

# The Art of Data Presentation

10-1

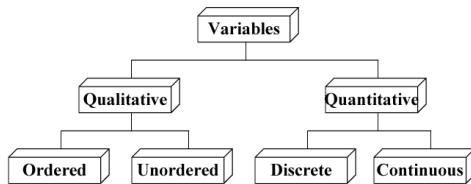


## Overview

- Types of Variables
- Guidelines for Preparing Good Charts
- Common Mistakes in Preparing Charts
- Pictorial Games
- Special Charts for Computer Performance
  - Gantt Charts
  - Kiviat Graphs

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## Types of Variables

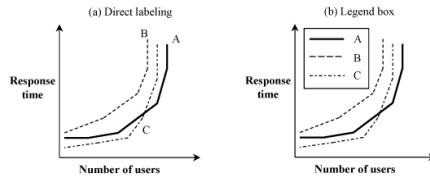


- Type of computer: Super computer, minicomputer, microcomputer
- Type of Workload: Scientific, engineering, educational
- Number of processors
- Response time of system

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## Guidelines for Preparing Good Charts

- Require minimum effort from the reader
- Direct labeling vs. legend box

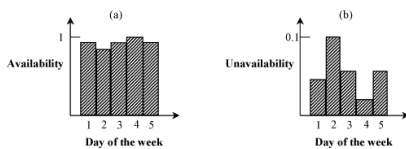


- Maximize Information: Words in place of symbols
- Clearly label the axes

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## Guidelines (cont)

- Minimize Ink: No grid lines, more details

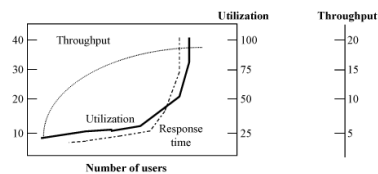


- Use Commonly accepted practices: origin at (0,0)  
Independent variable (cause) along x axis, linear scales, increasing scales, equal divisions
- Avoid ambiguity: Show coordinate axes, scale divisions, origin. Identify individual curves and bars.
- See checklist in Box 10.1

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## Common Mistakes in Preparing Charts

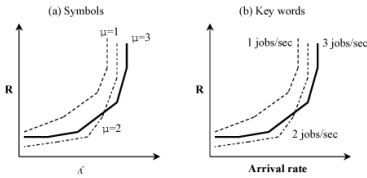
- Presenting too many alternatives on a single chart  
Max 5 to 7 messages => Max 6 curves in a line charts, no more than 10 bars in a bar chart, max 8 components in a pie chart
- Presenting many y variables on a single chart



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## Common Mistakes in Charts (Cont)

- Using symbols in place of text

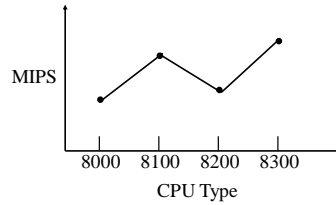


- Placing extraneous information on the chart: grid lines, granularity of the grid lines
- Selecting scale ranges improperly: automatic selection by programs may not be appropriate

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## Common Mistakes in Charts (Cont)

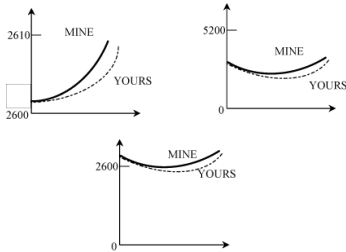
- Using a line chart in place of column chart: line => Continuity



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## Pictorial Games

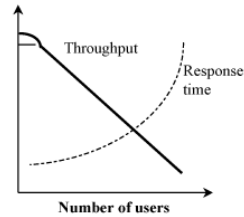
- Using non-zero origins to emphasize the difference  
Three quarter high-rule => height/width > 3/4



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## Pictorial Games (Cont)

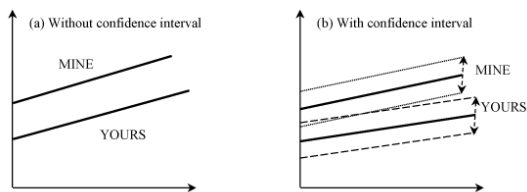
- Using double-whammy graph for dramatization  
Using related metrics



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## Pictorial Games (Cont)

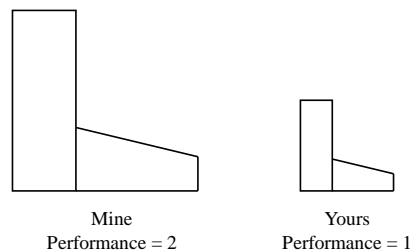
- Plotting random quantities without showing confidence intervals



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## Pictorial Games (Cont)

