UNIVERSITY OF PRIMORSKA

Faculty of Mathematics, Natural Sciences and Information Technologies

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Systems 1

Tutorials in assembly language

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Contents

1 Numbers ...

1.1 Converting between number systems

Convert the following decimal numbers first to 16-bit binary and then to hexadecimal representation:

a) 67   b) 49155   c) 65534

Convert the following 16-bit hexadecimal numbers first to binary and then to decimal representation:

a) 1000   b) ABCD   c) FFFF

1.2 Number spaces

How many different numbers can we write with this many bits?

a) 8   b) 10   c) 16   d) 20   e) 32

How many bits do we need, to address:

a) 14 B   b) 64 KB   c) 1 MB   d) 100 MB   e) 1 GB

Suppose we have a 16-bit addressing space. Divide this space into 4 blocks of equal sizes. Write down the first and the last address of each block. *We will write hexadecimal addresses with the prefix* 0x.

How many addresses are between 0x1000 and 0x2000 including the starting and the ending address?

We want to store 1000 numbers, each number at its own address, starting with the address 0x0200. What is the address of the last number?

1.3 Computer arithmetic

Calculate the sums of hexadecimal numbers:

a) A + B   b) A781 + 1942   c) A000 + 7000

Suppose we operate with 16-bit numbers only. What is then the result of addition A000 + 7000?

In the 16-bit number space let $x = $ 0xA123. Which number in that space is equivalent to $-x$, i.e. for which number $y = -x$ it holds $x + y = 0$?