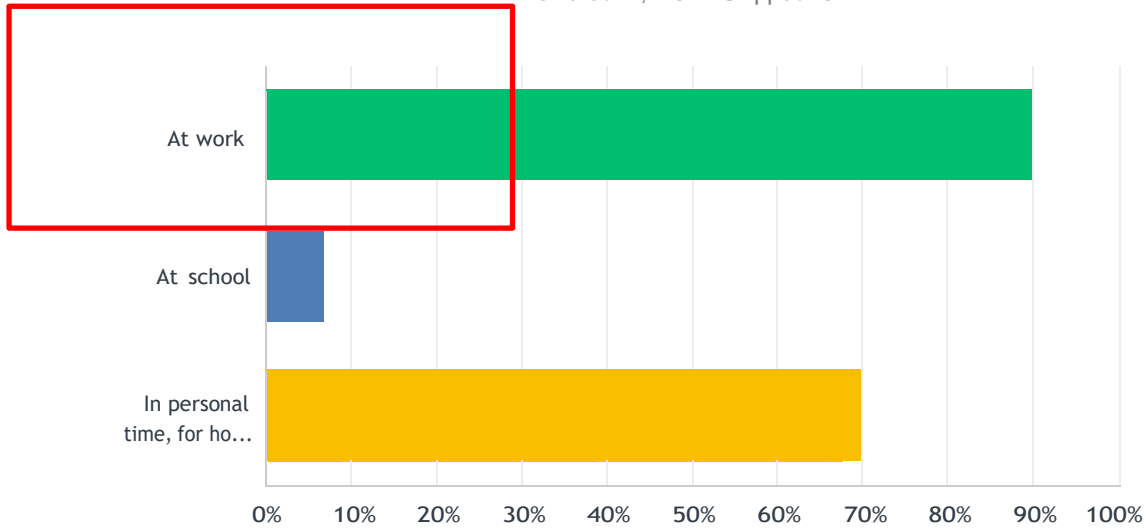


## Q1 C++ 어디에 쓰나요?

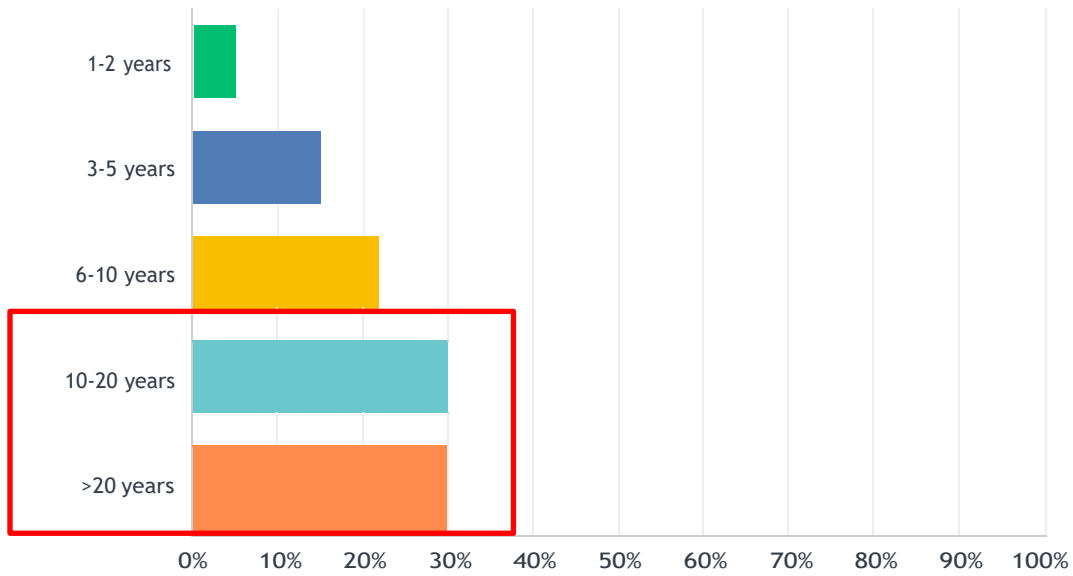
Answered: 1,720 Skipped: 6



ANSWER CHOICES	RESPONSES	
At work	89.24%	1,535
At school	6.80%	117
In personal time, for hobby projects or to try new things	67.62%	1,163
Total Respondents: 1,720		

