IS2111

Computer Networks

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Who am I?

- Senior lecturer - University of Colombo School of Computing.
- Education
  - B.Sc. (Comp. Sci.) - University of Colombo -1997.
  - M.Sc. - University of British Columbia, Canada - 2000.
  - Ph.D. - University of British Columbia, Canada - 2005.
- Marie-Curie Fellow at SICS Swedish ICT, Stockholm, Sweden (2013 - 2014).
- Teaching
  - Operating Systems.
  - Computer Networks.
  - Theoretical Computing.
  - Cryptographic Systems

Learning Outcomes

- Explain the principles underlying the layered systems architectures and their application to computers networks.
- Describe the functionality and the role of different hardware and software components used in networks.
- Apply the core concepts underlying IP networks to solve simple network design problems, including IP subnetting.

Course Contents

ACM IS 2010 Networking subtopics of IS 2010.4 IT Infrastructure

- Types of networks
- Core network components
- TCP/IP model
- Physical layer: wired and wireless connectivity
- Data link layer: Ethernet
- Network layer: IP, IP addressing and routing
- Transport layer: TCP
- Application layer: core Internet application protocols
- Network security and security devices
- The Internet as a key networking platform
- Network device configuration

Reading

- **Computer Networks** by Andrew S. Tanenbaum

Evaluation

- Continuous Assessment: 40%
  - One assignment per week
- Final Paper: 60%

Past Papers

- IS2111
- IS2011
- ICT1010

Data Communication

Some concepts

- Symbols
- Protocol
- Encoding
- Baud rate
- Bit rate

Semaphore Telegraph

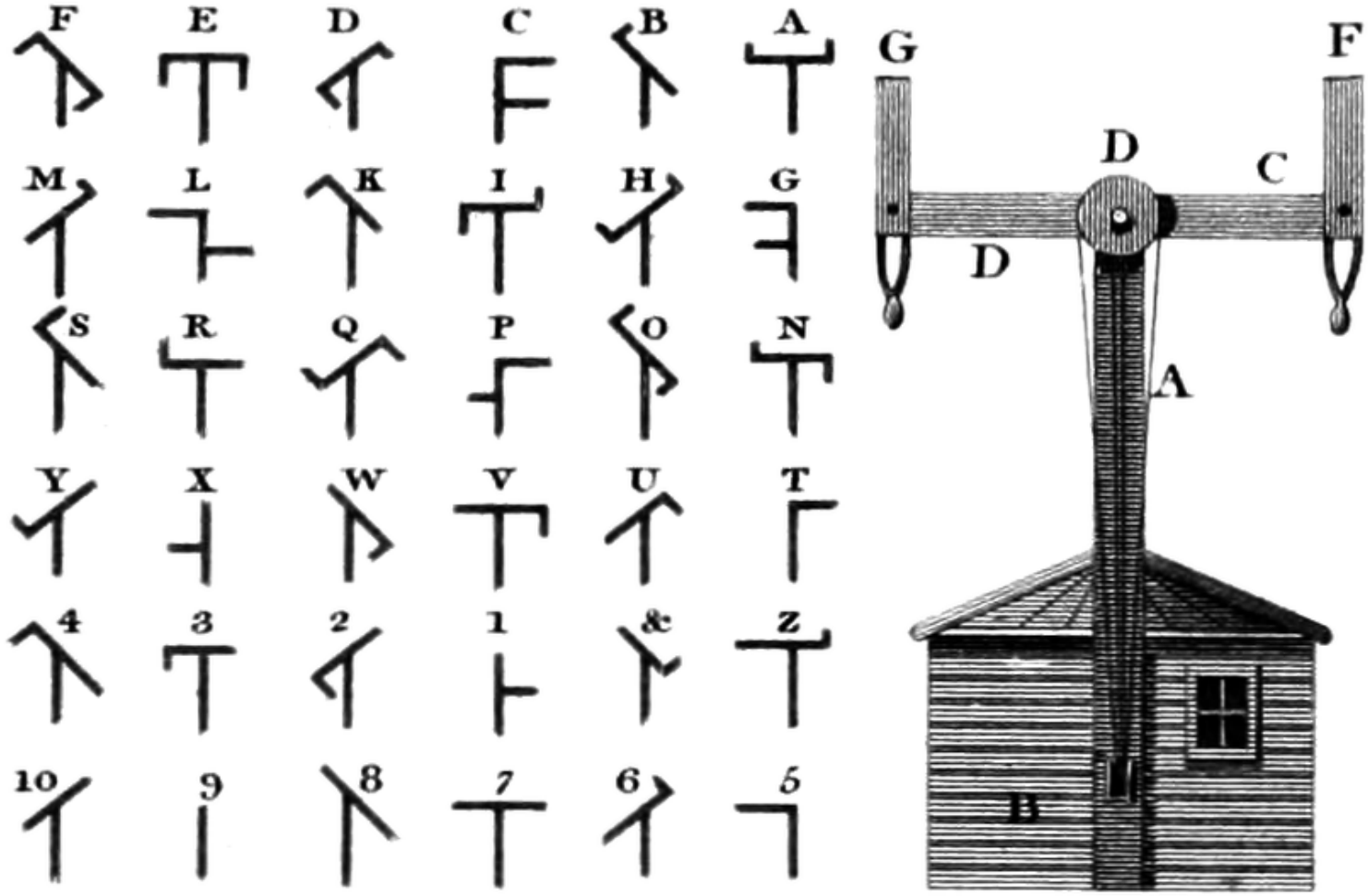


image credit: Wikipedia

Light Signals

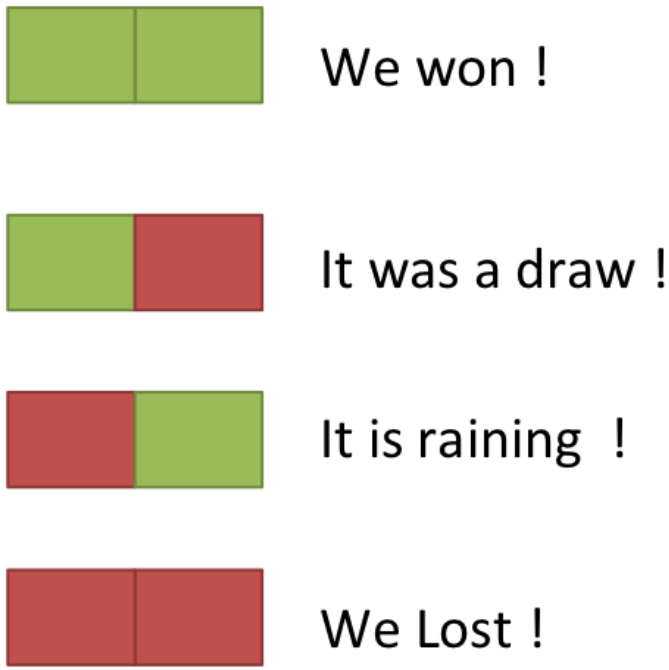
image credit: Wikipedia

Light Signals - Two Symbols and Two Messages

We won !

We Lost !

Interpret Two Signals at a Time

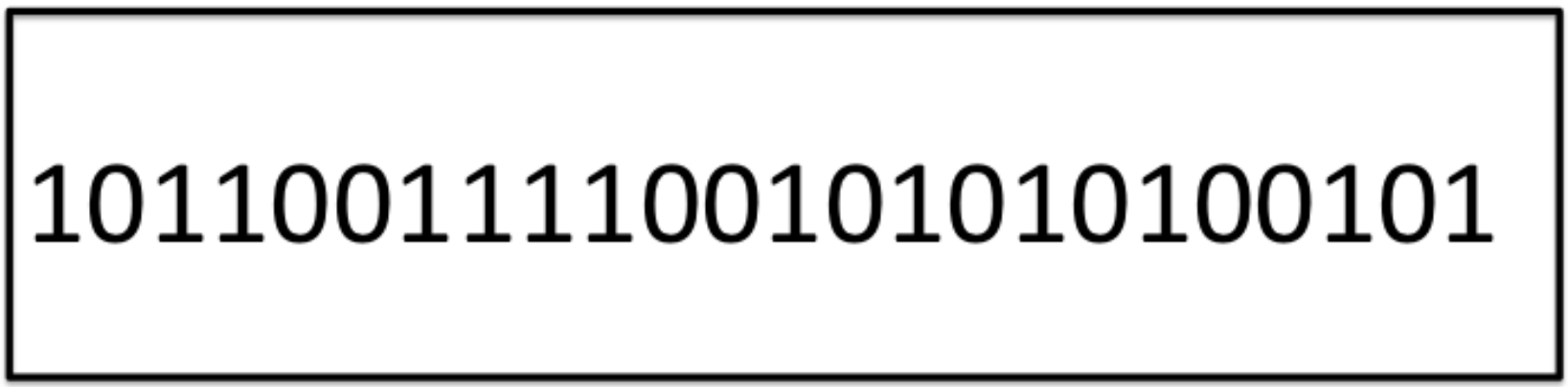


- How long should we flash the light for one symbol?

