

# Programming 1

## lesson 2

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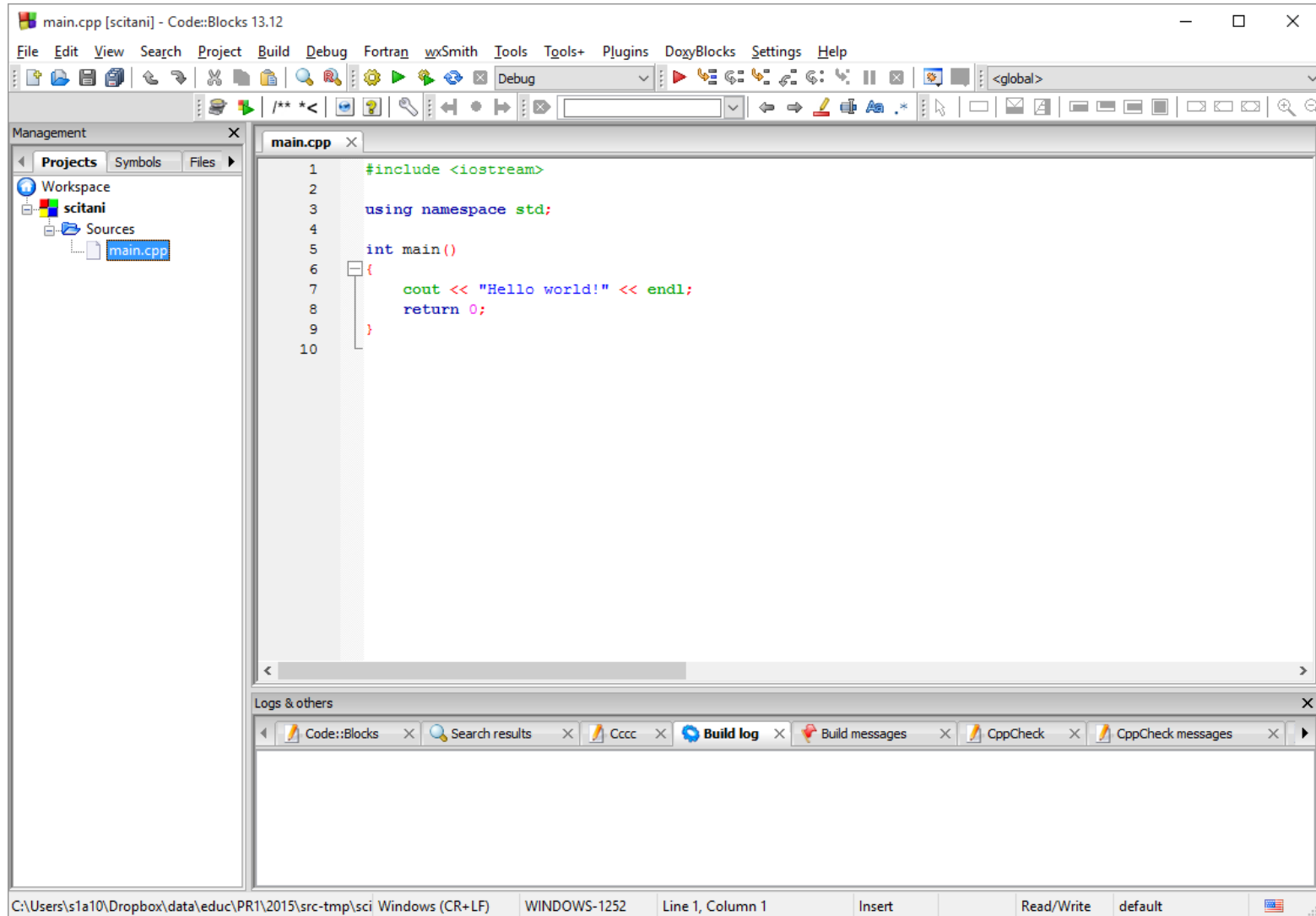
# Kontakt

