Chapter 1 The Big Picture (全景）

- 作业 1：The History of computing software
  Book page of 8
- 作业 2.The way of Computing Thinking
-

Chapter 2 Binary Values and Number Systems （二进制和数字系统）

For Exercises 12 -17, mark the answers true and false as follows:

A. True

B. False

12. Binary numbers are important in computing because a binary number can be converted into every other base.
    B
13. Binary numbers can be read off in hexadecimal but not in octal.
    B
14. Starting from left to right, every grouping of four binary digits can be read as one hexadecimal digit.
    B
15. A byte is made up of six binary digits.
    B
16. Two hexadecimal digits can be stored in one byte.
    A
17. Reading octal digits off as binary produces the same result whether read from right to left as left to right.
    A

Chapter 3 Data Reprensentation (数据表示方法）

For Exercises 1- 20, mark the answers true and false as follows:

A. True

B. False

1. Lossless compression means the data can be retrieved without losing any of the original information.
   A
2. A computer represents information in an analog form.
   B

3. A computer must use the binary number system to represent information.
   B
4. A digital signal represents one of two values at any point in time.
   A
5. Four bits can be used to represent 32 unique things.
   B
6. The signed-magnitude representation of numbers has two representations for zero.
   A
7. Overflow occurs when the value that we compute cannot fit into the number of bits we have allocated for the result.
   A
8. In the ASCII character set, there is no distinction made between uppercase and lowercase letters.
   B
9. The Unicode character set includes all of the characters in the ASCII character set.
   T
10. Keyword encoding replaces frequently used words with a single character.
    T
11. Run-length encoding is very good at compressing English text.
    B
12. Huffman encoding uses variable-length binary strings to represent characters.
    A
13. An audio signal is digitized by sampling it at regular intervals.
    A
14. A CD stores audio information in a binary format.
    A
15. The MP3 audio format discards information that can't be heard by humans.
    A
16. An RGB value represents a color using three numeric values.
    A
17. Indexed color increases the number of colors that can be used in an image, and thus increases the file size.
    B
18. Bitmap, GIF, and JPEG are all examples of raster-graphics formats.
    A
19. Vector graphics represent images in terms of lines and geometric shapes.
    A
20. A keyframe is used in temporal compression to represent the changes from one frame to another.
    B

Homework 2: Answer the questions. Why is data compression an important topic today?

Data compression refers to reducing the amount of space needed to store a piece of data. Although computer storage is relatively cheep, as the amount of data keeps increasing rapidly the cost of storage is a factor. However, the most important reason for compressing data is that more and more we share data. The Web and its

underlying networks have limitations on bandwidth that define the maximum number of bits or bytes that can be transmitted from one place to another in a fixed amount of time.

Homework 3: Answer the questions; What is the difference between lossless and lossy data compression?

A lossless data compression is one in which no information is lost. A lossy data compression is one in which some information may be lost.

Chapter 4 Gates and Circuits

For Exercises 1 - 17, mark the answers true and false as follows:

A. True

B. False

1. Logic diagrams and truth tables are equally powerful in expressing the processing of gates and circuits.
   A
2. Boolean expressions are more powerful than logic diagrams in expressing the processing of gates and circuits.
   B
3. A NOT gate accepts two inputs.
   B
4. The output value of an AND gate when both inputs are 1 is 1.
   A
5. The AND and OR gates produce opposite results for the same input
   B
6. The output value of an OR gate when both inputs are 1 is 1.
   A
7. The output of an OR gate when one input is 0 and one input is 1 is 0.
   B
8. The output value of an XOR gate is 0 unless both inputs are 1.
   B
9. The NOR gate produces the opposite results of the XOR gate.
   B
10. A gate can be designed to accept more than two inputs.
    A
11. A transistor is made of semiconductor material.
    A
12. Inverting the output of an AND gate is equivalent to inverting the individual signals first, then passing them through an OR gate.
    A (Demorgan's law)
13. The sum of two binary digits (ignoring the carry) is expressed by an AND gate.
    B
14. A full adder takes the carry-in value into account.

A

15. A multiplexer adds all of the bits on its input lines to produce its output.

B

16. Integrated circuits are classified by the number of gates contained in them.

A

17. A CPU is an integrated circuit.

A

Chapter 5 Computing Components

Homework 1: Describe the basic characteristics of a von Neumann computer architecture.

memory, arithmetic/logic unit, input/output units, the control unit， and so on

Homework 2: Answer the questions. Explain the three primary ways that parallel-processing systems are used for more efficient problem solving.

There are multiple processors applying the same program to multiple data sets.

Multiple processors are arranged in tandem. Each processor contributes one part of the overall processing.

Multiple processors do different processing with different data but communicate through the use of shared global memory.

Chapter 7 Probem Solving and Algorithm Design

Homework 1: match the activity with the phase of the object-oriented methodology

A.Brainstorming

B.Filtering

C.Scenarios

D.Responsibility algorithms

1.Reviewing list of possible classes， looking for duplicates or missing classes

2.Asking “what if”questions

3.Assgining responsibilities to classes

4.Generating a first approximation to the list of classes in a problem

5.Assigning collaborators to a responsibility

63. Show the state of the list when firstUnsorted is first set equal to the 4th item in the selection sort. Array when firstUnsorted is first set to 4th item.