## Q2 C++ 개발 경력은요?

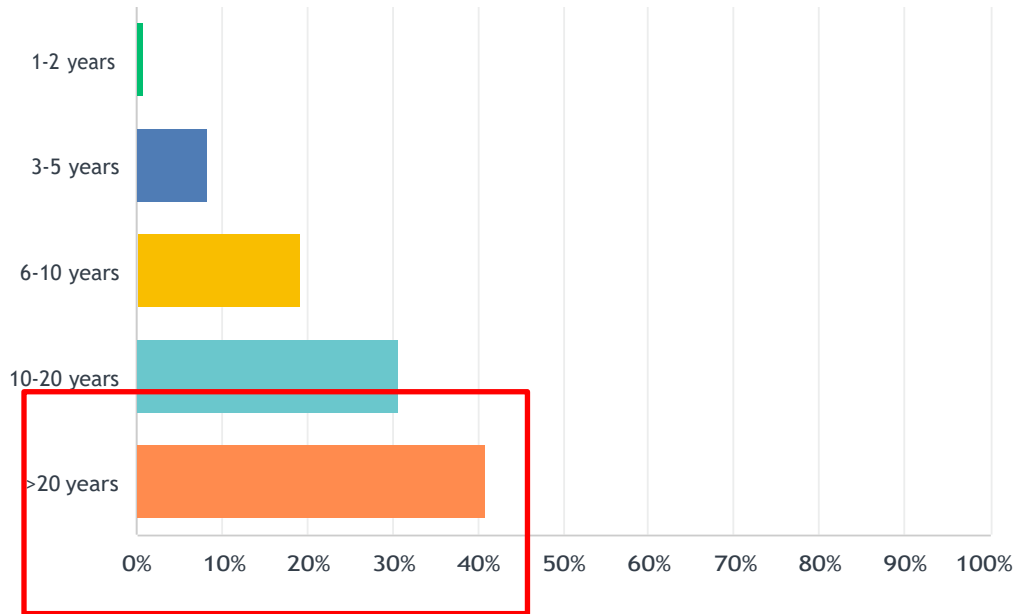
Answered: 1,722 Skipped: 4



ANSWER CHOICES	RESPONSES	
1-2 years	5.11%	88
3-5 years	15.16%	261
6-10 years	22.01%	379
10-20 years	30.43%	524
>20 years	27.29%	470
TOTAL		1,722

