# 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.

# Chapter 2

## True or False

1. Programmers must be careful not to make syntax errors when writing pseudocode programs.

False - technically there’s no syntax to pseudocode.

2. In a math expression, multiplication and division take place before addition and subtraction.

True

3. Variable names can have spaces in them.

False

4. In most languages, the first character of a variable name cannot be a number.

True

5. The name gross\_pay is written in the camelCase convention.

False - snake\_case

6. In languages that require variable declarations, a variable’s declaration must appear before any other statements that use the variable.

True

7. Uninitialized variables are a common cause of errors.

True

8. The value of a named constant cannot be changed during the program’s execution.

True

9. Hand tracing is the process of translating a pseudocode program into machine language by hand.

False

10. Internal documentation refers to books and manuals that document a program, and are intended for use within a company’s programming department.

True

## Short Answer

1. What does a professional programmer usually do first to gain an understanding of a problem?

Discuss with client/customer

2. What is pseudocode?

A way to describe the way a program will work using plain English, without having to worry about the syntax of a programming language.

3. Computer programs typically perform what three steps?

Handle input, processing and output of data.

4. What does the term user-friendly mean?

That something is easy for the typical end-user to understand and operate.

5. What two things must you normally specify in a variable declaration?

Type and value.

6. What value is stored in uninitialized variables?

Depends. In some languages it will hold the value, if any, of the content of the stack space. For all intents and purposes though, unitialized variables have no value.