Statistical Study – Exercise

Cont'd

- Describe how you would apply the five basic steps in a statistical study to estimate the average time that local CityU students use to travel from home to campus.
  - Step 1: Goal of the study: to estimate the average time that local CityU students use to travel from home to campus; Target population: all local CityU students
  - Step 2: To select a sample from local CityU students
  - Step 3: Collect the time in minutes that the student at the sample traveled from home to campus. Calculate the sample means of travelling time for the students
  - Step 4: Use statistical techniques to infer the likely results for the entire population of local CityU students
  - Step 5: Based on the likely population results, draw conclusions about the average time that local CityU students use to travel from home to campus

Types of Variables – Exercise

Cont'd

Age	Gender	Major	Credits	District	GPA
18	Male	Management Sciences	16	Hong Kong Island	3.6
21	Male	Accountancy	18	New Territories	3.1
20	Female	Marketing Information Mgt	16	Kowloon	2.8

- **Numerical**
  - Age
  - Credits
  - GPA

- **Categorical**
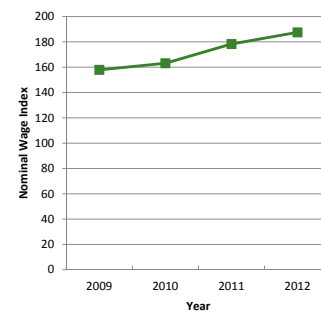 - Gender
  - Major
  - District

Faulty Graphs:
Chart Junk

Bad Presentation

Nominal Wage Index in Hong Kong
(Sept 1992=100)

2009: 157.9
2010: 163.1
2011: 178.3
2012: 187.5
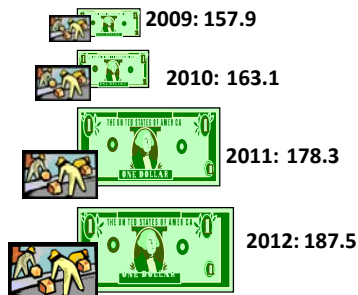
Good Presentation
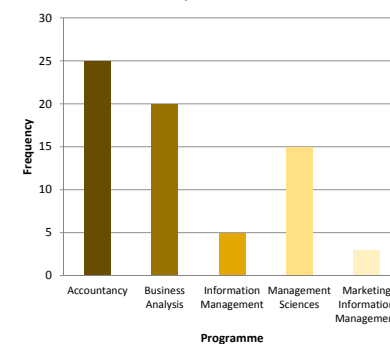
Nominal Wage Index in Hong Kong
(Sept 1992=100)

Faulty Graphs:
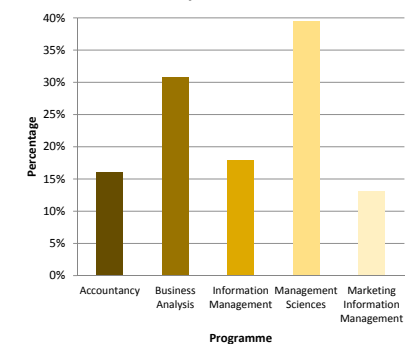# No Relative Basis

Cont'd

Bad Presentation

A's Obtained by Students in MS2200

Good Presentation
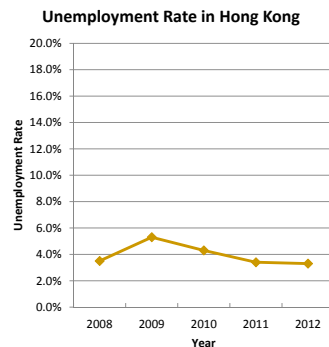
A's Obtained by Students in MS2200
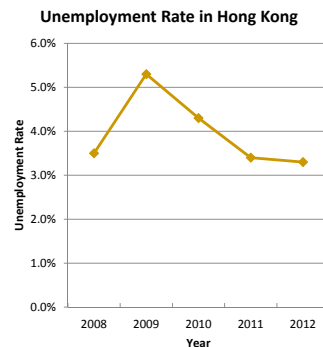
Faulty Graphs:
Compressing the Vertical Axis
Cont'd

🚫 **Bad Presentation**   ✔ **Good Presentation**

Unemployment Rate in Hong Kong (Bad)

Unemployment Rate in Hong Kong (Good)

Faulty Graphs:
No Zero Point on the Vertical Axis
Cont'd

🚫 **Bad Presentation**   ✔ **Good Presentation**

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Use and Misuse of Statistics

HP to Lay Off 9,000 in Enterprise Services Revamp

In the case of the HP layoff, there were actually 324,600 staff members employed by HP at the time. Therefore, the percentage change in total employees as a result of the layoff was just:

$$\frac{9,000}{324,600} \times 100\% \approx 2.77\%$$

which suddenly diminishes the severity of the issue

the business is critical to HP's success, but it isn't doing terribly well.

The enterprise operation is part of HP's plan to diversify beyond hardware and become more competitive with rival IBM (IBM). HP bought information-technology consulting firm EDS in May 2008 for $13.1 billion. In March 2009, HP said it would eliminate 24,600 jobs during the integration of EDS -- but it's not entirely clear whether the new layoffs are a subset of those or in addition to them.

Use and Misuse of Statistics:
Faulty Percentages
Cont'd

Election Committee for Chief Executive Election

However, some people might not think that it was enough. They did not consider the "percentage change". Instead, they just looked at the percentage of members with respect to the total number of Hong Kong citizens. The "percentage" is then:

$$\frac{1,200}{7,000,000} \times 100\% \approx 0.017\%$$

Although both sets of percentages are true, they have different connotations and suggested implications. We should see how the selection of which percentage to use actually depends on the message someone wants to convey.

50%

Quartiles – Exercise

Data in ordered array:

3   6   7   7   9   12

Position of $Q_1 = \frac{(6+1)}{4} = 1.75^{th} = 2^{nd}$ (round off)

$Q_1 = 6$

Position of $Q_3 = \frac{3(6+1)}{4} = 5.25^{th} = 5^{th}$ (round off)

$Q_3 = 9$