

Sistem Komputer

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Hardware & Software

- **Hardware**

Perangkat/komponen-komponen fisik yang saling bekerja sama dalam membentuk komputer.

- **Software**

Perangkat lunak/program yang berjalan pada suatu komputer.

Hardware:

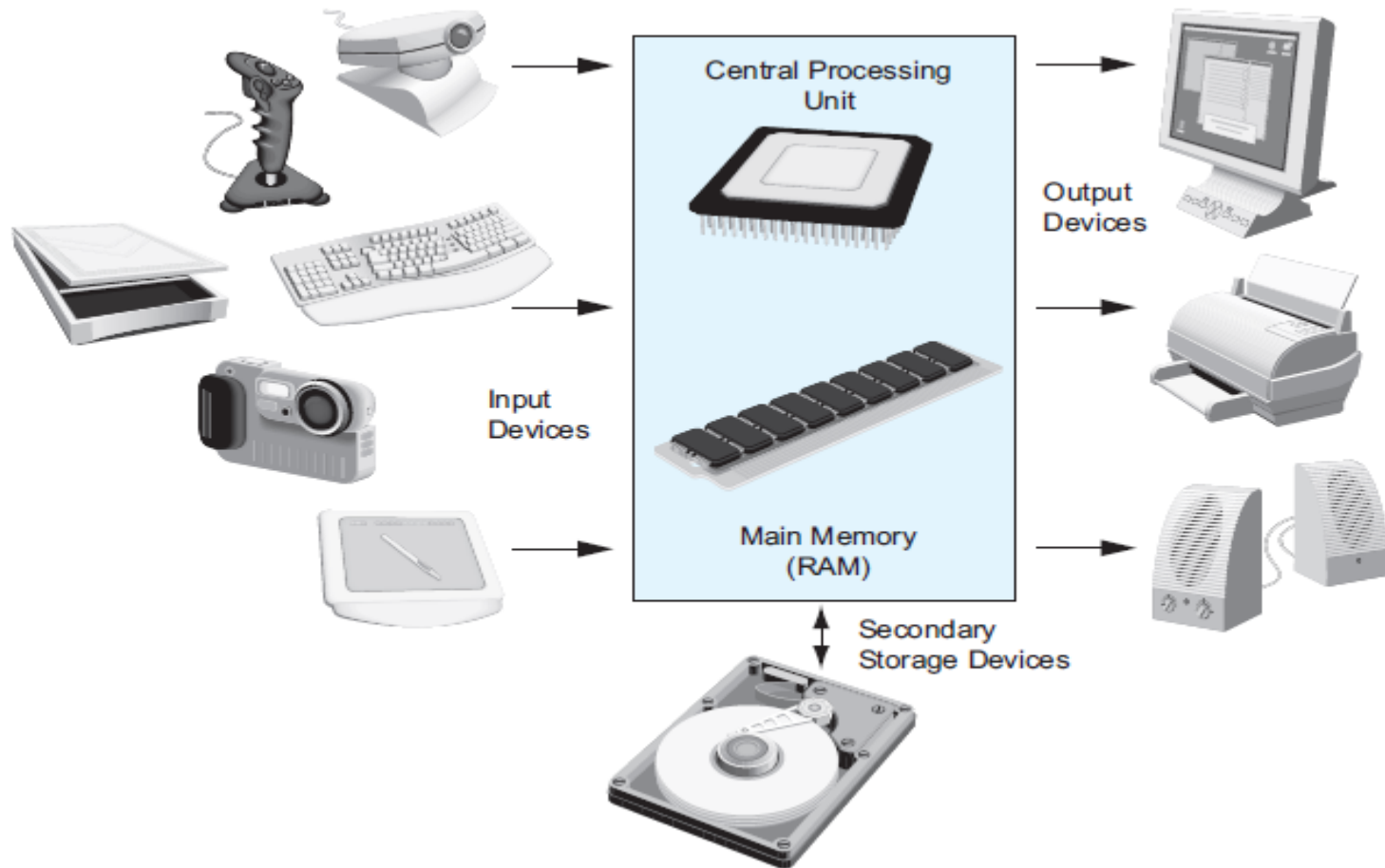
- Consist of all the machinery and equipment in a computer system
- The hardware include among other devices, the keyboard, the screen, the printer and the box (**the computer or processing devices itself**)
- Hardware is useless without software