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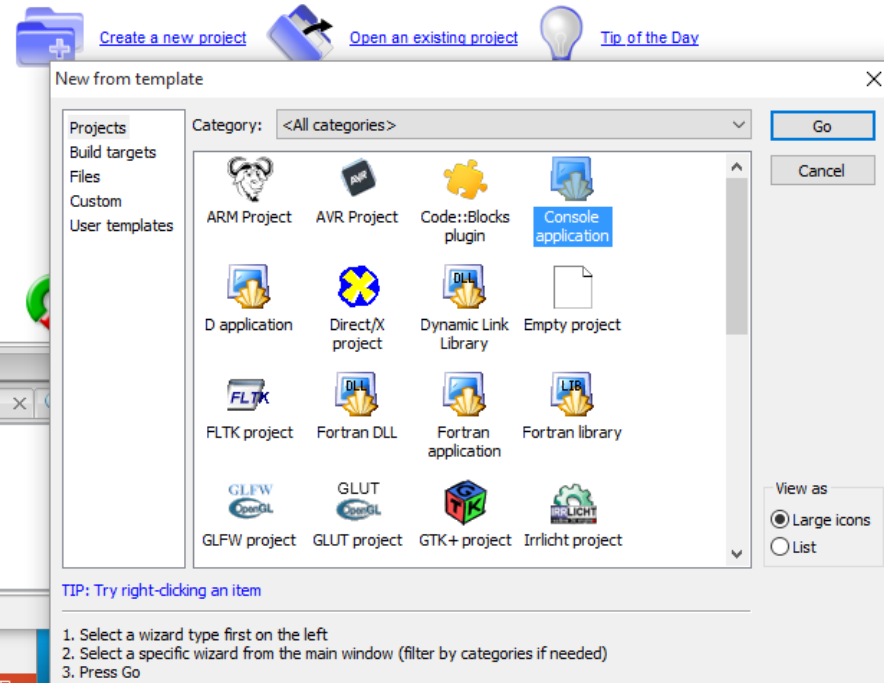
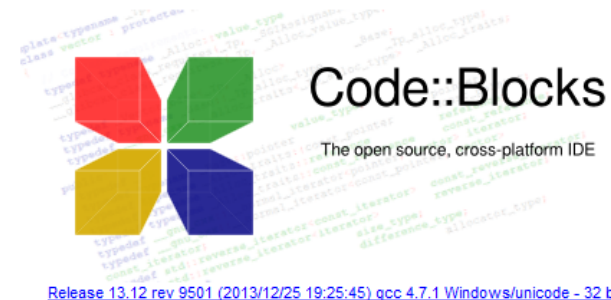
# Developing environment

CodeBlocks + gnu C++



# Type of project

- Console application
- C++ code
- Project name (exercise-2a, exercise-2b, exercise-3a, ...)
- Working directory (local on, USB stick, not shared/mapped from the fakulty (it contains spaces, long path, possibly accents))



# Project's Translation and Run

The screenshot displays the Code::Blocks IDE interface. The main editor window shows the source code for `main.cpp`:

```
1  #include <iostream>
2
3  using namespace std;
4
5  int main()
6  {
7      cout << "Hello world!" << endl;
8      return 0;
9  }
10
```

A terminal window is open, showing the output of the program:

```
C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\scita...
Hello world!
Process returned 0 (0x0)   execution time : 0.025 s
Press any key to continue.
```

The bottom status bar shows the build log, indicating the execution of the program:

```
----- Run: Debug in scitani (compiler: GNU GCC Compiler)-----
Checking for existence: C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\scitani\bin\Debug\scitani.exe
Executing: "C:\Program Files (x86)\CodeBlocks\cb_console_runner.exe" "C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\scitani\bin\Debug\scitani.exe" (in C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\scitani\.)
```

# Simple programm

- Optional comment
  - Used libraries
  - Name space
  - main() function
  - Main function body
  - Return expression
- 
- Compilers log
  - Placement of the project (drive and directory)



