Informatik für Mathematiker und Physiker   HS16

Exercise Sheet 3

Submission deadline: 15:15 - Tuesday 11th October, 2016
Course URL: http://lec.inf.ethz.ch/ifmp/2016/

Assignment 1 – Evaluating Expressions (5 points)

(i)	`n / f * d`	[Exam Summer 2016]
(ii)	`u == 4 * ++d`	[Exam Spring 2016, slightly adapted]
(iii)	`0 < d < 2 || 2 > f`	
(iv)	`0 < 1 && 1 != 1 || ++x > 3`	[Exam Spring 2014]
(v)	`3 * d > d || 1 / z != 0 && 3 + 4 >= 7`	[Skript-Aufgaben 32-33, slightly adapted]

For each one, state the *type* and *value*! You should solve this exercise without the help of Codeboard, just as you are asked to do in exams. Once you computed the results yourself, you can of course check by implementing the expressions in Codeboard. If the results don't match, try to find the mistake. In the beginning of each sub-task, assume the following initializations:

```
int d = 2;          int u = 4;
int f = 5;          int x = 3;
int n = 9;          int z = 0;
```

Remark: When you are writing your own programs, you should usually avoid writing too complex expressions. They can make your code unreadable and it's easy to get well-hidden mistakes. Some of the above expressions should indicate this!

Assignment 2 – Cross Sum (4 points)   [Skript-Aufgabe 48]

Write a program `cross_sum.cpp` that inputs a natural number n (including 0) and outputs the sum of the (decimal) digits of n.

I/O-Examples   (Explanation: http://lec.inf.ethz.ch/ifmp/2016/codeboard.html)

652
`Cross sum of 652 is:` *13*

86400
`Cross sum of 86400 is:` *18*

Submission: https://codeboard.ethz.ch/ifmp16E3T2

Assignment 3 – Reverse Binary Representation (4 points) [Skript-Aufgabe 47]

Write a program `dec2bin.cpp` that inputs a natural number n (including 0) and outputs the binary digits of n in *reverse* order.

I/O-Examples (Explanation: http://lec.inf.ethz.ch/ifmp/2016/codeboard.html)

2
```
Reverse binary representation is: 01
```

12
```
Reverse binary representation is: 0011
```

Submission: https://codeboard.ethz.ch/ifmp16E3T3

Challenge - Even Connected Subsequences (8 points) [Skript-Aufgabe 53]

This week's challenge is exercise 53 from the script. In Addition to what the exercise description says, you can assume that the user enters 2 to indicate the end of the sequence.

To implement your program, please refer to the description on how you can write your own programs.