Functional Programming

- Exercises are given every week on the PL page of the SCG website (http://scg.unibe.ch/teaching/pl)
- Solutions to each assignment must be sent to mohammadreza.hazhirpasand@inf.unibe.ch
- The solutions of the assignments are to be delivered before every Thursday at 5 PM. Solutions handed in later than the specified time will not be accepted. In case of serious reasons send an e-mail to mohammadreza.hazhirpasand@inf.unibe.ch

Exercise (6 points)

- Explain why the following piece of code does not raise an error. (1 pts)
  
  ```plaintext
  func1 5 z = 33
  func1 y z = y
  func1 50 (sqrt(-5))
  – output is 50
  ```

- Define the following small program in three different functions with pattern matching, guards, and lambda expression. (1.5 pts)
  
  ```plaintext
  if n = 0 then
    return -1
  else
    return n * 2
  ```

- Define a function that accepts a list as an argument and returns the sum of all the members of the given list. (1.5 pts)
• Define a function \texttt{firstNCatalan \: n} in Haskell that calculates and returns the result as a list containing the first \( n \) Catalan numbers. Catalan numbers are calculated based on the formula
\[
C_n = \frac{(2n)!}{(n+1)!n!}, \quad n \geq 0.
\] (2 pts)