http://tech.kakao.com/2017/11/14/kakao-blind-recruitment-round-3/

객관식 문제

이름: _____

이메일(프로그래머스 ID): _____

안내사항

1. 객관식 문제는 총 20 문제/100 점으로 구성됩니다.

2. 시험지는 총 11 페이지입니다. (표지 및 답안지 포함)
   파지가 있는지 확인 후, 문제가 있으면 감독관에게 요청 바랍니다.

3. 코딩 문제와 객관식 문제는 별도의 제한시간이 없습니다.
   주어진 4 시간을 재량껏 활용하여 문제를 풀어주시기 바랍니다.

4. 채점은 답안지(11 페이지)로만 진행되고,
   문제지에 표기한 내용은 반영되지 않으니 유의해주시기 바랍니다.
   11 페이지 답안지에는 반드시 성명을 기재해주세요.

Q1 에서 Q10 까지는 *컴퓨팅 및 컴퓨터 과학, 인터넷 등의 기본적인 개념에 대한 영어 위키백과의 설명이다. 각 빈 칸을 채워 넣으시오.*
(문항당 정답은 한 개이며, 단복수형의 구분 무관 및 영문이 아닌 한국어로 번역된 명칭을 적어도 무방함.)

Q1. In computer science, a ( ) of execution is the smallest sequence of programmed instructions that can be managed independently by a scheduler, which is typically a part of the operating system. The implementation of ( ) and processes differs between operating systems, but in most cases a ( ) is a component of a process. Multiple ( ) can exist within one process, executing concurrently and sharing resources such as memory, while different processes do not share these resources. [3 점]

Q2. In multitasking computer operating systems, a ( ) is a computer program that runs as a background process, rather than being under the direct control of an interactive user. Traditionally, the process names of a ( ) end with the letter d, for clarification that the process is, in fact, a ( ), and for differentiation between a ( ) and a normal computer program. For example, *syslogd* is the ( ) that implements the system logging facility, and *sshd* is a ( ) that serves incoming SSH connections. [5 점]

Q3. In computer science, a ( ) is a type of resource leak that occurs when a computer program incorrectly manages memory allocations in such a way that memory which is no longer needed is not released. [3 점]

Q4. In computing, ( ) is a computer program that takes one or more object files generated by a compiler and combines them into a single executable file, library file, or another 'object' file. A simpler version that writes its output directly to memory is called the *loader*, though loading is typically considered a separate process. [3 점]

Q5. The ( ) is a hierarchical decentralized naming system for computers, services, or other resources connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most prominently, it translates more readily memorized domain names to the numerical IP addresses needed for locating and identifying computer services and devices with the underlying network protocols. By providing a worldwide, distributed directory service, the ( ) is an essential component of the functionality on the Internet, that has been in use since 1985. [3 점]

Q6. ( ) uses a simple connectionless communication model with a minimum of protocol mechanism. ( ) provides checksums for data integrity, and port numbers for addressing different functions at the source and destination of the datagram. It has no handshaking dialogues, and thus exposes the user's program to any unreliability of the underlying network; There is no guarantee of delivery, ordering, or duplicate protection. If error-correction facilities are needed at the network interface level, an application may use the Transmission Control Protocol (TCP) or Stream Control Transmission Protocol (SCTP) which are designed for this purpose. [5 점]

Q7. ( ) is a set of Web development techniques using many Web technologies on the client side to create asynchronous Web applications. With ( ), Web applications can send data to and retrieve from a server asynchronously (in the background) without interfering with the display and behavior of the existing page. By decoupling the data interchange layer from the presentation layer, ( ) allows for Web pages, and by extension Web applications, to change content dynamically without the need to reload the entire page. In practice, modern implementations commonly substitute JSON for XML due to the advantages of being native to JavaScript. [5 점]

Q8. A ( ) in the C programming language (and many derivatives) is a composite data type declaration that defines a physically grouped list of variables to be placed under one name in a block of memory, allowing the different variables to be accessed via a single pointer, or the ( ) declared name which returns the same address. In the C++ language, a ( ) is identical to a C++ class but a difference in the default visibility exists: class members are by default private, whereas ( ) members are by default public. [5 점]

