

Table 1 presents the 15 IDEs that were found in our research and considered valid for analysis in this study: CLion¹, NetBeans², Code::Blocks³, CodeLite⁴, Eclipse CDT⁵, KDevelop⁶, Geany⁷, Anjuta DevStudio⁸, Qt Creator⁹, DialogBlocks¹⁰, Zinjal¹¹, GPS¹², Oracle Developer Studio¹³, Sphere Engine¹⁴ and AWS Cloud9¹⁵.

Furthermore, for our study were also analyzed 3 Build Automation Tools: CMake¹⁶(v. 3.11.0), qmake¹⁷(v. 3.0) and Qbs¹⁸(v.1.4.5).

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- 1 <https://www.jetbrains.com/clion/specials/clion/clion.html>
 - 2 <https://netbeans.org/>
 - 3 <http://www.codeblocks.org/>
 - 4 <https://codelite.org/>
 - 5 <https://www.eclipse.org/cdt/>
 - 6 <https://www.kdevelop.org/>
 - 7 <https://www.geany.org/>
 - 8 <http://anjuta.org/>
 - 9 <https://www.qt.io/>
 - 10 <http://www.anthemion.co.uk/dialogblocks/>
 - 11 <http://zinjai.sourceforge.net/>
 - 12 <https://www.adacore.com/gnatpro/toolsuite/gps>
 - 13 <https://www.oracle.com/tools/developerstudio/index.html>
 - 14 <https://sphere-engine.com/>
 - 15 <https://aws.amazon.com/pt/cloud9/>
 - 16 <https://cmake.org/>
 - 17 <http://doc.qt.io/qt-5/qmake-manual.html>
 - 18 <https://wiki.qt.io/Qbs>

IDE Name	Studied Version	Usage Model	License Type	Target Audience
Code::Blocks	17.12-1	Standalone	Free License	Beginner
Geany	1.33	Standalone	Free License	Beginner
DialogBlocks	5.15.3 (Unicode) Built Dec 13 2017	Standalone	Free for unregistered and registered account	Beginner
Zinjal	20180221	Standalone	Free License	Beginner
Anjuta DevStudio	3.18.2	Standalone	Free License	Intermediate
GPS	20170515-63	Standalone	Free License	Intermediate
CLion	2018.1 Build #CL-181.4203.54	Standalone	Free Trial	Advanced
NetBeans IDE	8.2 Build 201609270201	Standalone	Free License	Advanced
CodeLite	12.0.0	Standalone	Free License	Advanced
Eclipse CDT	9.4.3.201802261533	Standalone	Free License	Advanced
KDevelop	5.2.1	Standalone	Free License	Advanced
Qt Creator	4.6.0 Based on Qt 5.10.1	Standalone	Free open source version and trial commercial version	Advanced
Oracle Developer Studio	12.6	Standalone	Free after account registration	Advanced
Sphere Engine	20180319.r445	Cloud	Free Trial	Intermediate
AWS Cloud9	Not specified	Cloud	Free with limited resources	Advanced

Table 1: Analyzed IDEs

There are 51 compilation profiles available in the total of the analyzed tools. Table 2 describes the profiles and respective parameters, being the first profile of each tool precisely which is used as default.