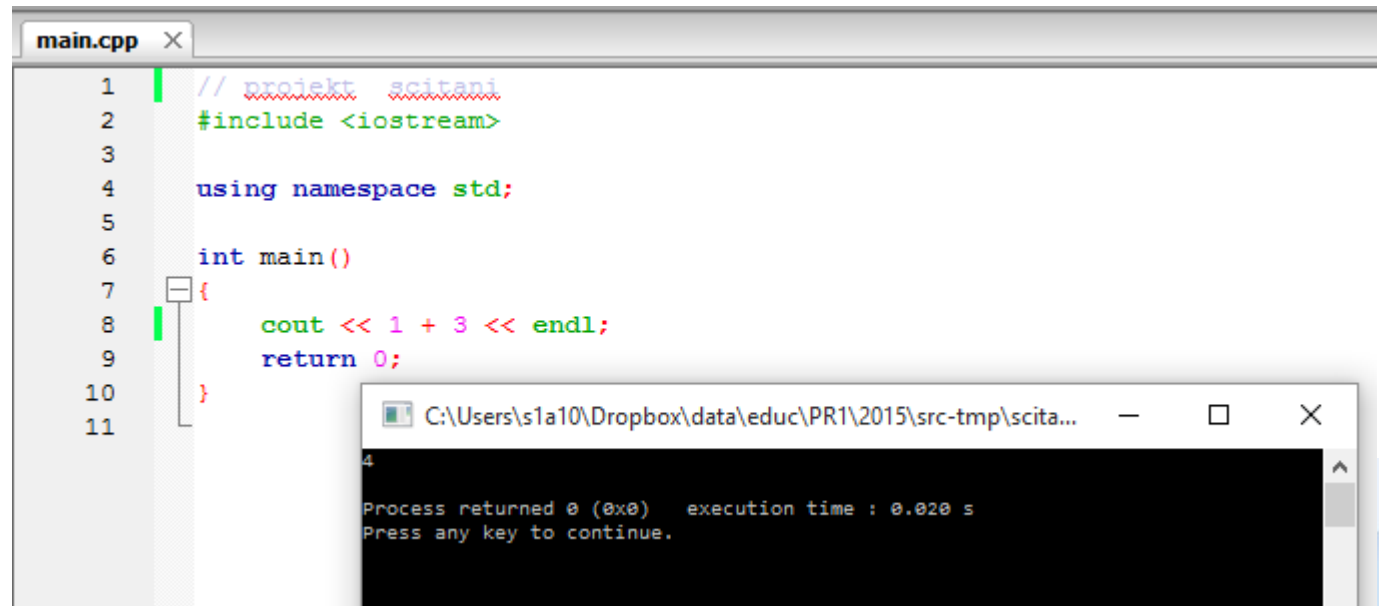
# Task 1

Sum  $1 + 3$



# Task 1 - solution

- 1 + 3 naive
- Output of the result



```
main.cpp x
1 // projekt scitani
2 #include <iostream>
3
4 using namespace std;
5
6 int main()
7 {
8     cout << 1 + 3 << endl;
9     return 0;
10 }
11
```

C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\scita...  
4  
Process returned 0 (0x0) execution time : 0.020 s  
Press any key to continue.



# Task 2

- Sum 1 + ahoj



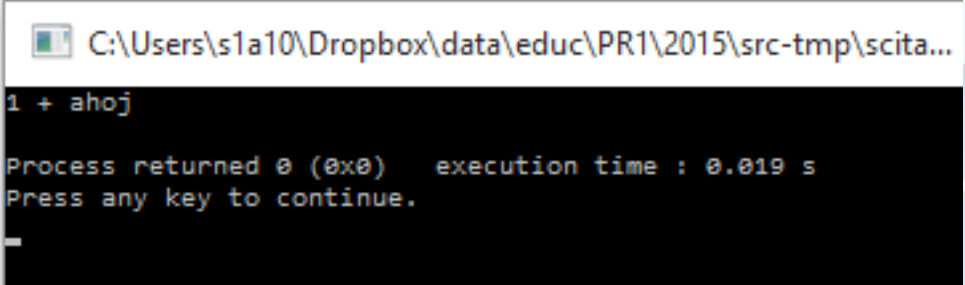


# Task 2

Not all ideas are meaningful 😊

- Possible solution

```
1 // projekt scitani
2 #include <iostream>
3
4 using namespace std;
5
6 int main()
7 {
8     cout << 1 << " + " << "ahoj" << endl;
9     return 0;
10 }
11
```



