

Beaconfire Inc, Home Work, Week2 Day2.

By (Ping) Nalongsone Danddank.

ndanddank@gmail.com

wechatID: ndanddank

Short Answer:

1. What is Thread and What is Process? What are differences between them?

-> A process is self-contained execution environment. Each processor has own memory space, and complete and private set of basic run-time resource. Usually, we say a process is same application, but a single app may have many cooperating processes inside. And most operating systems support IPC (Inter process communication) resources, such pipes and sockets.

-> A thread is a smallest unit of process or lightweight sub process, and it is a separate path of execution. They are independent, does not affect other threads, like when one thread throw exception, another thread cannot handle that exception, only thread itself can handle own exception.

-> difference: Process means any program is in execution, but Thread means segment of a process. Thread takes less time to terminate ,to create, for context switching, and consume resources less then process. And,Thread is more efficient in term of communication then process. Thread is share memory, but process is isolated.

2. How to create threads in Java?

-> TWO way to create a new thread, extends the thread class, and implement the Runnable interface.

3. Runnable or Thread, which do you prefer to using? Why?

-> first choice should be Runnable interface, because it is more flexible and we can extend any other class and implement more another interface, and Runnable interface can be represented as lambda expression. So, when extending the thread class, we are not overriding any of its methods. Instead, we override the method of Runnable. And when we creating an implementation of runnable and passing it to the thread classbu utilizes agregation/composition and not inheritance.

4. What are differences between start() and run()?

-> when a program calls the start method, a new thread is created and then executed the code in the run() method. But if the program directly call the run() method then no new thread will be created and run method will be executed as same on the current thread and no multi-treading will take place.

Start() method is defined in java.lang.Thread class, but run() method is defined in java.lang.Runnable interfave and must be overriden in the implementing class.

5. What if invoking start() method of a thread twice? What if invoking run() method twice?

-> if invoking start() method of a thread in second time, JVM will throw java.lang.IllegalStateException. So we cannot invoke twice. but invoking run() method is possible.

6. What is Thread Life Cycle in Java? Explain how to get to each stage.

-> first, when state of thread when we initilize is new state, but not started, then when call the start() method, the change to runnable or ready to run, and continue change to running if the schedule to run, but when the thread is blocked but some reasons like waiting for some event occur, sleeping, join, IO...

and when the blocked state complete or get notify, the state will return to be ready to run state again. Finally, if the the thread complete mission or terminate, the state of thread will go to be dead state.

7. Explain join() method in Java Thread.

-> allows one thread to wait for the completion of another thread that running this thread. But join is dependent on the OS for timing, so you should not assume that join will wait exactly as long as you specify.

8. What are differences sleep() and wait()?

-> sleep() uses for pausing on the execution, by wait() use for inter-thread communication. Wait() is release the lock or monitor, but sleep() is not.

9. What is Daemon thread in Java? Why do we need it?

-> like a normal thread but it is a low priority thread, it provides services to user thread for background supporting tasks. It has no role in life than to serve user threads. JVM will terminates the Daemon thread automatically when user threads dies, because its life depend on the mercy of user threads.

10. What is thread interference? Give an example.

-> Thread interference is one kind of errors of thread communicate by sharing access to field and the objects reference fields refer to. The interference happens when two operations, running in different threads, but action on the same data, interleave. This means that the two operations consist of multiple steps, and the sequences of steps overlap. And some situation list thread A is calling increment and thread B is calling decrement, this is also called Race Condition.

11. What are some of the ways to perform Thread Synchronization?

-> two ways: using synchronized keyword with method definition, and using synchronized keyword with any block of code.

12. What is Deadlock? How to resolve it?

-> Deadlock is the situation that when one thread try to access the resource that need the lock from another, so it was block because in the same time that another thread need the lock for access to the resource from another one that was block or waiting for get the lock too.

-> there are 3 ways that we can solve it: first, prevention or avoidance like eliminate Mutual Exclusion, eliminate, hold and wait,, no preemption, and circular wait; second, detection and recovery, and last is ignore the problem altogether.

13. What are the differences between SynchronizedMap and ConcurrentHashMap?

-> SynchronizedMap, it locks the whole map, slow performance, null key and multiple null values are allowed. But ConcurrentHashMap, it locks only portion of map, so it faster performance, and null key and values are not allowed.

14. What is a Singleton class?

-> is a class that can have only one object at a time. That means after we create the instance of the singleton class in the first time, the instance object will live through the all programming while running. And it was modified, it is visible through programming.