Short Answer

Answer the following questions with complete sentences in your own words. You are encouraged to conduct your own research online or through other methods before answering the questions. If you research online, please consult multiple sources before you write down your answers. You are expected to be able to explain your answers in detail

1. How to create a new Thread in Java
2. What is Executor Service
3. Difference between shutdown and shutdownnow
4. Difference between invokeAll and invokeAny
5. What is CompletableFuture
6. Difference between Future and CompletableFuture
7. Can you name some methods in Completablefuture
8. What is CountDownLatch, CyclicBarrier, Semaphore
9. What is @Async

Coding Questions

Write code in Java to solve following problems. Please write your own answers. You are highly encouraged to present more than one way to answer the questions. Please follow best practice when you write the code so that it would be easily readable, maintainable, and efficient. Clearly state your assumptions if you have any. You may discuss with others on the questions, but please write your own code.

1. In your HR project, which request takes the longest time? Try to improve it with @Async.

2. Using ExecutorService and Future, create a method that takes in an int array and uses one thread to compute the sum of the left half of the array (indexes 0 to (n-1)/2, where n is the length of the array) and another thread to compute the sum of the right half of the array (indexes n/2 to n-1). Return the two computed sums as an int array.