# Data type

- int – integers
- double – real numbers
- string – text (string)





# Task 3

Number of seconds in a year?

- (approximately 31536000)

```
cout << "rok ma: " << 31536000 | << " sekund" << endl;
```

Preciselly (astronomically) have one tropical year = **31 556 926 seconds**

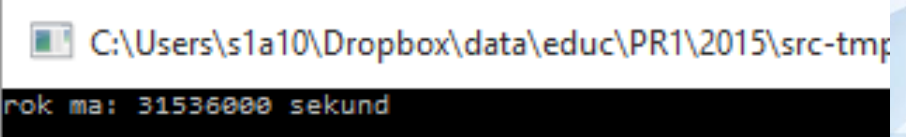
<http://www.jednotky.cz/cas/tropicky-rok/>



# Task 3 (cont)

- solution

```
1 // projekt scitani
2 #include <iostream>
3
4 using namespace std;
5
6 int main()
7 {
8     const int minuta = 60;
9     const int hodina = 3600;
10    const int den = 86400;
11    const int rok = 31536000;
12
13    cout << "rok ma: " << rok << " sekund" << endl;
14    return 0;
15 }
16
```

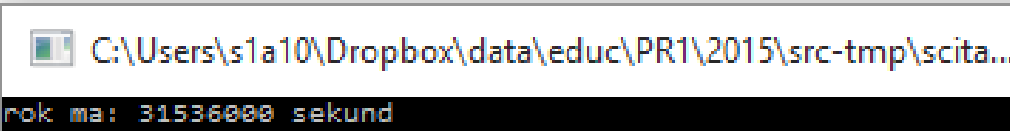


C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp  
rok ma: 31536000 sekund

# Úloha 3 (cont)

- lepší řešení

```
1 // projekt scitani
2 #include <iostream>
3
4 using namespace std;
5
6 int main()
7 {
8     const int minuta_sekund = 60;
9     const int h_minut = 60;
10    const int hodina_sekund = h_minut * minuta_sekund;
11    const int d_hodin = 24;
12    const int den_sekund = d_hodin * hodina_sekund;
13    const int rok_dnu = 365;
14    const int rok_sekund = rok_dnu * den_sekund;
15
16    cout << "rok ma: " << rok_sekund << " sekund" << endl;
17    return 0;
18 }
19
```



C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\scita...  
rok ma: 31536000 sekund

# Constants

const

Data type

Assignment


value

example:

```
const int minuta = 60;
```



# Task 4

- Sum two values
  
  - ? Type of values (data type)
  - Where the values come from?
  - Where the values should be placed/stored?
  - Do I need the result in the next processing?
- 



# Task 4

- solution

```
1 // projekt_scitani
2 #include <iostream>
3
4 using namespace std;
5
6 int main()
7 {
8     int a, b;
9     cin >> a >> b;
10
11     cout << a + b << endl;
12     return 0;
13 }
14
```

```
C:\Users\s1a10\Dropbox\data\educ\PR1\2015\src-tmp\s
2
3
5
Process returned 0 (0x0) execution time : 16.023 s
Press any key to continue.
```

# Variables

- Data type
  - int
  - double
  - string
- identifier
  - characters, numbers, underscore (best practices)



# Programme - algorithm

- Discussion
  
- repeatable activity
- abstraction
- formalization
- - syntax
- - semantics
- 



# Tasks for this week

- Reading from the input  
cin                    >>
- Writing to the output  
cout                   <<
- Basic arithmetical operations  
+, -, \*, /

