Forecasting

Statistics + Suggested Solution
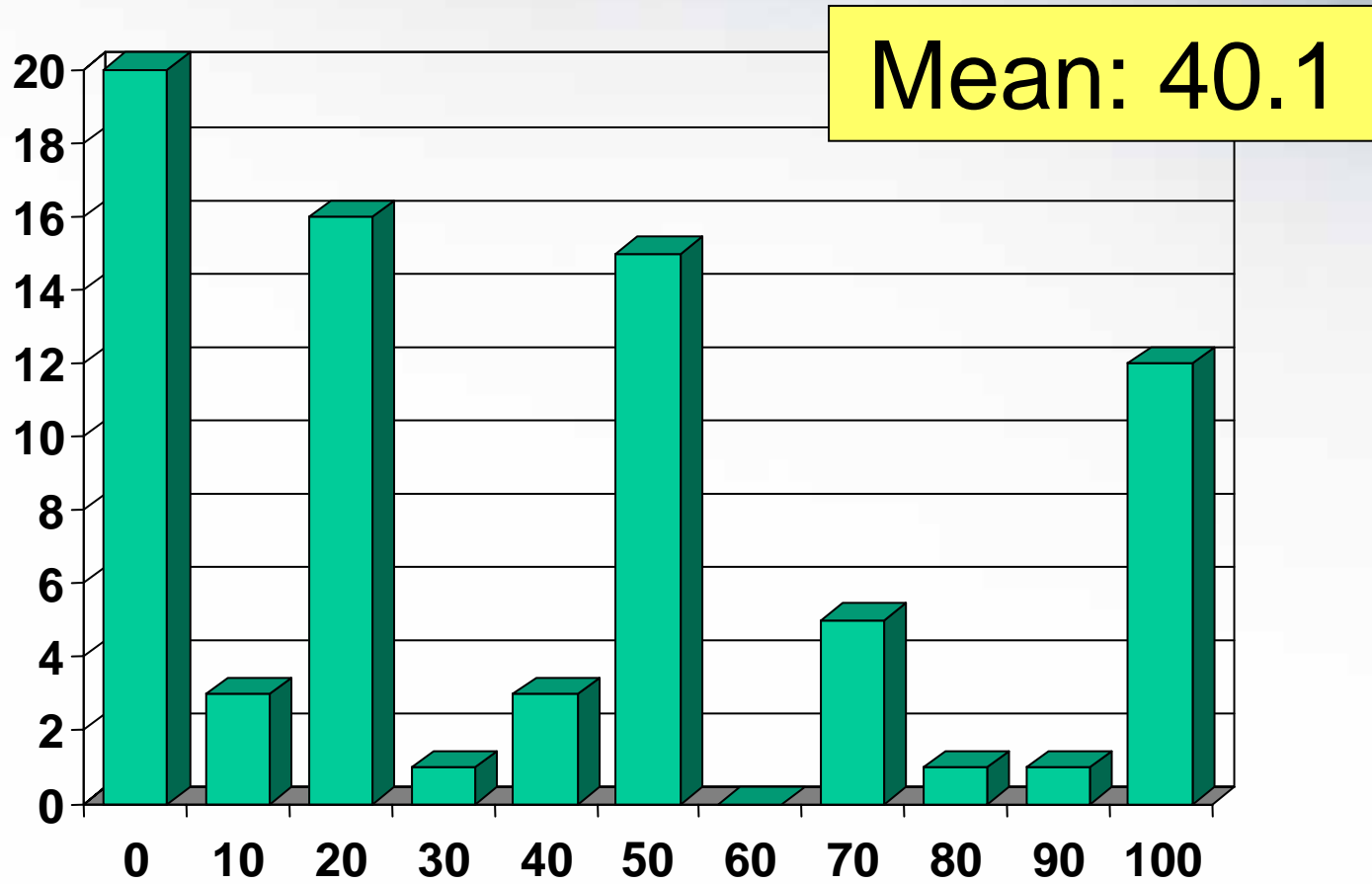
Problem Description

- HKOI Online Judge Problem 2046
- Calculate MAD of a certain forecasting technique

Statistics

Mean: 40.1

Solution

1. Make forecast
2. Calculate MAD

Making Forecast

- Sum up previous K days' sales, then divided by K
  - $F_n = (a_{n-1}+a_{n-2}+\ldots+a_{n-k+1})/K$
- Slow when N is large and K≈N/2
- Better algorithm:
  - Avoid summing up all K values every run

Making Forecast (2)

$$K \times F_n = a_{n-1} + a_{n-2} + \ldots + a_{n-k+1}$$

$$-\,) \quad K \times F_{n-1} = \qquad a_{n-2} + \ldots + a_{n-k+1} + a_{n-k}$$

$$K\,(F_n - F_{n-1}) = a_{n-1} \qquad\qquad\qquad\qquad -\ a_{n-k}$$

$$\rightarrow F_n = (K \times F_{n-1} + a_{n-1} - a_{n-k})\,/\,K$$

Common Mistakes

- Overflow
  - 16-Integer signed range: [-32768,32767]
- Finding 2-day moving average instead of K-day