[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
2	9	19	20	23	90	41	34	66	40	99

64. Show the state of the list when firstUnsorted is first set equal to the 5th item in the bubble sort algorithm.

Array when firstUnsorted is first set equal to the 5th item.

[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
2	9	19	20	23	41	66	34	40	90	99

65. Show the state of the list when the first recursive call is made in Quicksort using list[0] as split value.

Array when first recursive call is made.

[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
2	19	9	20	23	90	66	34	41	40	99

Chapter 6、9 Programming Languages

For Exercises 1- 15, mark the answers true and false as follows:

A. True

B. False

1. Arithmetic can be performed in the Instruction Register.
   B
2. Arithmetic can be performed in the A Register.
   A
3. Arithmetic can be performed in the accumulator.
   A
4. LDA 0X008B,i loads 008B into register A.
   A
5. ADDA 0x008B,i adds the contents of 008B to the A register.
   B
6. The Program Counter and the Instruction Register are two names for the same place.
   B

7. The A register and the accumulator are two names for the same place.
   A
8. The Instruction Register is three bytes long.
   A
9. The Program Counter is three bytes long.
   B
10. The branch instruction, BR, branches to the location specified in the operand specifier.
    A
11. The instruction specifier is one bytes long.
    B
12. If the data to be loaded into the accumulator is stored in the operand, the instruction specifier is 00.
    A
13. If the data in the accumulator is to be stored in the place named in the operand, the instruction specifier is 00.
    B
14. All Pep/8 instructions occupy three bytes.
    B
15. At least one branching instructions is required in a loop.
    A

Homework 2: Answer the questions. Where is the data (operand) if the address mode specifier is:
A. 000 B. 001

A. in the instruction specifier

B. in the place named in the instruction specifier

Homework 3：Match the question with the appropriate translation or execution system.

For Exercises 11–24, match the question with the appropriate translation or execution system.
A. Interpreter
B. Assembler
C. Compiler
D. Machine code

11. What translates a high-level language into machine code?
    C
12. What translates a Java program into Bytecode?
    C
13. What executes Bytecode?
    A
14. What translates an assembly language program?
    B
15. What is the output of an assembler?
    D

16. What takes input in a high-level language and directs the computer to perform the actions specified in each statement?
    A
17. What executes the Java Virtual Machine?
    D
18. What is used to translate a program in ALGOL?
    C
19. What is used to translate a program in APL?
    A
20. What is used to translate a program in COBOL?
    C
21. What is used to translate a program in FORTRAN?
    C
22. What is used to translate a program in Lisp?
    A
23. What is used to translate a program in PROLOG?
    A
24. Which translator runs the most slowly?
    A

Homework 3: Distinguish between imperative and declarative paradigms.

An imperative language describes the actions to be taken to solve the problem. A declarative language describes the solution expected but not the steps to be taken.

Chapter 8 Abstract Data Type

Write out the definition and properties of words list below.

•Definitions:

•Stacks(246),Queues(247),Lists(248),Trees(251),Graphs(260),Subprograms(268)

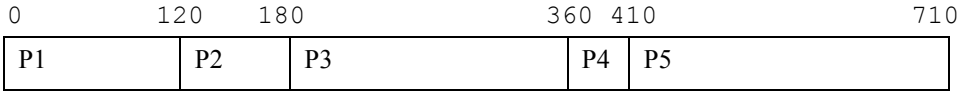
Chapter9- 10 Operating Systems

Draw Grant charts and calculate each average turn around time.

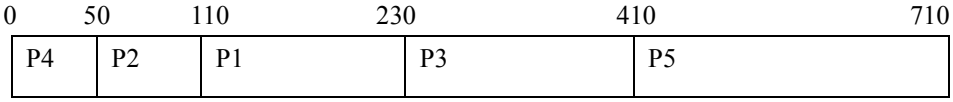
process	P1	P2	P3
Service time	120	60	180

Use the table of processes and service time, draw Grant charts show the completion times for each process using FCFS, SJN and Round-robin CPU scheduling with the time slice of 60, and calculate each average turn around time.

Draw a Gantt chart that shows the completion times for each process using first-come, first served CPU scheduling.



Draw a Gantt chart that shows the completion times for each process using shortest-job-next CPU scheduling.



71. Draw a Gantt chart that shows the completion times for each process using round-robin CPU scheduling with a time slice of 60.

Chapter 15\16 Networks and WWW

Homework 1：A:True B:False

1. A port is a numeric designation that corresponds to a particular high-level protocol.
   A
2. A firewall protects a local-area network from physical damage.
   B (it protects it from inappropriate access)
3. Each company can establish its own access control policy.
   A
4. Some top-level domains are based on the country in which the registering organization is based.
   A
5. Two organizations cannot have the same name for a computer.
   B

Homework 2:What is a computer network?

A computer network is a collection of computing devices connected so that they can communicate and share resources.

Homework 3:What is the difference between the Internet and the Web?

The Internet is a wide area network that spans the earth. The Web is the infrastructure of distributed information and network software that lets us use the Internet more easily.