The Concept of „Software"

"Software" Definition

MVV59K Software Law
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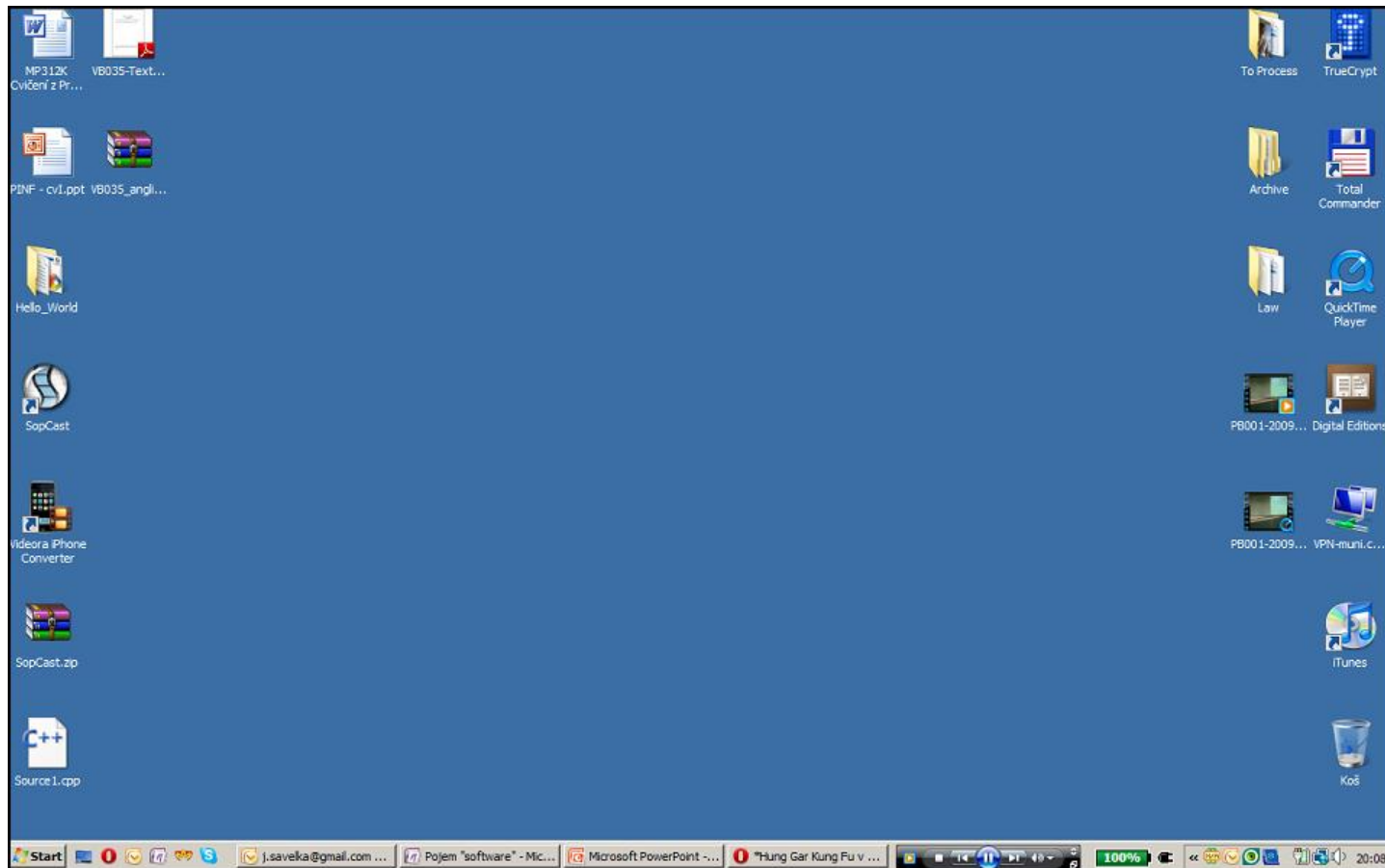