## Q3 모든 언어 통틀어 개발 경력은요?

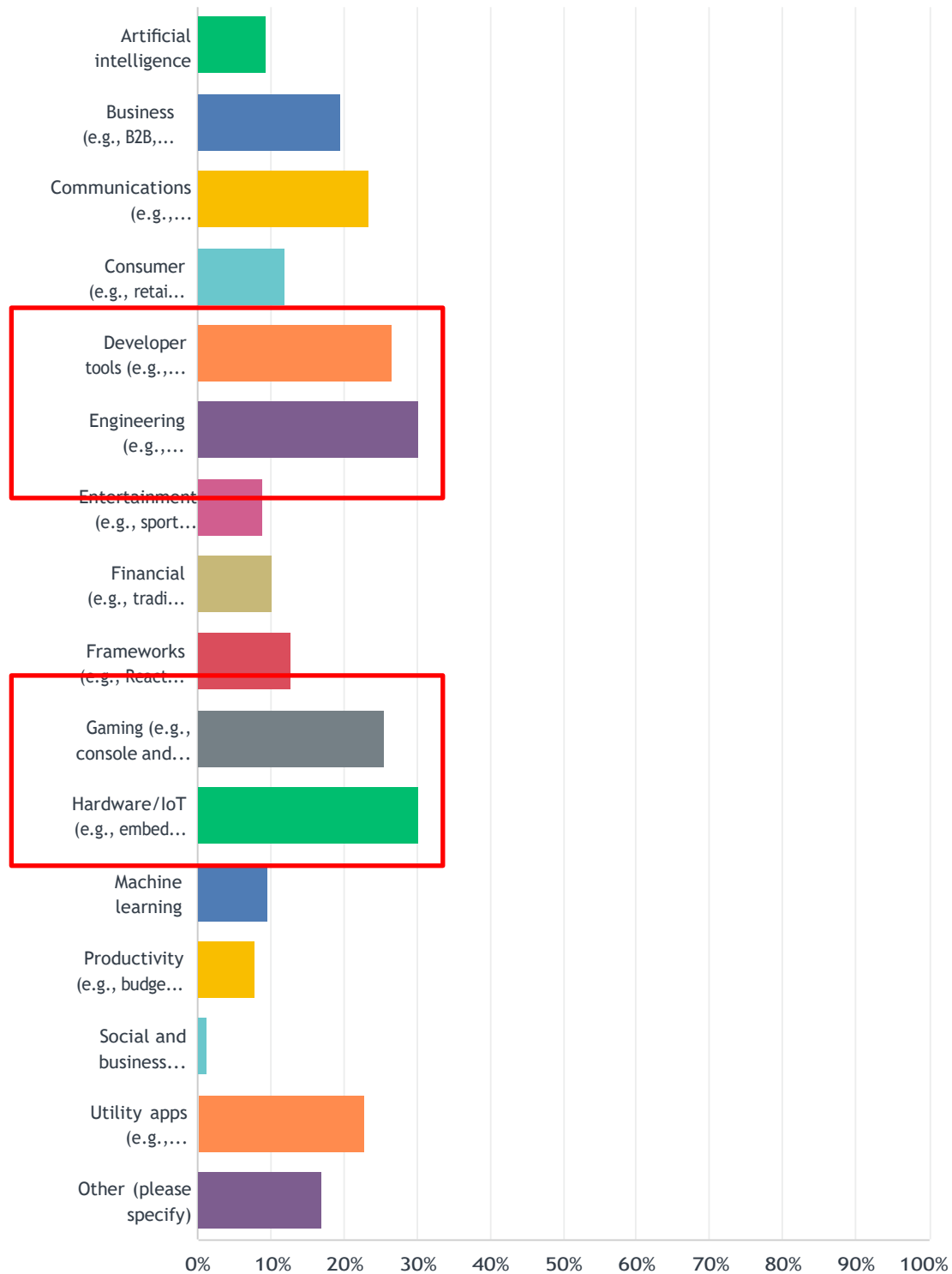
Answered: 1,716 Skipped: 10



ANSWER CHOICES	RESPONSES	
1-2 years	0.87%	15
3-5 years	8.22%	141
6-10 years	19.23%	330
10-20 years	30.77%	528
>20 years	40.91%	702
TOTAL		1,716