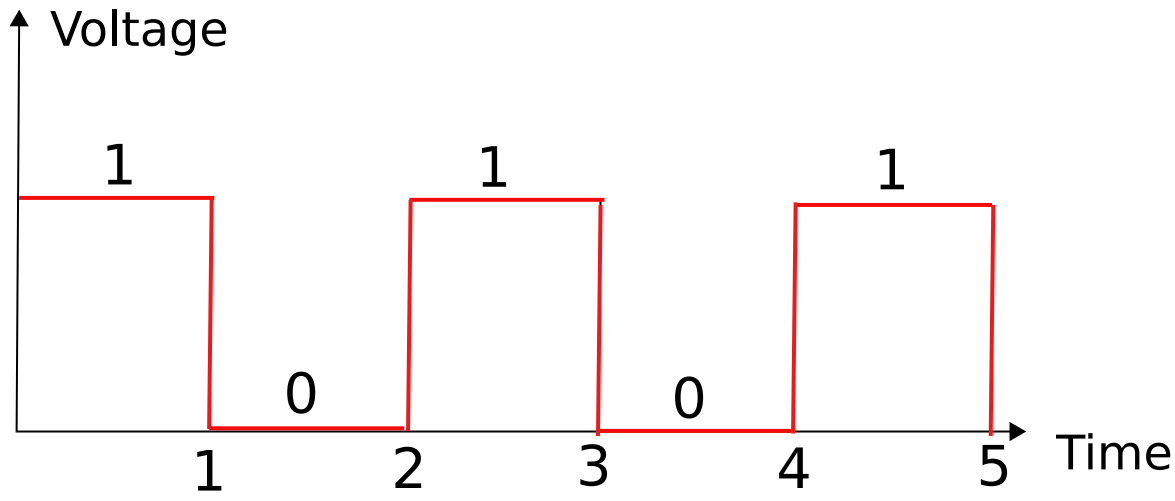
String of Bits

10110011110010101010100101

