bar chart adjusted for the percentage. So, this is a simple stacked bar chart.

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Let us move on to the other type of chart called a histogram. In the histogram, we want to show the distribution of numerical values. The input values split into several bins and plotted. What we mean by the distribution of numerical values is, for example, you have a class of 60 students. Student ID from 1 2 to 60 students and you have their marks, marks in subject A.

Say 90, 75, 42 something like that. So, you have these marks of a class of 60 students in a subject A you want to represent and this in a bar chart. What happens in the bar chart is it can represent only the average value or all the student's marks can be shown in the bar chart but it will be too clumsy because there are 60 students. Instead, you can show the distribution of marks using the histogram.

What we have to do. We have to split this course into several bins for example consider the total mark is 100. If the exam is for 100 marks you can make several bins of say I want to know how many students got 0 to 10 marks. How many students got 10 to 20. How many students got so something like that. So, you will have a 90 to 100 bin as well.

So, basically what you have to do you is to calculate how many students got a mark from 0 to 10 students. So, some numbers like that, so it will show you how marks are distributed in your class.

Students perform so much in a class on a subject A. So, the marks of 60 students in course A can be shown as a histogram. So, let us see these bins this is the histogram. Here, let me delete this bin value so if you look at this then there are like three students who got marks from 28 to 38. So, the no students got below 28 and there are no students above 98 so there are only two students who got above 88 and the 5 students who got 38 to 48.

So, you can see the major difference is the at most 30 students of your class is from 50 to 70. So, these kinds of distribution will tell you that how students perform in your class is distributed across the score. So, the histogram can be used to identify the distribution of marks in the class or comparing the situation among two courses so something like that. So, you can make a histogram by simple using excel or Google sheets or you can use some scripts to create histograms.
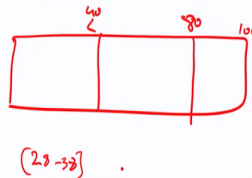
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So, we saw histogram now list down the common mistakes people do in using histograms. Please pause this video to state the common mistakes after listing it down resume the video to continue.

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So in the last slide, we saw seven bins why there are seven bins did you ask why there are seven bins and why the marks are distributed across 28 to 38 and 88 to 98 why cannot we have 5 bins why we cannot have only three-bin say less than 40 to 88 to 100.

Why we had seven bins? So, if we have several bin sizes say instead of 7 if we want to use 10 bins or instead of 10 if I want to use 5 or 3 bins the conclusion might differ. Suppose you might say that lot of students score less than 40 or a lot of students were in the range of 50 to 70. Now, I might move to less than 60 and more than 70 to 80 something like that.

So, conclusion inference might vary based on the bin size also. So, you have to careful in using these bin sizes and why you pick this kind of bins should be supported and argued correctly. And, the histogram can compare two groups for example marks in a math and science.

And their important point is all the bin size should be equal. You should not have a bin for example I was telling that you cannot have one bin of less than 40 marks, other from 40 to 80 ,and the last one from 80 to hundred. The bin size is not equal you know. So this is not correct so make sure your all the bins should be equal also.

When you compare marks A to marks B make sure that the bin size is the same. Also, why we are picking several bin sizes. Try several bins and compute the histogram and see which ones make sense. And you should have a stronger argument why you pick that bin number equal to 7 or 8. In excel you can change the bin size or number of bins to be used in the histogram easily. I pick the bin size of 28 to 38 instead you can say no I want a bin from 20 to 30, 30 to 40 that is all possible. So, make sure you have bin size and number of bins selected properly when using the histogram.

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Summary

- Stacked Bar Charts
- Histogram

So, in this video, we saw stacked bar chart and histogram and we will see some more chart now next video. Thank you.