[Williams & Sawyer, 2010]

Komponen Utama Sistem Komputer

- Central processing unit (CPU)
- Main memory
- Perangkat Penyimpanan Sekunder/Secondary Storage
- Perangkat Input
- Perangkat Output

Computer System



CPU

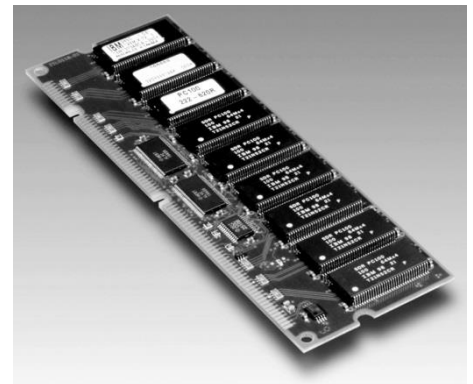
- Perangkat pemroses yang terdiri dari komponen
 - Control Unit
 - ALU
 - Registers
 - Buses

CPU

- **Control Unit** mengontrol operasi dari CPU
- **Register** merupakan penyimpanan internal pada CPU
- **ALU** menjalankan fungsi pemrosesan data
- **Buses** digunakan sebagai jalur komunikasi antara ALU, Registers, and Control Unit

Main Memory

- Memory utama sebagai area kerja dari pemrosesan komputer.
- Dikenal dengan Random-Access Memory(RAM)
- Bersifat *Temporary*



Penyimpanan Sekunder

- Penyimpanan permanen.
- Umumnya Program-program disimpan dalam memory sekunder dan dipindah ke memory utama ketika dijalankan.
- Contoh hardisk, flasdisk



Perangkat I/O

- **Perangkat Input**

Komponen yang menerima data untuk kemudian diproses oleh computer.

- **Perangkat Output**

Komponen yang mengubah informasi yang telah diproses oleh komputer menjadi bentuk yang bisa dimengerti manusia.

Software:

- Consist of all the electronic instructions that tell the computer how to perform a task

[Williams & Sawyer, 2010]

Kategori Software

- **Software Sistem**

Merupakan program yang mengendalikan dan mengatur operasi dasar komputer.

- **Software Aplikasi**

Merupakan program yang membantu keperluan tugas sehari-hari. Misl: software office, software toko, software operasional perbankan, pengolahan gambar, pengolahan video.

Software Sistem

- **Sistem Operasi**
 - Mengendalikan operasi internal perangkat komputer
 - Mengatur seluruh perangkat yang terhubung pada komputer,
 - Mengatur penyimpanan/pengambilan kembali data pada perangkat penyimpanan
 - Membuat program-program lainnya untuk bisa berjalan pada komputer tersebut.
- **Utility Programs**

Program yang menjalankan tugas-tugas khusus seperti pengamanan data (scan virus, kompresi data, backup data)
- **Software Development Tools**

Merupakan Program yang digunakan programmer untuk membuat software, memodifikasi, dan melakukan test. (Assemblers, compilers, and interpreters)