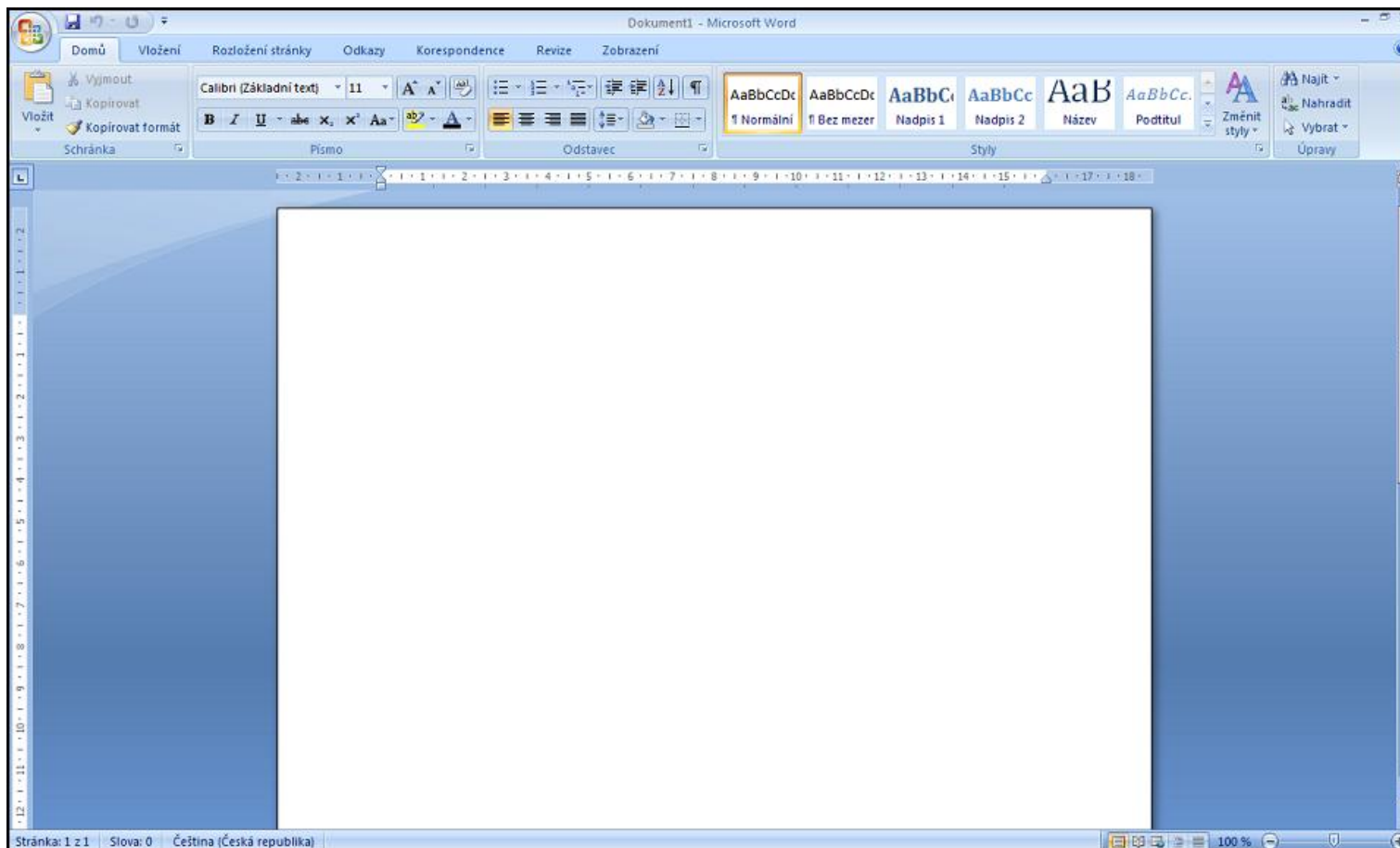
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- **Introduce „Software" as a term with multiple meanings**