Q9. In object-oriented programming, ( ) is when an object or class is based on another object (prototypal ( )) or class (class-based ( )), using the same implementation. ( ) in most class-based object oriented languages is a mechanism in which one object acquires all the properties and behaviors of parent object. [5 점]

Q10. A ( ) symbolizes a unit of work performed within a database management system (or similar system) against a database, and treated in a coherent and reliable way independent of other ( ). A ( ) generally represents any change in a database. ( ) in a database environment have two main purposes: [5 점]

1. To provide reliable units of work that allow correct recovery from failures and keep a database consistent even in cases of system failure, when execution stops (completely or partially) and many operations upon a database remain uncompleted, with unclear status.
2. To provide isolation between programs accessing a database concurrently. If this isolation is not provided, the programs' outcomes are possibly erroneous.

Q11. 아래는 TCP 의 커넥션 종료 과정을 도식화한 그림이다. 빈 칸의 상태에 알맞는 번호를 각각 기입하시오. [10 점]

1) CLOSE_WAIT
2) TIME_WAIT
3) FIN_WAIT_1
4) FIN_WAIT_2

The connection termination phase uses a four-way handshake, with each side of the connection terminating independently. When an endpoint wishes to stop its half of the connection, it transmits a FIN packet, which the other end acknowledges with an ACK. Therefore, a typical tear-down requires a pair of FIN and ACK segments from each TCP endpoint. After the side that sent the first FIN has responded with the final ACK, it waits for a timeout before finally closing the connection, during which time the local port is unavailable for new connections; this prevents confusion due to delayed packets being delivered during subsequent connections.

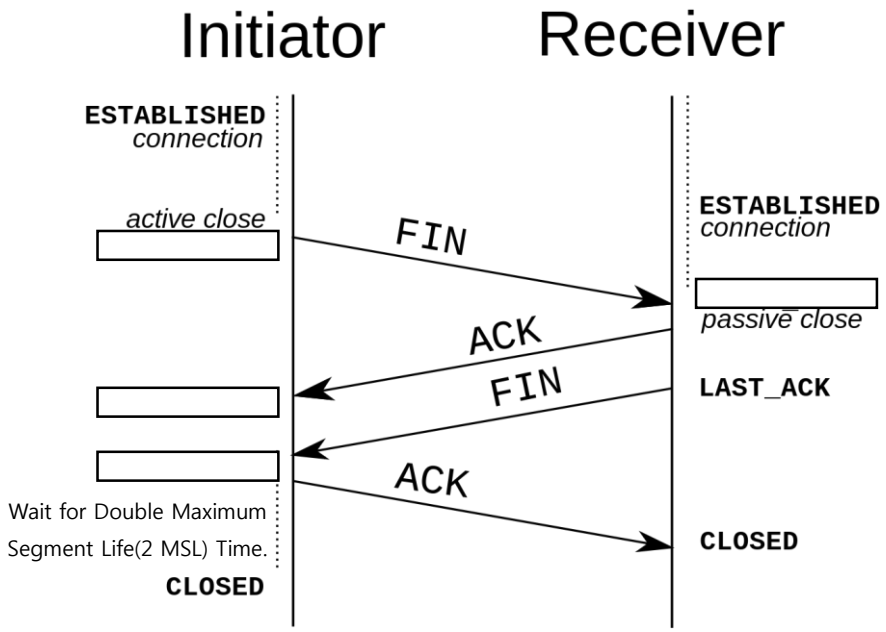
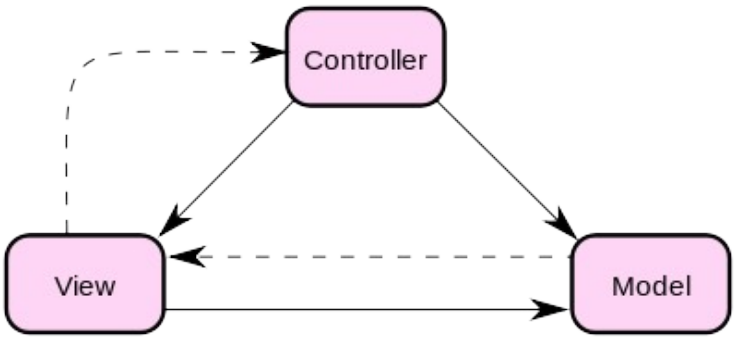