Operasi Dasar Komputer

Input Operation

Processing Operation

Storage Operation

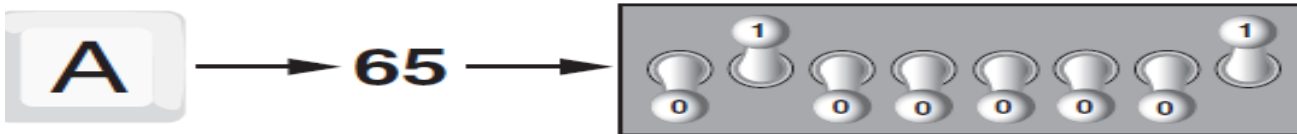
Output Operation

Communication Operation

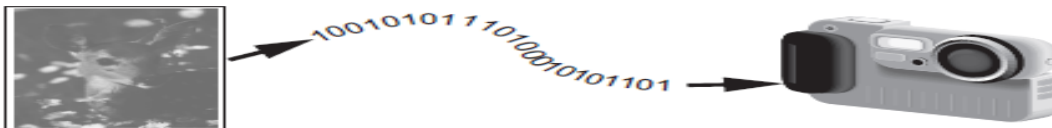
Input Operation

- Menerima masukan berbagai macam data
- Contoh: letters, numbers, symbols, shapes, colors, temperatures, sounds, pressure, light beams or whatever raw material needs processing

4 The letter A is stored in memory as the number 65



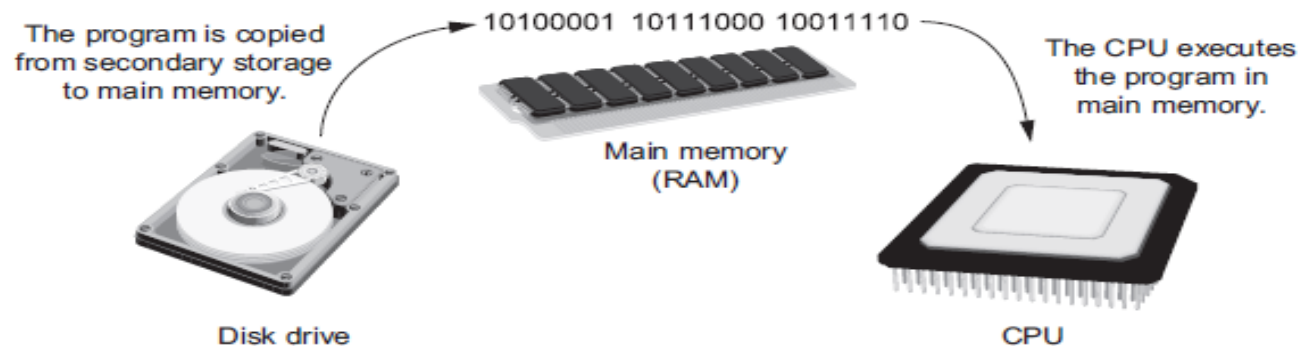
A digital image is stored in binary format



Processing Operation

- Manipulasi komputer dalam melakukan transformasi data menjadi informasi
- Pemrosesan dilakukan oleh (Central Processing Unit)