- **Explain basic terms connected to**
  - Computer hardware
  - Computer software

What is software?

```
0000001010101000000000000101000001010000000100100010001000100101100101010101
0101010010010000000000000000000000000000000000000011000000000000000000011010000
0000000000000000011010000000000000000000101010000000000000000001111100000000000
0000000000000000000011000011100011000010001000000000000000011001000011010001100011
1000011010101111101111101111101111100000000000000000000000010000000000000000001
0000000000000000000000000100000000000000001111110000000000000001111100000000
0000000000000001100001100001110001100010000000100000000010000110100001100011110
011010111110111110111110111110000000000000000000000000010000001100000000010000
000000110000000000000000010000011000000000011111100000011000001111100000000011
0000000000000011000000100000100000100000011000000010000000110000110000110000100
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0001100000010000001000000100000001000001000000110000000010001000000000110000
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0011011000000000000000000000000000011100000100000000000000011101010001011
010101010011100000000010101010000000000000000101000000000000000011111100000000000
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```
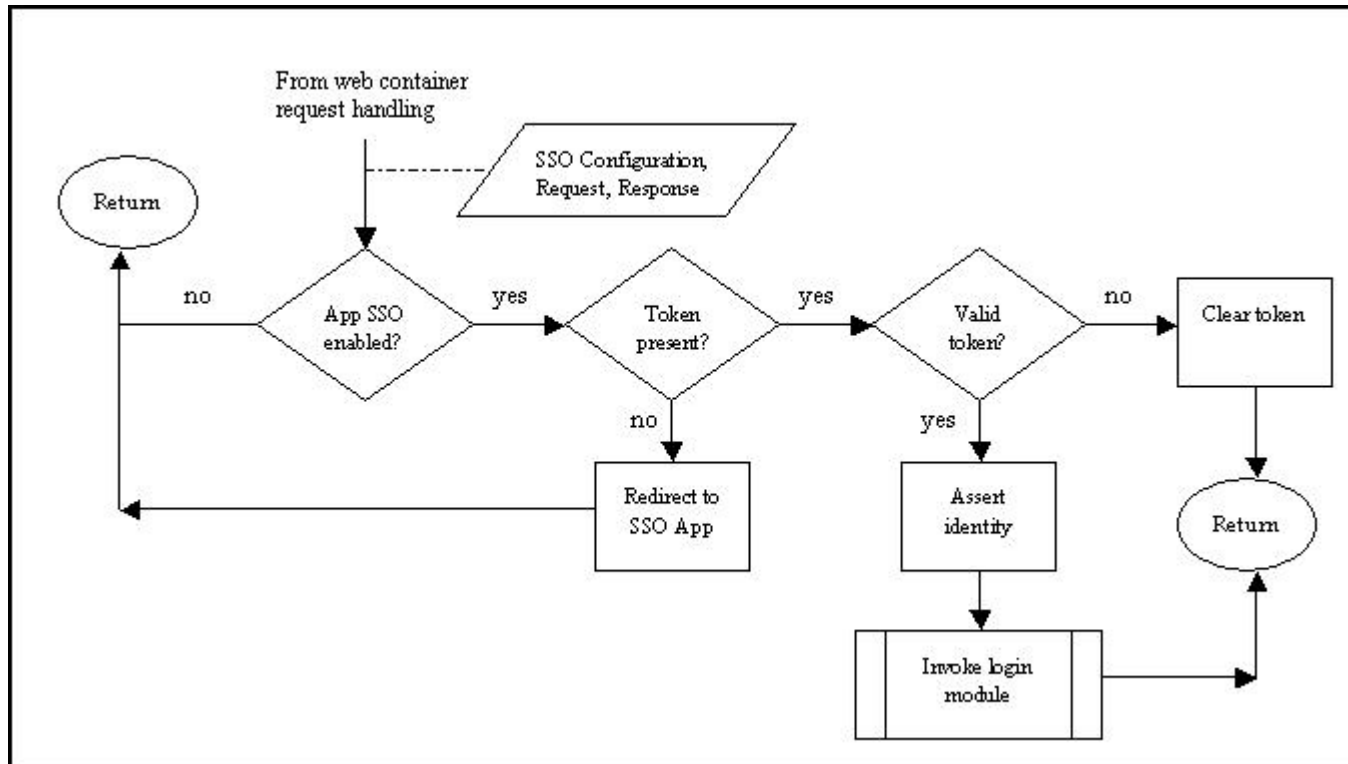
```
//---------------------------------------------------------------------------

