# Chapter 1

## Short Answer

1. Why is the CPU the most important component in a computer?

Because it is the part of the computer that runs programs.

2. What number does a bit that is turned on represent? 1

What number does a bit that is turned off represent? 0

3. What would you call a device that works with binary data?

A digital device

4. What are the words that make up a high-level programming language called?

Key words, or reserved words

5. What are the short words that are used in assembly language called?

Mnemonics

6. What is the difference between a compiler and an interpreter?

Compilers translate code into machine language.

Interpreters translate into machine language and execute.

7. What type of software controls the internal operations of the computer’s hardware?

Operating System.

## Exercises

### 1. Convert the following decimal numbers to binary:

11

|  |  |  |  |
| --- | --- | --- | --- |
| 8 | 4 | 2 | 1 |
| 1 |  | 1 |  |

Answer: 1010

65

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 64 | 32 | 16 | 8 | 4 | 2 | 1 |
| 1 |  |  |  |  |  | 1 |

Answer: 1000001

100

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 64 | 32 | 16 | 8 | 4 | 2 | 1 |
| 1 | 1 |  |  | 1 |  |  |

Answer: 1100100

255

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Answer: 11111111

### 2. Use what you’ve learned about the binary numbering system in this chapter to convert the following binary numbers to decimal:

1101 = 13 = (1 × 2³) + (1 × 2²) + (0 × 2¹) + (1 × 2⁰)

1000 = 8 = (1 × 2³) + (0 × 2²) + (0 × 2¹) + (0 × 2⁰)

101011 = 43 = (1 × 2⁵) + (0 × 2⁴) + (1 × 2³) + (0 × 2²) + (1 × 2¹) + (1 × 2⁰)

### 3. Look at the ASCII chart in Appendix A and determine the codes for each letter of your first name.

Mark = 077 097 114 107

mark = 109 097 114 107

### 4. Use the Web to research the history of the BASIC, C++, Java, and Python programming languages, and answer the following questions:

* BASIC
  + John Kemeny, Tom Kurtz
  + 1964
  + To expand the use of computers beyond math/science
* C++
  + Bjarne Stroustrup
  + 1985
  + To improve the C language based on features from Simula
* Java
  + James Gosling
  + 1995
  + Intended to run anywhere that supported Java after being compiled. No idea what his motivation was.
* Python
  + Guido van Rossum
  + 1991
  + I’ve no idea what his motivation was. Probably just scratching an itch he had with existing languages.