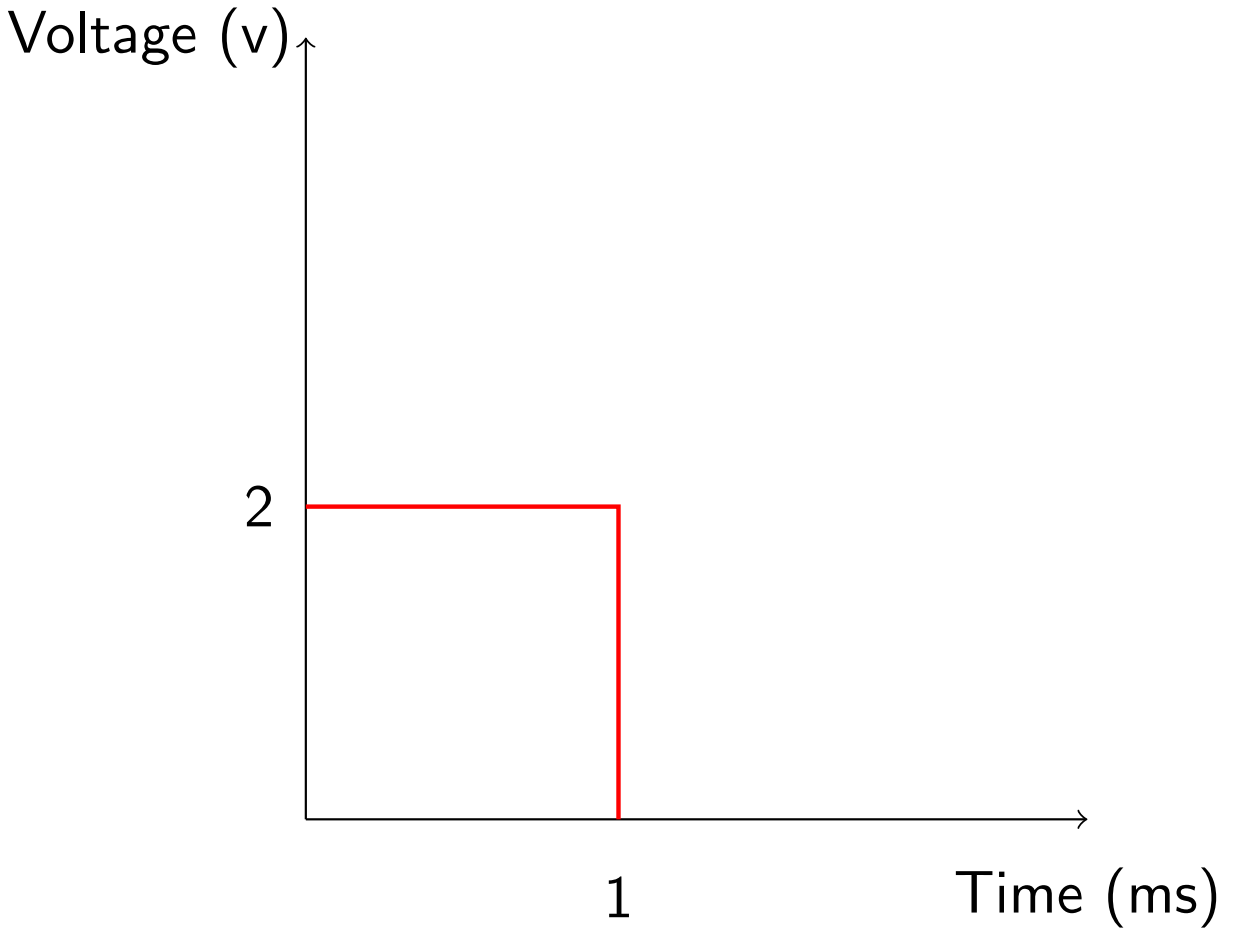
A Frame



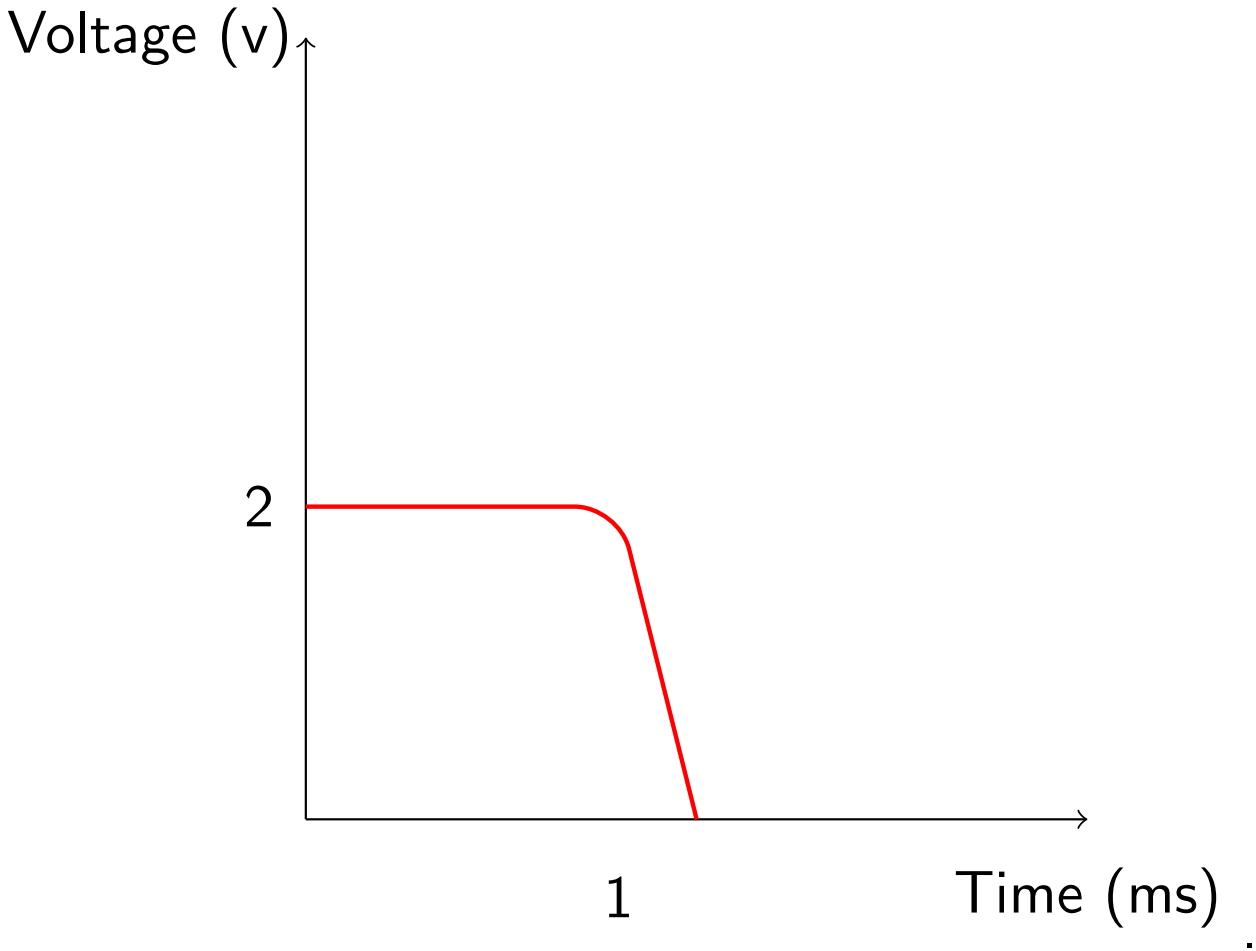
