Programming paradigms

Tutorials 04

1. Using examples different than on lecture explain the difference between sum and product ADT (Algebraic Data Type)
2. Create ADT which represents days of week and functions isWeekendDay(…), isWorkDay(…) tor this structure. What type of ADT is better to use for this task (sum/product)?
3. Explain why we call it hybrid ADT:

```
sealed trait Notification
final case class Email(sender: String, title: String, body: String) extends Notification
final case class SMS(caller: String, message: String) extends Notification
final case class VoiceRecording(contactName: String, link: String) extends Notification
```

4. Explain difference between function calls: call by value and call by name.
5. Explain how operators `&&` and `||` work
6. What will be printed when we call

```
def something() = {
  println("calling something")
  1 // return value
}
```

as parameter of functions

```
def callByValue(x: Int) = {
  println("x1=" + x)
  println("x2=" + x)
}

def callByName(x: => Int) = {
  println("x1=" + x)
  println("x2=" + x)
}
```

7. What will be printed by function

```
object Main extends App {
  val fibs: LazyList[BigInt] =
    BigInt(0) #:: BigInt(1) #::
      fibs.zip(fibs.tail).map{ n =>
        println(s"Adding ${n._1} and ${n._2}")
        n._1 + n._2
      }
  fibs.take(5).foreach(println)
  fibs.take(6).foreach(println)
}
```

8. Explain the idea of Null Safety (Kotlin) and why it is popular in modern langs?
9. Explain the idea of Extension Functions (Kotlin) and how they are implemented on JVM level?