-16 A program is copied into main memory and then executed



Storage Operation

Primary Storage

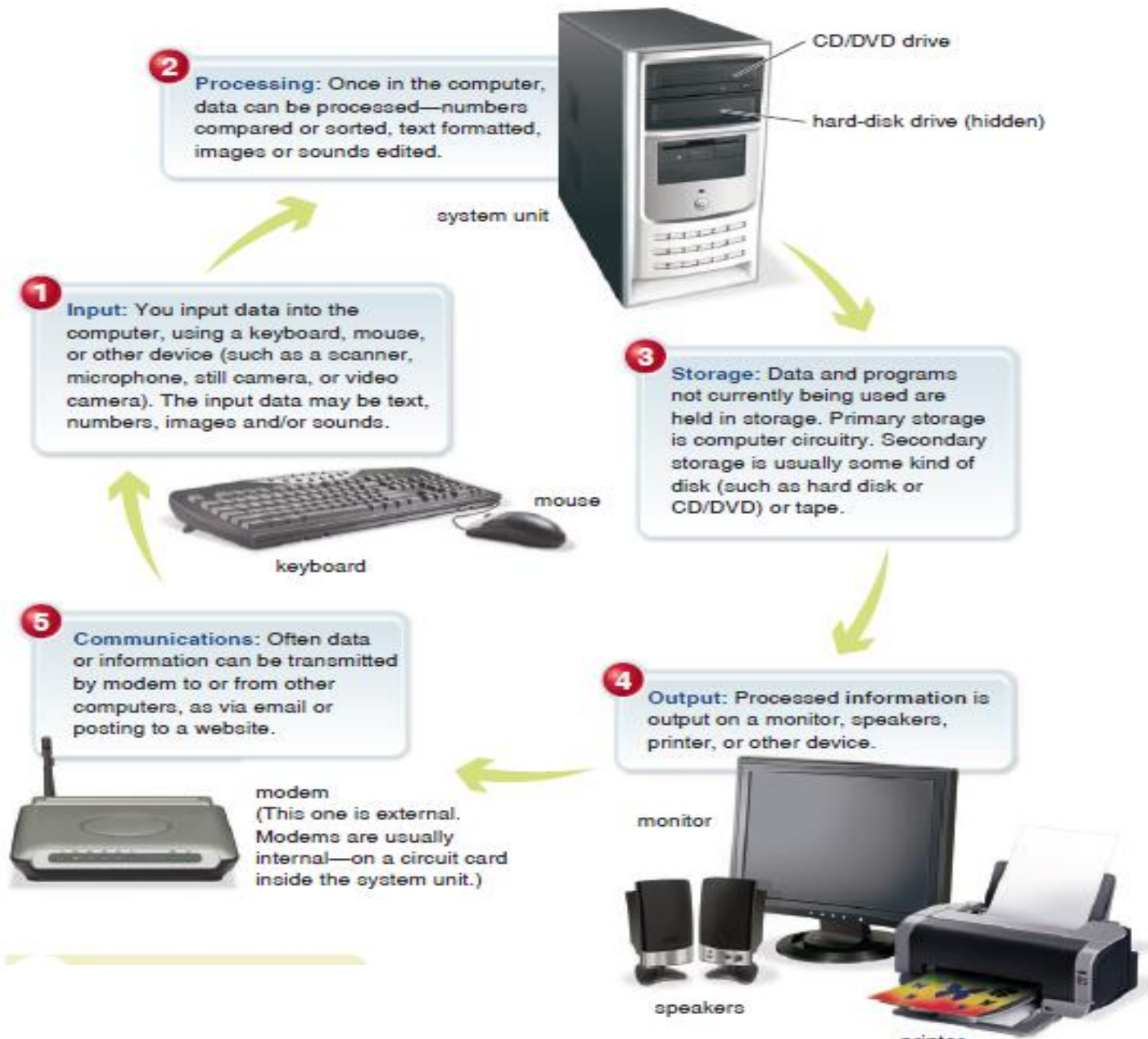
- Operasi penyimpanan data pada komponen internal komputer yang menyimpan data sementara menunggu untuk diolah

Secondary Storage

- Operasi yang menyimpan data /informasi secara permanen pada media penyimpanan sekunder

Output Operation

- Menampilkan hasil pengolahan, berupa informasi
- contoh : Hasil berupa angka atau gambar pada layar, naskah yang tercetak dikertas oleh printer



Communication Operation

- Menghubungkan komputer ke komputer lain/perangkat lain.
- Memungkinkan data untuk diisikan dari jarak jauh
- Memungkinkan pemrosesan dilakukan di lokasi terpisah
- Memungkinkan penyimpanan dilakukan di lokasi terpisah
- Memungkinkan hasil bisa ditampilkan di lokasi lain