// double Tap_to_DB(__int16 Tap, __int16 TotalTaps);
// input:  Tap -- __int16, Tap should be greater then 0 and less than TotalTaps.
//               If Tap equal to TotalTaps, the result should be negative infinity
//          TotalTaps -- __int16, TotalTaps should bigger than 0
// output: Function will returns the dB value as double

double Tap_to_DB(__int16 Tap, __int16 TotalTaps)
{
        __int16   tmp_a;
        double dB_Value, tmp_b;

        // Check input value
        tmp_a = Tap;
        if(Tap >= TotalTaps)  tmp_a = TotalTaps - 1;
        if(Tap < 1)           tmp_a = 1;

        // Convert to dB value
        tmp_b = (double)(TotalTaps - tmp_a);
        tmp_b = tmp_b / (TotalTaps - 1);
        dB_Value = 20 * log10(tmp_b);

         return(dB_Value);
}
//---------------------------------------------------------------------------
```

What is software?

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Definition #1

Software is a set of all computer programs used by a computer.

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Definition #2

Anything that is not hardware but is used with hardware.

Definition #3

Computer software, or just software is a general term used to describe the role that computer programs, procedures and documentation play in a computer system.

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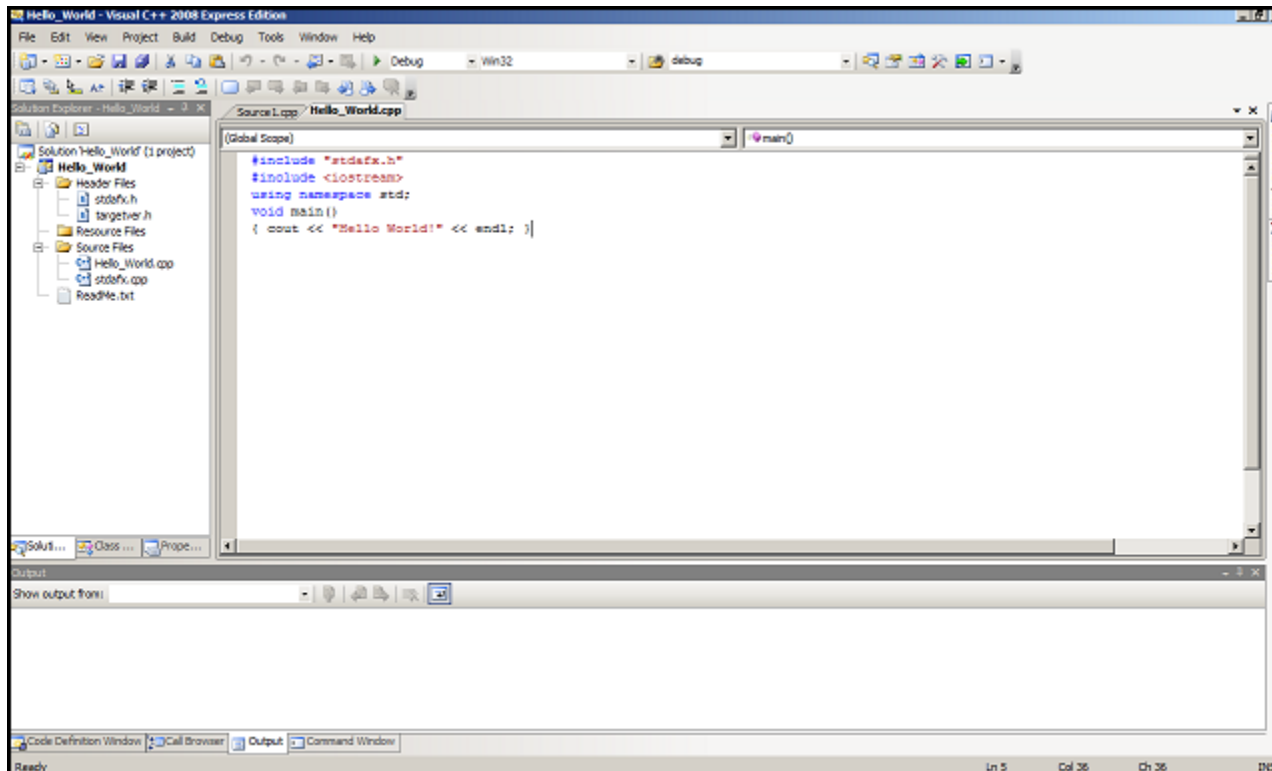
What is software?

Example

- **Central processing unit (CPU)**
  - Arithmetic logic unit (ALU)
  - Control unit
- **Memory**
  - Internal
  - External
- **Input devices**
- **Output devices**

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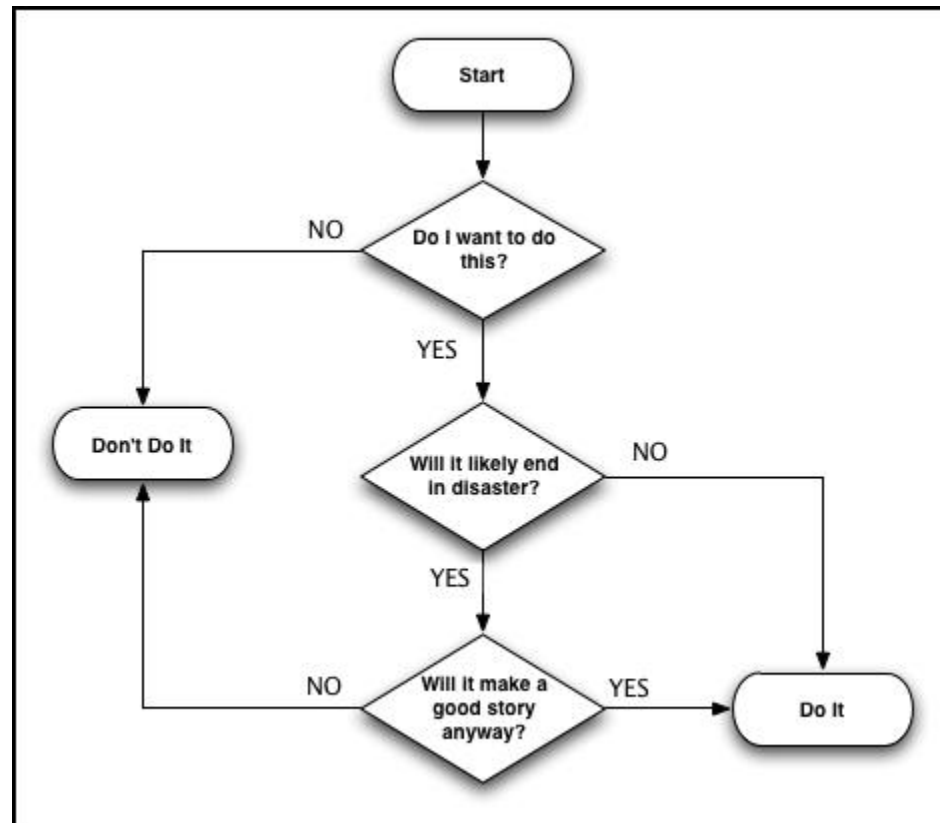
Compilation

source code – binary code

ASCII

(American Standard Code for Information Interchange)

H - 72	e - 101	l - 108	l - 108
o - 111	- 32	W - 87	o - 111
r - 114	l - 108	d - 100	! - 33

- **Processing of the binary code by the computer**

- **Output – audio, video**

- **Instructions**
  - intended for a computer

- **Data**
  - perceptible by human
  - specifically structured for a computer
    (data structures)

- **Operating systems**
  - Management of internal functions of a computer
  - Facilitation of application programs usage

- **Application programs**
  - Compatibility with OS
  - Applications programming interface
  - Enable users to accomplish specific tasks

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- **„Software" is a term with multiple meanings (no universal definition)**

- **Basic terms:**

    (CPU, Memory, I/O devices, Source code, Binary code, Compilation, ASCII, Instructions, Data, Data structures, Operating systems, Application programs, Application user interface, ...)