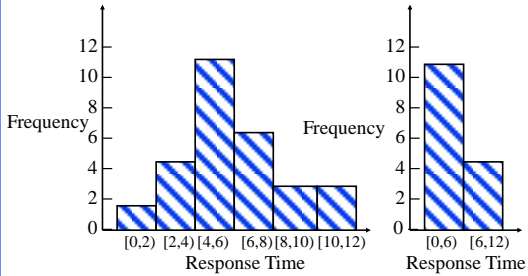
- Pictograms scaled by height



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## Pictorial Games (Cont)

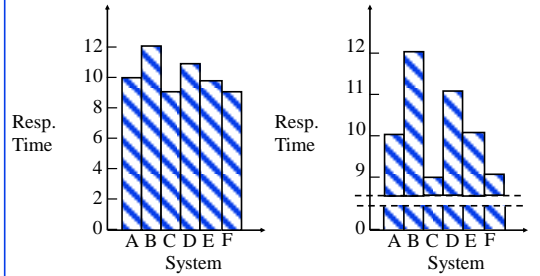
- Using inappropriate cell size in histograms



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## Pictorial Games (Cont)

- Using broken scales in column charts



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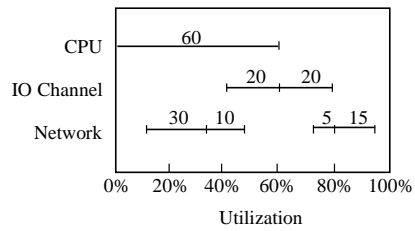
## Special Charts for Computer Performance

- Gantt charts
- Kiviatt Graphs
- Schumacher's charts

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## Gantt Charts

- Shows relative duration of a number of conditions



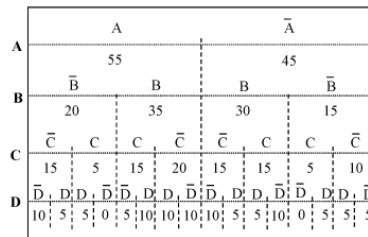
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## Example: Data for Gantt Chart

A	B	C	D	Time Used
0	0	0	0	5%
0	0	0	1	5%
0	0	1	0	0%
0	0	1	1	5%
0	1	0	0	10%
0	1	0	1	5%
0	1	1	0	10%
0	1	1	1	5%
1	0	0	0	10%
1	0	0	1	5%
1	0	1	0	0%
1	0	1	1	5%
1	1	0	0	10%
1	1	0	1	10%
1	1	1	0	5%
1	1	1	1	10%
Total				100%

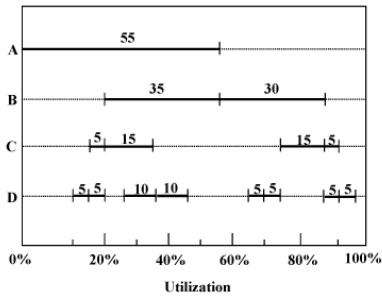
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## Draft of the Gantt Chart



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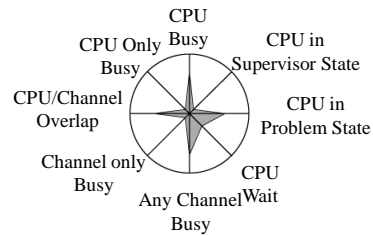
## Final Gantt Chart



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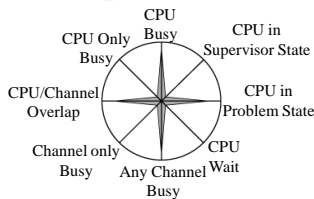
## Kiviati Graphs

- Radial chart with even number of metrics
- HB and LB metrics alternate
- Ideal shape: star



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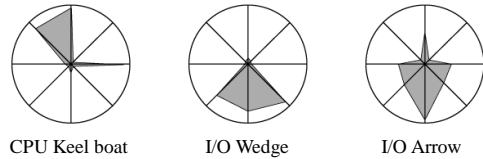
## Kiviati Graph for a Balanced System



- **Problem:** Inter-related metrics
  - CPU busy = problem state + Supervisor state
  - CPU wait = 100 - CPU busy
  - Channel only - any channel - CPU/channel overlap
  - CPU only = CPU busy - CPU/channel overlap

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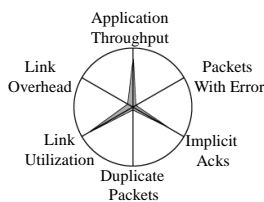
## Shapes of Kiviati Graphs



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## Kiviati Graphs For Other Systems

- Networks:



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## Summary

1. Qualitative/quantitative, ordered/unordered, discrete/continuous variables
2. Good charts should require minimum effort from the reader and provide maximum information with minimum ink
3. Use no more than 5-6 curves, select ranges properly, Three-quarter high rule
4. Gantt Charts show utilizations of various components
5. Kiviati Graphs show HB and LB metrics alternatively on a circular graph
6. Workload, metrics, configuration, and details can always be challenged. Should be carefully selected.

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