Computer Science Exam Style Questions

**Chapter 1**

**Section A**

1. Outline three methods that can be used to prevent data loss. [2]
2. State the difference between alpha testing and beta testing. [2]
3. Outline three problems that may happen during data migration. [2]

**Section B**

1. Mr. Evgenii is an economic teacher at a high school in Beijing. He intended to mark students’ exam paper with his laptop. Mr. Evgenii needs to know how to operate his laptop. The laptop company usually have user documentation for its end-users
2. Name two types of user documentation and discuss what a good user documentation should be. [3]

Mr. Evgenii uploaded all the photocopies of the exam paper to the cloud.

1. State the name of this method to prevent data loss and discuss the possible causes of data loss. [3]

There is a specialized application for teachers to mark their students’ papers and Mr. Evgenii really enjoys using this it.

1. Discuss the possible consequences if the producer of this application fails to involve their end-user. [2]

A few days later, Mr. Evgenii found that there was a new version of application available.

1. State and evaluate this installation process. [3]

**Chapter 4**

**Section A**

1. Explain why abstraction is required in the derivation of computational solution for a specified solution. [3]
2. Discuss the two advantages of concurrent programming. [2]
3. Outline the meaning of thinking ahead. [2]

**Section B**

1. There are six students in IB Computer science class and their names are David, David, Charlie, Helen, Hanbo and Jerry respectively.

The teacher needs to find the repetition of the name.

1. Choose a suitable data structure to solve this problem. [1]
2. Construct an algorithm to solve this problem. [3]

On mathematics class, Mr. Ivan talked about mathematical induction which is closely related to computational thinking. He then suggested students who choose computer science should solve Fibonacci problem using computer programming.

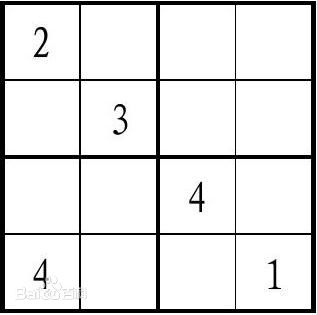
1. Construct an algorithm to find the Nth Fibonacci number (think about recursion).
2. If we try to find the 5th Fibonacci number, how many 2th Fibonacci number appear? Solve this problem with the aid of a trace table.
3. There is an urged need for a printer in the school for students to use. Students in computer science class decided to design an algorithm since they’ve just bought a new printer for their classmates.
4. Discuss about the pre-planning of this algorithm. [3]

When a student wants to print less than 10 pages, he/she has to pay 0.1USD per page. If he/she wants to print more than 10 pages, he/she will get a ten percent discount for the part of more than 10 pages.

1. Construct an algorithm to solve this problem. [3]
2. Demonstrate the algorithm through flow chart. [3]
3. Sudoku is a number-placement puzzle. The objective is to fill a 9×9 grid with digits so that each column, each row, and each of the nine 3×3 subgrids that compose the grid (also called boxes) contains all of the digits from 1 to 9. In this case, we simply the question.
4. construct an algorithm to calculate the sum of all of the number using 2D array.
5. A subgrid is composed of all of the digits from 1 to 9 without repetition. Construct an algorithm to check whether there is repetition. If there is, output TRUE, if not, output FALSE.

In order to make Sudoku more interesting, there is a mini Sudoku which the number only range from 1 t0 4.

1. Fill the blank space in the mini Sudoku on the right.
2. Construct an algorithm to check whether your result is right or wrong.



**Chapter 5**

**Section A**

1. State the information stored in a linked list. [3]
2. Outline the all the parents, roots, and left children in the binary tree shown below. [3]



**Section B**

1. After the final examination, computer science teacher gets a list of students’ final grades shown in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | David | Charlie | Helen | Hanbo | Jerry |
| Paper1 | 31 | 32 | 33 | 34 | 35 |
| Paper2 | 40 | 39 | 38 | 37 | 36 |

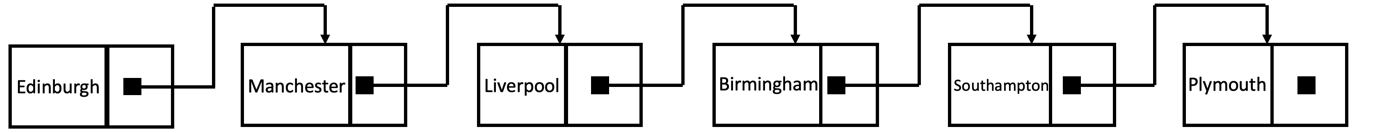
1. Outline the abstract data type of this table. [1]
2. Construct an algorithm to calculate the average final score. [4]
3. Construct an algorithm that calculate everyone’s final score and store them into a list from the smallest to the biggest. [4]
4. In a train station, the details of each train arrive on each day are held in a collection, TRAIN, each object in the collection contains the following information:

ID: unique train number

Departure: the place where the train leave

Destination: the place where the train head

ARRIVED: the time the train arrive



A screen in the train station can display all the information day and night, which are held in a linked list.

1. Describe the feature of a linked list of six trained that have the above information. [3]

Because of mechanic reason, the train head towards Birmingham cannot set out on time. Therefore, it has to be deleted from the linked list

1. With the aid of the diagram, demonstrate how to delete the train heading to Birmingham from the linked list. [4]
2. In this scenario, for example, the train may set out at 10:58 and arrive at 17:34 in the afternoon. Construct an algorithm to calculates how many time (in minutes) it is. [3]
3. For the application described above, contrast linked list and stack. [5]