2a)
The function takes in a function providing a BigInt, and a boolean.
The function prints the value provided by f if b is true.
t is a lazy variable storing the value provided by f, so it is not evaluated until it's used; f is not computed until println(t) is reached.
b)
If we use val instead of lazy val, the value of f would be calculated regardless of b (f would be called), and the result would not be used if b is false, but using lazy evaluation, f is only called if b is true.
c)
It's a useful optimization to only calculate the values when they are needed. (avoiding calculating values that won't be used)
d)
start is a function from () => Unit where unit can be regarded as the same as void in java. Mapping an array of threads with start would produce an array of Unit, basically an array of nothing. It's more common to use forEach when mapping an array with a function returning Unit.
e)
Two threads may call the method on the same time, which will result in only one of the increases to count. Both threads read the value of counter, and then increments it. This operation consists of three steps, Read a, a + 1, write a+1 to a. If thread 1 reads a and computes a+1, but thread 2 reads a before thread 1 writes a+1 to a, then thread 2 will later write the same a+1 to a, thus not counting one increment.
f)
Deadlock is two (or more) threads blocking each other, e.g. thread 1 waits for some value or lock from thread 2, and thread 2 waits for some value or lock from thread 1. (a cyclic relationship).