## Q4 어떤 타입의 업무를 하세요?

Answered: 1,715 Skipped: 11

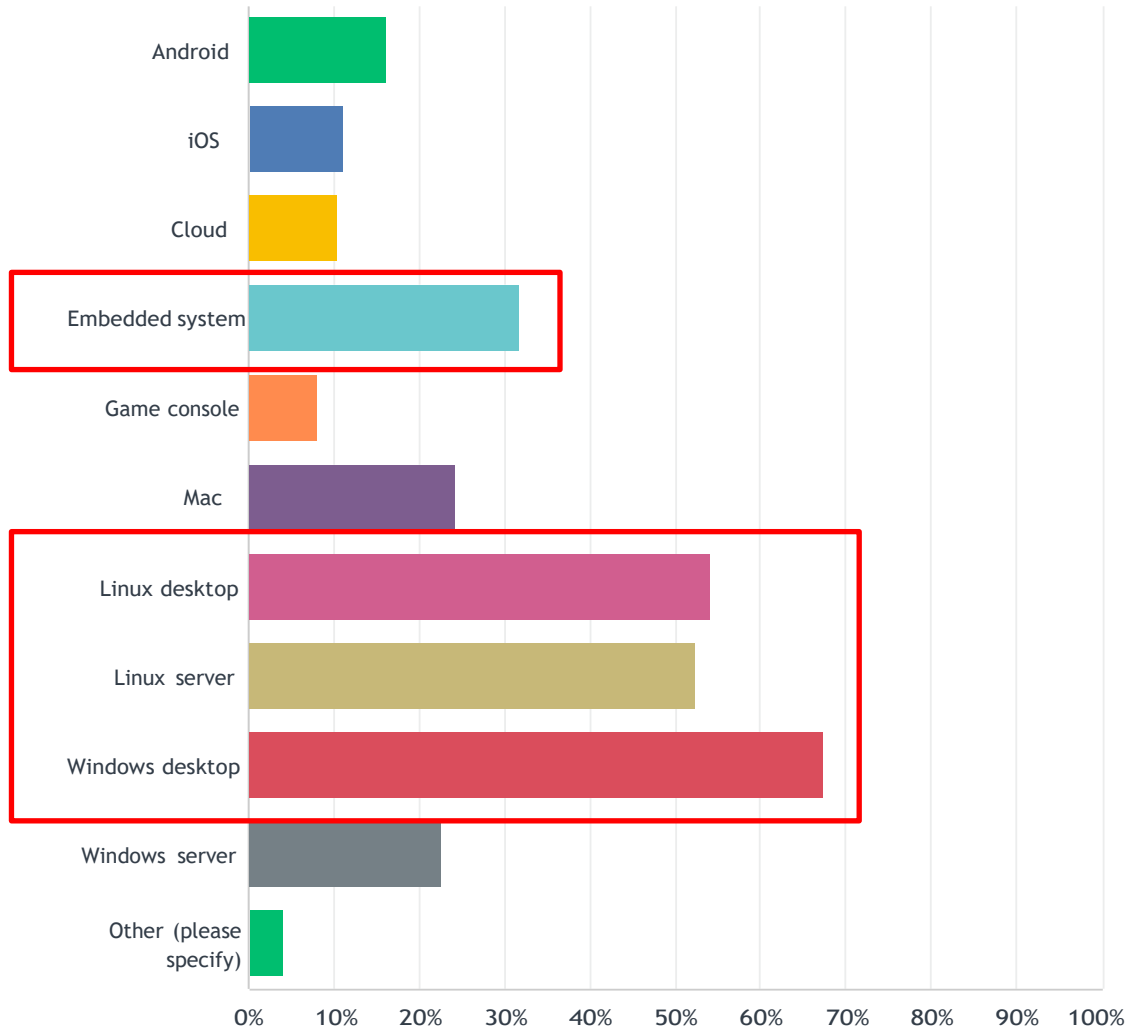


## 2023 Annual C++ Developer Survey "Lite"

ANSWER CHOICES	RESPONSES	
Artificial intelligence	9.33%	160
Business (e.g., B2B, B2E)	19.53%	335
Communications (e.g., networking, email)	23.56%	404
Consumer (e.g., retail websites, mobile apps)	11.84%	203
Developer tools (e.g., compilers, code editors)	26.65%	457
Engineering (e.g., avionics, power management)	30.38%	521
Entertainment (e.g., sports apps, video streaming)	9.04%	155
Financial (e.g., trading, mortgage, asset management)	10.26%	176
Frameworks (e.g., React, Unity)	12.83%	220
Gaming (e.g., console and mobile games)	25.60%	439
Hardware/IoT (e.g., embedded systems, home automation)	30.26%	519
Machine learning	9.68%	166
Productivity (e.g., budget tracking, note taking)	7.93%	136
Social and business networking (e.g., Facebook, Twitter)	1.22%	21
Utility apps (e.g., calculators, simple image editors)	22.74%	390
Other (please specify)	16.97%	291
Total Respondents: 1,715		