Figure 1 TCP CLOSE (출처: 영문 위키백과)

Q12. 다음은 **Model–view–controller (MVC)** 소프트웨어 디자인 패턴에 관한 설명 중 일부이다. 구성요소에 대한 설명 중 빈 칸에 알맞는 번호를 각각 기입하시오. [5 점]

1) Model
2) View
3) Controller

- The (3) accepts input and converts it to commands.
- A (2) can be any output representation of information, such as a chart or a diagram.
- The (1) is the central component of the pattern. It expresses the application's behavior in terms of the problem domain, independent of the user interface. It directly manages the data, logic and rules of the application.



Q13. 아래 코드의 시간 복잡도는 어떻게 되는가? [5 점]

```
int f(int n) {
    if (n <= 1) {
        return 1;
    }
    return f(n - 1) + f(n - 1);
}
```

1. $O(1)$
2. $O(n)$
3. $O(n \log n)$
4. $O(n^2)$
5. $O(2^n)$

Q14. 아래 코드의 시간 복잡도는 어떻게 되는가? [5 점]

```
int f(int n) {
    int sum = 0;
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n / 2; j++) {
            sum *= j;
        }
    }

    return sum;
}
```

1. $O(1)$
2. $O(n)$
3. $O(n \log n)$
4. $O(n^2)$
5. $O(2^n)$

Q15. 아래는 Queue 로 구현한 Stack 클래스의 자바 코드이다.

```
public class Stack {
  private Queue Q = new Queue();
  public E pop() {
    int k = 1;
    while(k++ < Q.size())
      Q.enqueue(Q.dequeue());
    return Q.dequeue();
  }

  public void push(E o){
    Q.enqueue(o);
  }
}
```

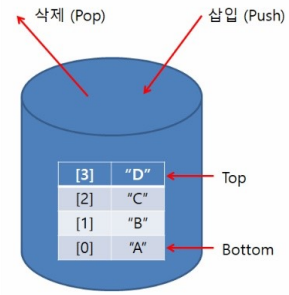
Queue 의 enqueue(o)와 dequeue()의 시간복잡도가 $O(1)$ 일때 Stack 클래스의 push(o)와 pop() 각각의 시간 복잡도를 기입하시오. [7 점]

- **push(o):** $O($ $)$
- **pop():** $O($ $)$

Q16. 중복된 원소가 없는 **서로 길이가 다른** 숫자 리스트 A, B 가 있다. 두 리스트 내에 공통으로 포함된 원소를 출력하고자 한다. 두 리스트 중 한 개를 정렬하고, 다른 리스트를 순회하면서 이진 검색 Binary Search 으로 포함 여부를 체크한다고 할때 어떤 리스트를 정렬하는게 더 빠를지 고르시오. 단, len(A) < len(B) 이며 정렬은 병합 정렬 Merge Sort 을 사용하여 $O(n \log n)$의 시간 복잡도로 진행한다. [5 점]

1. 길이가 짧은 A
2. 길이가 긴 B
3. 상관 없음

Q17. 웹 브라우저의 이전페이지로 돌아가기와 에디터의 되돌리기 Undo 기능을 구현하기에 적합한 자료구조는? [3 점]