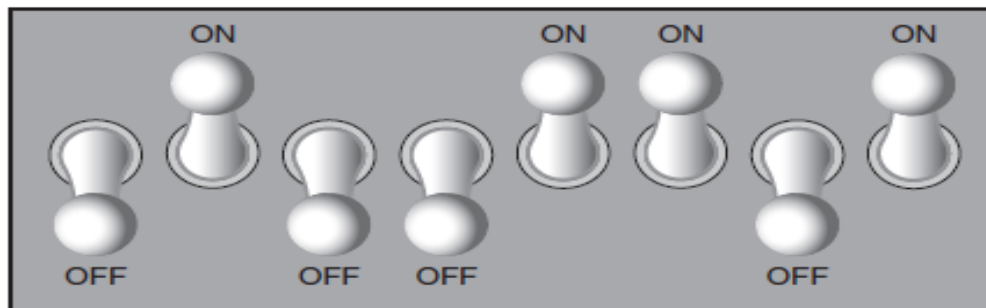
How Computers Store Data

- All data that is stored in a computer is converted to sequences of 0s and 1s
- A computer's memory is divided into tiny storage locations known as bytes.
- One byte is only enough memory to store a letter of the alphabet or a small number
- In order to do anything meaningful, a computer has to have lots of bytes. Most computers today have millions, or even billions, of bytes of memory.
- Each byte is divided into eight smaller storage locations known as bits(binary digit).
- Computer scientists usually think of bits as tiny switches that can be either on or off.
- In most computer systems, bits are tiny electrical components that can hold either a positive or a negative charge.
- Computer scientists think of a positive charge as a switch in the on position, and a negative charge as a switch in the off position.

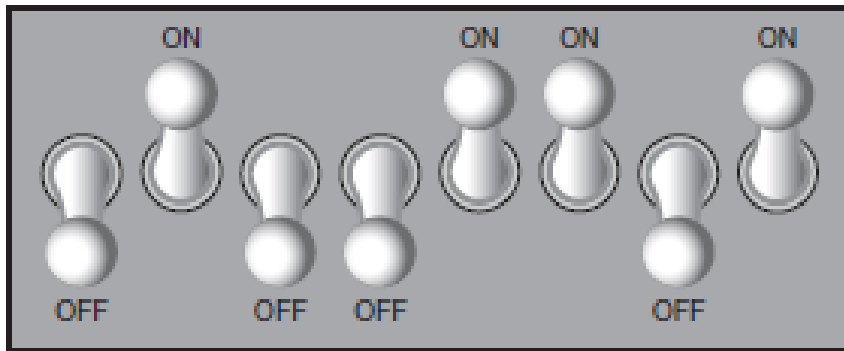
How Computers Store Data

- When a piece of data is stored in a byte, the computer sets the eight bits to an on/off pattern that represents the data.

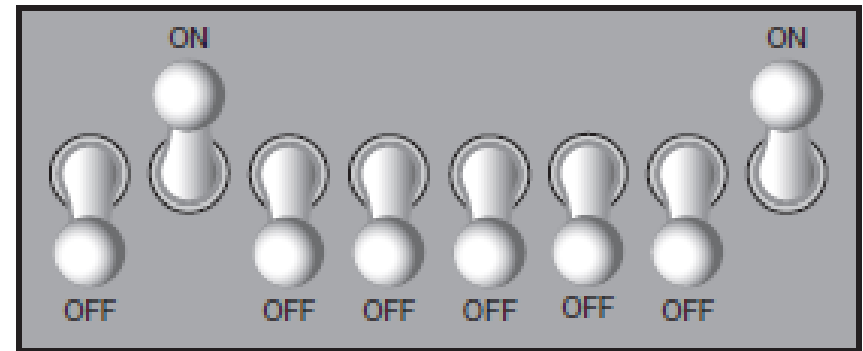
Think of a byte as eight switches



1-8 Bit patterns for the number 77 and the letter A

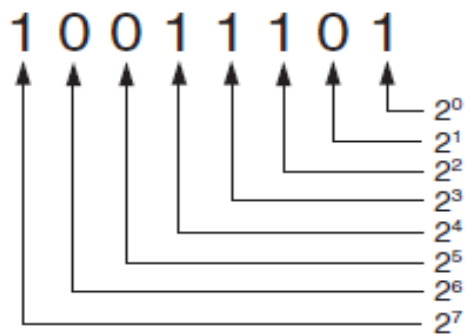


The number 77 stored in a byte.

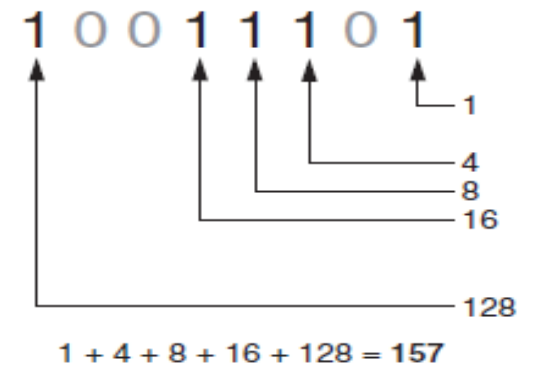


The letter A stored in a byte.