## Q5 어떤 플랫폼용으로 개발하세요?

Answered: 1,720 Skipped: 6

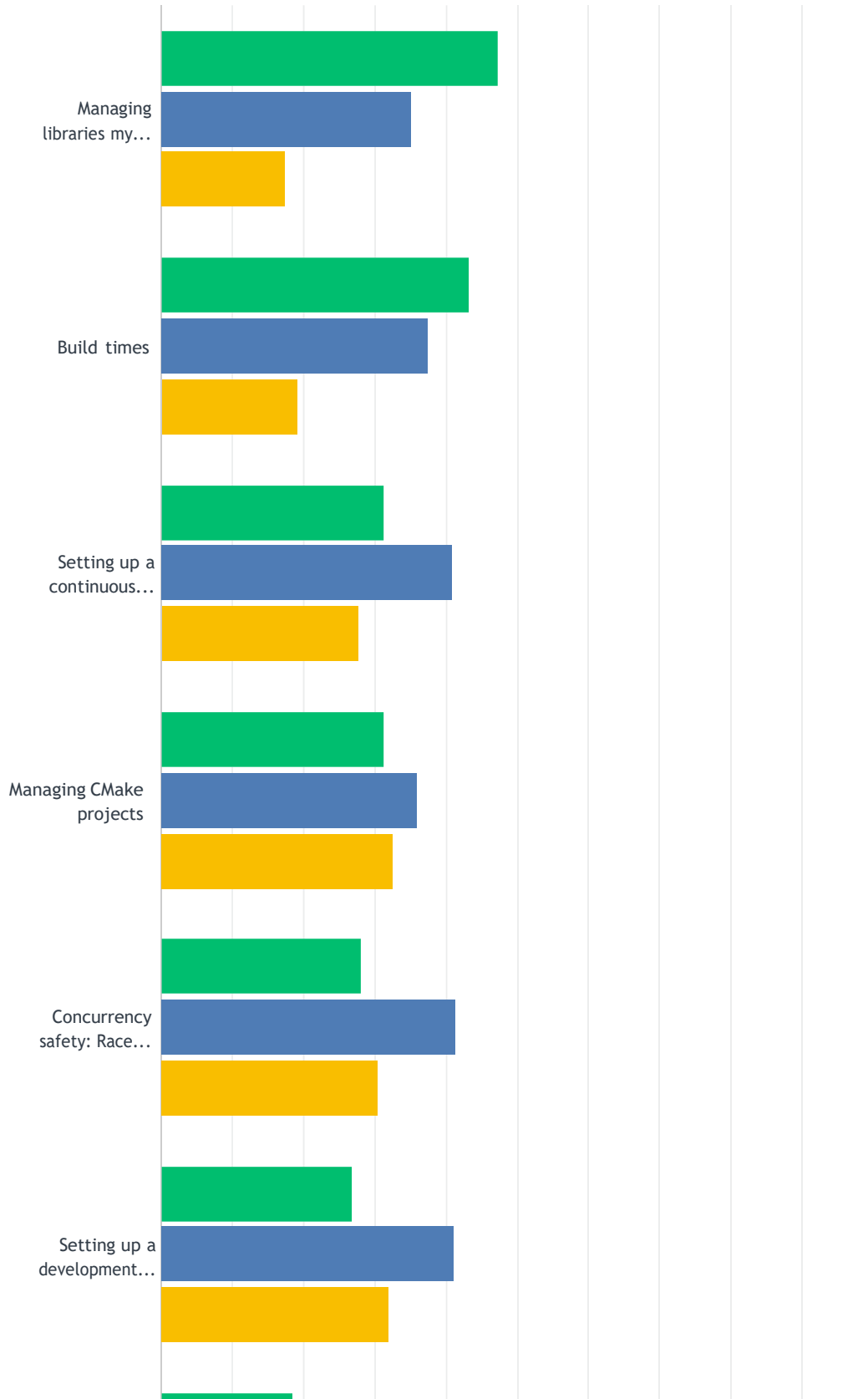


## 2023 Annual C++ Developer Survey "Lite"

ANSWER CHOICES	RESPONSES	
Android	16.10%	277
iOS	11.16%	192
Cloud	10.47%	180
Embedded system	31.74%	546
Game console	8.20%	141
Mac	24.36%	419
Linux desktop	54.19%	932
Linux server	52.44%	902
Windows desktop	67.38%	1,159
Windows server	22.50%	387
Other (please specify)	4.01%	69
Total Respondents: 1,720		

