16-124-836
Marcel ZAUDER

3.1 Why does the piece of code not raise an error?

Because of using *"lazy load/execution"* in functional programming this code would not raise an error. This is because when defining *funcl y z = y*, z is not needed for executing this computation. Therefore the *sqrt(-5)* is not considered for the output and therefore no error occurs.

3.2 Small Program Definition

```
if n = 0 then
    return -1
else
    return n*2
```

3.2.1 Pattern Matching

```
pattern 0 = -1
pattern n = n*2
```

3.2.2 Guards

```
guards n | n == 0  = -1
         | n >= 1  = n*2
```

3.2.3 Lambda Expression

```
lambda = ( \n -> if n == 0 then -1
          else n*2 )
```

3.3 Program that computes the sum of all members of a list

```
listsum[] = 0
listsum(x:xs) = x + listsum xs

main = print $ listsum[1,2,3,4,5,6,7,8,9]
```

3.4 Catalan Numbers in Haskell

```
fac 0 = 1
fac n = n * fac (n-1)

getList n = [0..n]
catalan n = fac (2*n) / (fac(n+1) * fac(n))

firstNcatalan n = map catalan (getList(n-1))

main = print $ firstNcatalan 17
```