A digital signal with two levels



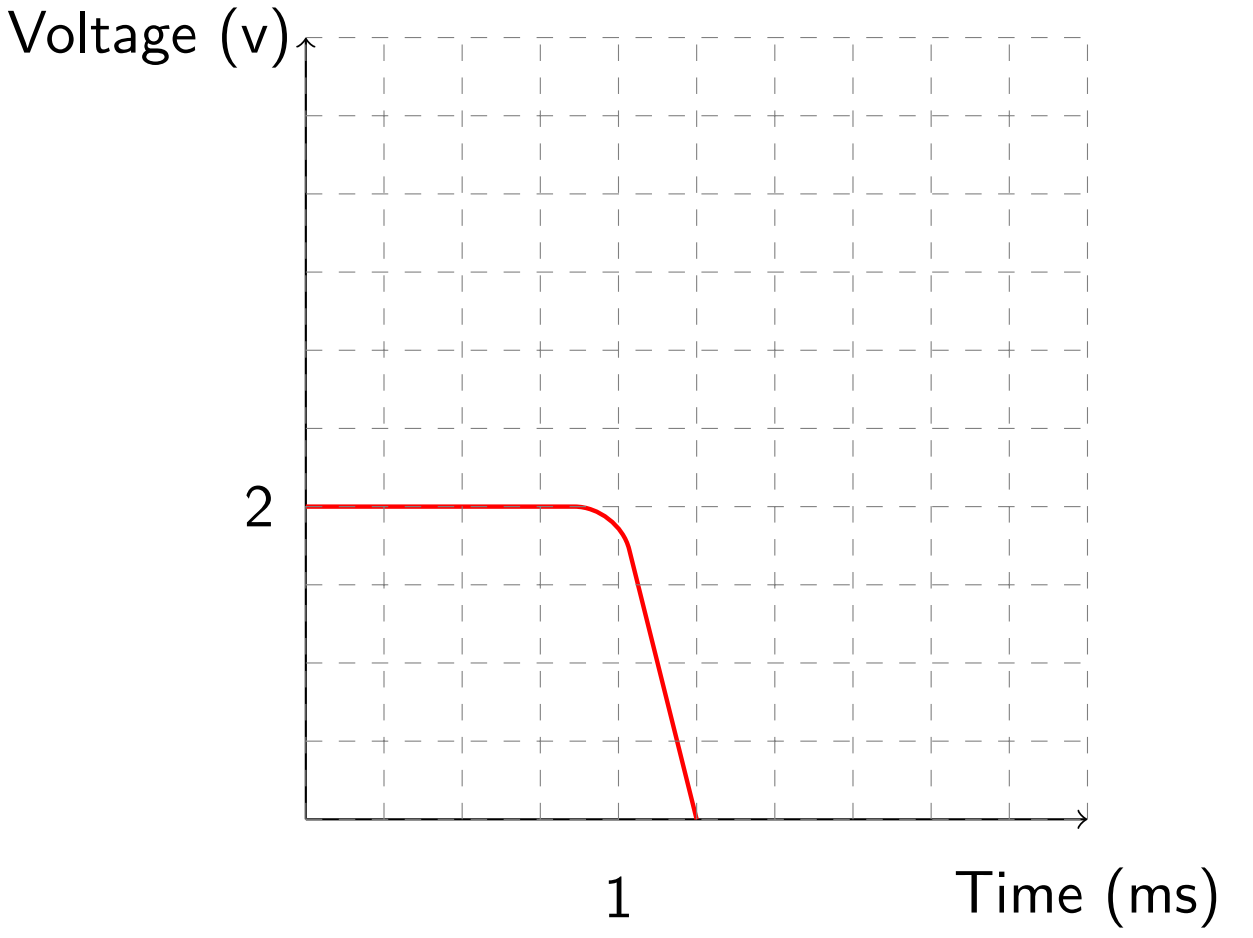
What is wrong ?