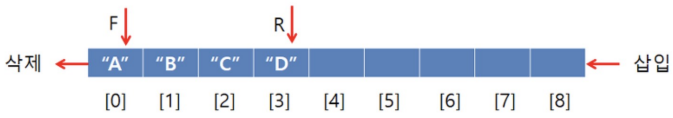


1. Hash
2. Stack `Last-In First-Out`
3. Queue
4. Tree
5. Graph

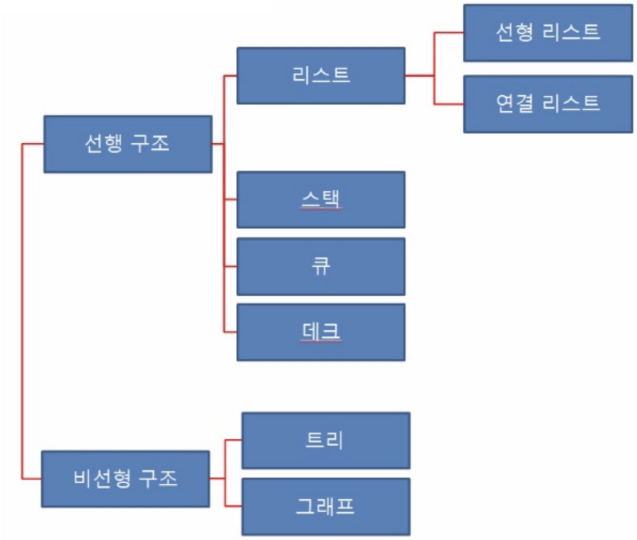
Q18. DB 의 인덱스 Index 는 원하는 레코드 Record 에 빠르게 접근 할 수 있게 해준다. 문자열과 숫자 컬럼에 대한 인덱스를 구현할 때 사용할 수 있는 자료구조를 모두 고르시오. [5 점]

1. Hash
2. Stack
3. Queue
4. Tree
5. Graph

Q19. 새로 가입하는 사용자에게 메일을 보내야 하는데, 실제 가입까지 처리는 10 ms 밖에 걸리지 않지만, 메일을 보내는 시간은 1000 ms 가 소요된다. 이런 경우에 가입자에게 메일을 순차적으로 발송하는 시스템을 구현하기 위한 자료구조로 적합한 것은? [3 점]

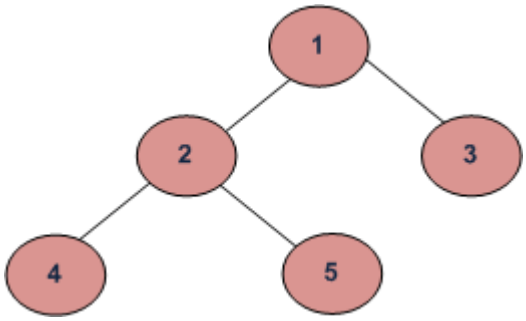


1. Hash
2. Stack
3. Queue `First-In First-Out`
4. Tree
5. Graph



Q20. 트리의 순회 방법 Tree traversal 에는 현재 노드를 언제 순회하느냐에 따라 전위 순회 Pre-order, 중위 순회 In-order, 후위 순회 Post-order 가 있다.

- 전위 순회는 현재 노드를 방문 후 왼쪽 서브 트리, 오른쪽 서브 트리 순으로 전위 순회를 한다.
- 중위 순회는 왼쪽 서브 트리를 중위 순회한 후 현재 노드를 방문하고, 마지막으로 오른쪽 서브 트리를 중위 순회한다.
- 후위 순회는 왼쪽 서브 트리, 오른쪽 서브 트리 순으로 후위 순회한 후, 마지막으로 현재 노드를 방문한다.

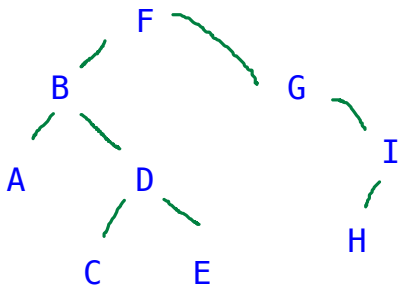


예를 들어, 위와 같은 이진 트리가 주어졌을 때 각각의 순회 결과는 다음과 같다.

- 전위 순회 : 1 2 4 5 3
- 중위 순회 : 4 2 5 1 3
- 후위 순회 : 4 5 2 3 1

이진 탐색 트리의 전위 순회, 중위 순회 결과가 다음과 같을 때,

- 전위 순회: F, B, A, D, C, E, G, I, H
- 중위 순회: A, B, C, D, E, F, G, H, I



후위 순회 결과를 나열하시오. [10 점]

정답: A, (C), E, (D), (B), H, (I), G, (F)