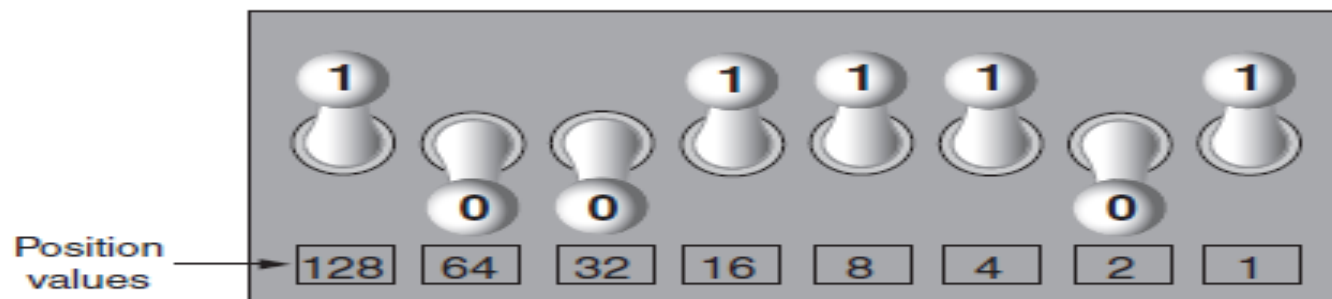
The values of binary digits as powers of 2



Determining the value of 10011101



The bit pattern for 157

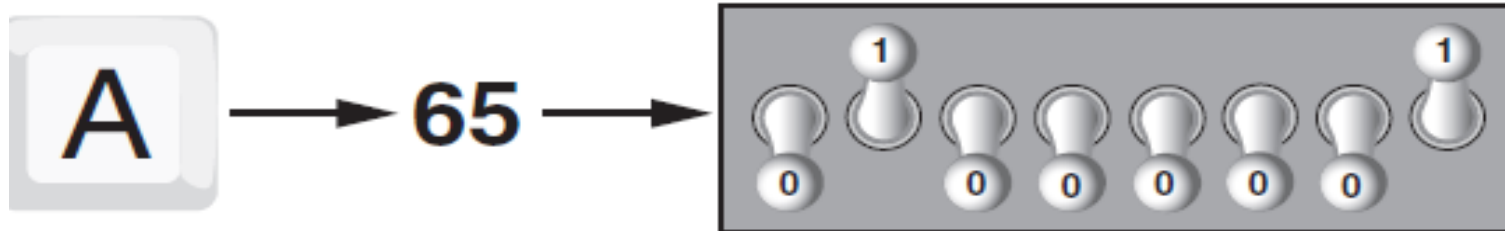


$$128 + 16 + 8 + 4 + 1 = 157$$

ASCII (*American Standard Code for Information Interchange.*)

- ASCII is a set of 128 numeric codes that represent the English letters, various punctuation marks, and other characters.

4 The letter A is stored in memory as the number 65



A digital image is stored in binary format



1001010111010010101101



Computer Programming

- A computer is a programmable machine. This means it can execute a programmed list of instructions and respond to new instructions that it is given.
- Computer Programming is the process of developing and implementing various sets of instructions to enable a computer to do a certain task.
- Programs are written to solve problems or perform tasks on a computer.
- Programmers translate the solutions or tasks into a language the computer can understand

Tugas

1. Tuliskan ringkasan untuk perkembangan teknologi dari perangkat-perangkat berikut ini:
 - Microprocessor
 - RAM
 - Secondary Storage/penyimpanan Sekunder
 - Input/Output
 - Komunikasi
 2. Tuliskan naskah tentang teknologi *cloud computing*, teknologi *quantum*.
- *Keterangan:*
 - *Dikerjakan secara kelompok (1kelompok:3 orang)*
 - *kirim via email suprayogi@dsn.dinus.ac.id*
 - *Paling lambat 29 sept 2017*