Tool ID	Tool Name	Profile Name	Profile Parameters
1	CMake	Debug	-g
		Release	-O3 -DNDEBUG
		RelwithDebInfo	-O2 -g -DNDEBUG
		MinSizeRel	-Os -DNDEBUG
2	qmake	Debug	-pipe -g -Wall -W -fPIC
		Profile	-pipe -O2 -g -Wall -W -fPIC
		Release	-pipe -O2 -Wall -W -fPIC
3	Qbs	Debug	-g -Oo -Wall -Wextra -pipe -fvisibility=default -fPIC
		Release	-O2 -Wall -Wextra -pipe -fvisibility=default -fPIC -DNDEBUG
4	NetBeans IDE	Debug	-g -MMD -MP -MF
		Release	-O2 -MMD -MP -MF
5	Code::Blocks	Default	(none)
6	CLion	Integrates CMake	
7	CodeLite	Debug	-g -Oo -Wall
		Release	-O2 -Wall -DNDEBUG
8	Eclipse CDT	Debug	-Oo -g3 -Wall -fmessage-length=0
		Release	-O3 -Wall -fmessage-length=0
9	KDevelop	Integrates CMake	
10	Geany	Default	-Wall
11	Anjuta DevStudio	Default	(none)
		Debug	-g -Oo
		Profile	-g -pg
		Optimized	-O2
12	Qt Creator	Integrates CMake, qmake and Qbs	
13	DialogBlocks	Debug	-Oo -ggdb -Wall -Wno-write-strings
		Release	-O2 -Wall -Wno-write-strings
14	Zinjal	Debug	-fshow-column -fno-diagnostics-show-caret -g2 -Wall -Oo
		Release	-fshow-column -fno-diagnostics-show-caret -Wall -O2
15	GPS	Default	(none)
		SomeOpt	-O
		FullOpt	-O2
		FullAutoInli	-O3
16	Oracle Developer Studio	Debug	-g -MMD -MP -MF
		Release	-O2 -MMD -MP -MF
17	Sphere Engine	Default	-O2 -lm -fomit-frame-pointer
18	AWS Cloud9	Debug	-ggdb3 -std=c99
		Default	-std=c99

Table 2: Analyzed tools

A group of 26 compilation profiles was considered for the purpose of measuring the energy consumption and the time of execution of the collected programs, which results are identical for the remaining 25 elements that make up the total set of profiles obtained. Table 3 describes how the profiles are grouped.

Identifier	Tool - Profile Name	Profile Parameters
1	Anjuta DevStudio - Default	(none)
	Code::Blocks - Default	
	GPS - Default	
	AWS Cloud9 - Default	
2	Geany - Default	-Wall
3	Anjuta DevStudio - Debug	-g -Oo
4	Anjuta DevStudio - Profile	-g -pg
5	AWS Cloud9 - Debug	-ggdb3
6	CMake - Debug	-g
	CLion - Debug	
	KDevelop - Debug	
	QT - CmakeDebug	
	NetBeans IDE - Debug	
	Oracle Developer Studio - Debug	
7	Eclipse CDT - Debug	-Oo -g3 -Wall -fmessage-length=0
8	CodeLite - Debug	-g -Oo -Wall
9	Qmake - Debug	-pipe -g -Wall -W -fPIC
	QT - QmakeDebug	
10	Zinjal - Debug	-fshow-column -fno-diagnostics-show-caret -g2 -Wall -Oo
11	Qbs - Debug	-g -Oo -Wall -Wextra -pipe -fvisibility=default -fPIC
	QT - QbsDebug	
12	DialogBlocks - Debug	-Oo -ggdb -Wall -Wno-write-strings
13	GPS - SomeOpt	-O
14	CMake - RelwithDebInfo	-O2 -g -DNDEBUG
	CLion - RelwithDebInfo	
	KDevelop - RelwithDebInfo	
	QT - CmakeRelwithDebInfo	
15	Qmake - Profile	-pipe -O2 -g -Wall -W -fPIC
	QT - QmakeProfile	
16	CodeLite - Release	-O2 -Wall -DNDEBUG
17	DialogBlocks - Release	-O2 -Wall -Wno-write-strings
18	Qmake - Release	-pipe -O2 -Wall -W -fPIC
	QT - QmakeRelease	
19	Anjuta DevStudio - Optimized	-O2
	GPS - FullOpt	
	NetBeans IDE - Release	
	Oracle Developer Studio - Release	
20	Qbs - Release	-O2 -Wall -Wextra -pipe -fvisibility=default -fPIC -DNDEBUG
	QT - QbsRelease	
21	Sphere Engine - Default	-O2 -lm -fomit-frame-pointer
22	Zinjal - Release	-fshow-column -fno-diagnostics-show-caret -Wall -O2
23	CMake - Release	-O3 -DNDEBUG
	CLion - Release	
	KDevelop - Release	
	QT - CmakeRelease	
24	Eclipse CDT - Release	-O3 -Wall -fmessage-length=0
25	GPS - FullAutoInline	-O3
26	CMake - MinSizeRel	-Os -DNDEBUG
	CLion - MinSizeRel	
	KDevelop - MinSizeRel	
	QT - CmakeMinSizeRel	

Table 3: Measured Profiles