Solutions
Exercises: Binary world

1) **Create a 8-bit binary representation of the decimal number 23**

   23 : 2 = 11 Rest 1
   11 : 2 = 5 Rest 1
   5 : 2 = 2 Rest 1
   2 : 2 = 1 Rest 0
   1 : 2 = 0 Rest 1
   ----> 10111

2) **Create a decimal representation of the binary number 10111111**

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
= 128	= 64	= 32	= 16	= 8	= 4	= 2	= 1
1	0	1	1	1	1	1	1

   => $1*2^7 + 1*2^5 + 1*2^4 + 1*2^3 + 1*2^2 + 1*2^1 + 1*2^0$ =
   128 + 32 + 16 + 8 + 4 + 2 + 1 =
   191

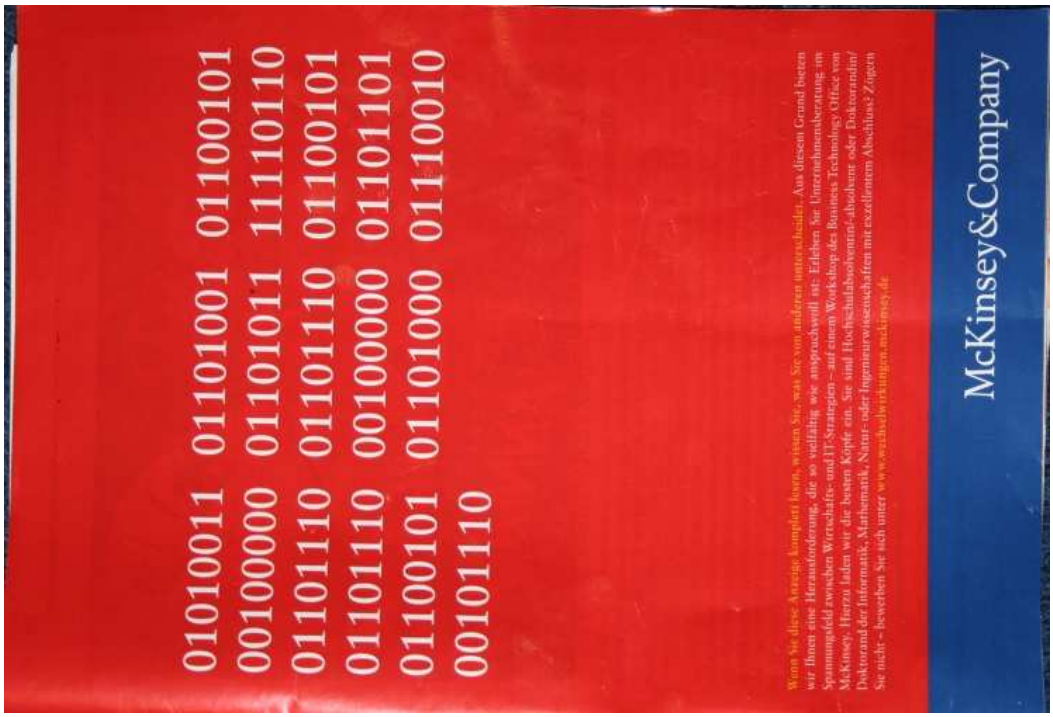
3) **What is the difference between the representation 0011 0111 and 0000 0111 of the number 7?**

   00110111 is the ASCII character representation
   00000111 is the binary integer representation

4) **How can you easily get the binary representation of an ASCII-number representation?**

   e.g. character '9'
   '9' - '0' (use the binary operation – to subtract the ASCII representations like they would be binary representations)
   $00111001_{ASCII} – 00110000_{ASCII} = 00001001_{BIN} = 9_{DEC}$

5) Which text is coded in the following advertisement poster and which code is used?



Code in decimal notation:

83	105	101
32	107	246
110	110	101
110	32	109
101	104	114
46		

=> Sie können mehr.

=> ANSI ISO 8859 Part1 (Latin-1 Western European) - code

Check it with Matlab-program:

```
a = [83 105 101 32 107 246 110 110 101 110 32 109 101 104 114 46];
char(a)
```