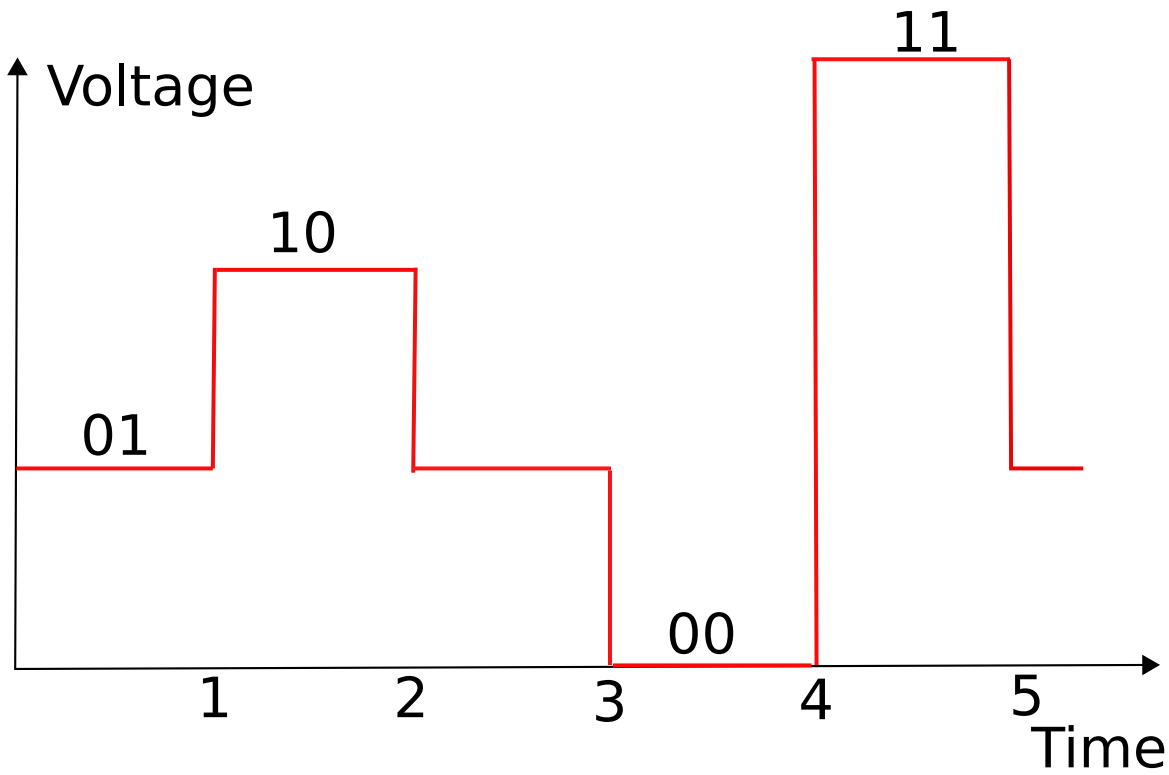
Slew Rate



Slew Rate



A signal with four levels



Bits and Bauds

- Baud rate = ??? per second
- Bitrate = ??? per second