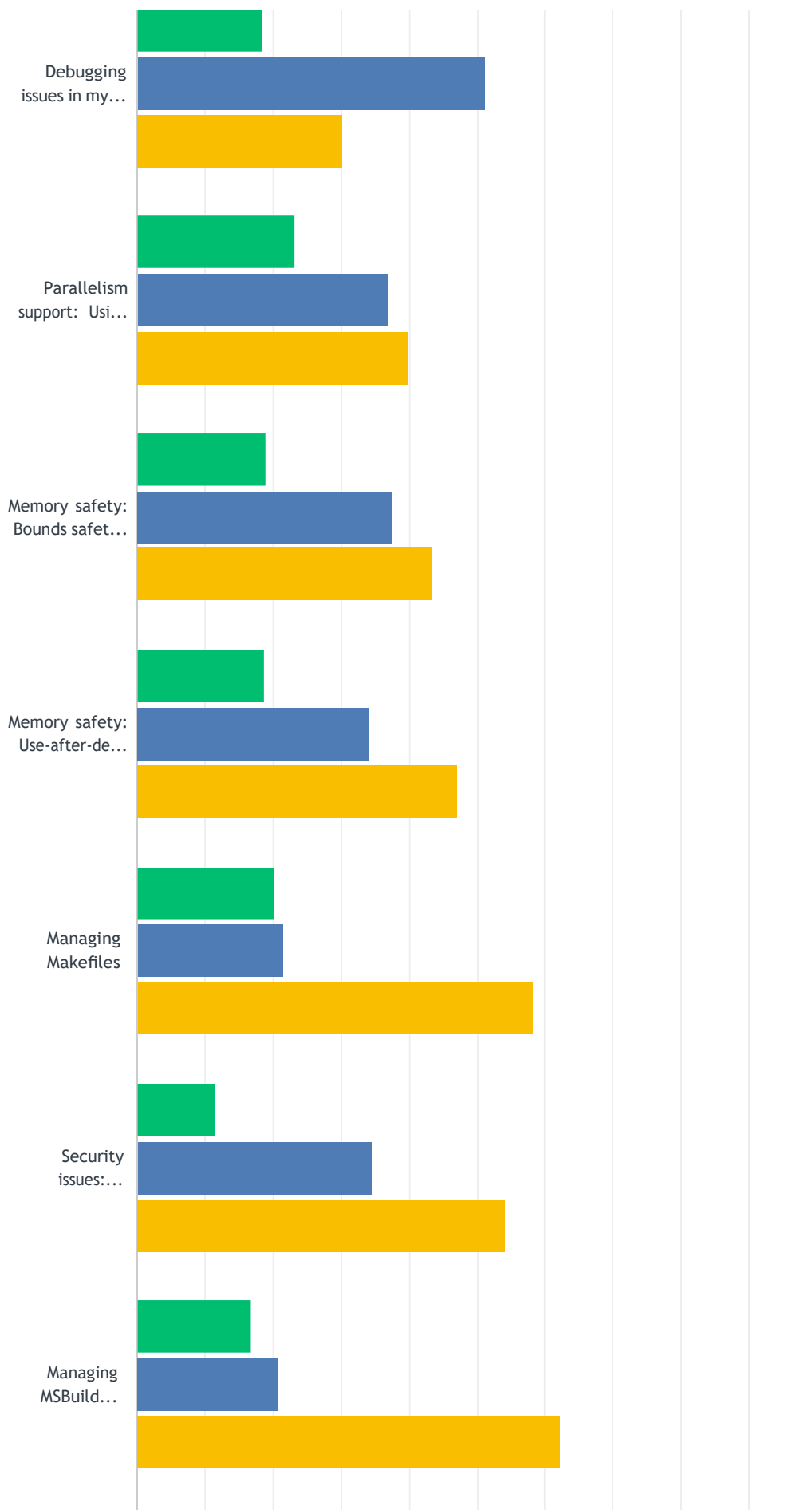
## Q6 C++ 에서 실망스러운 부분을 선택해주세요.

Answered: 1,721 Skipped: 5

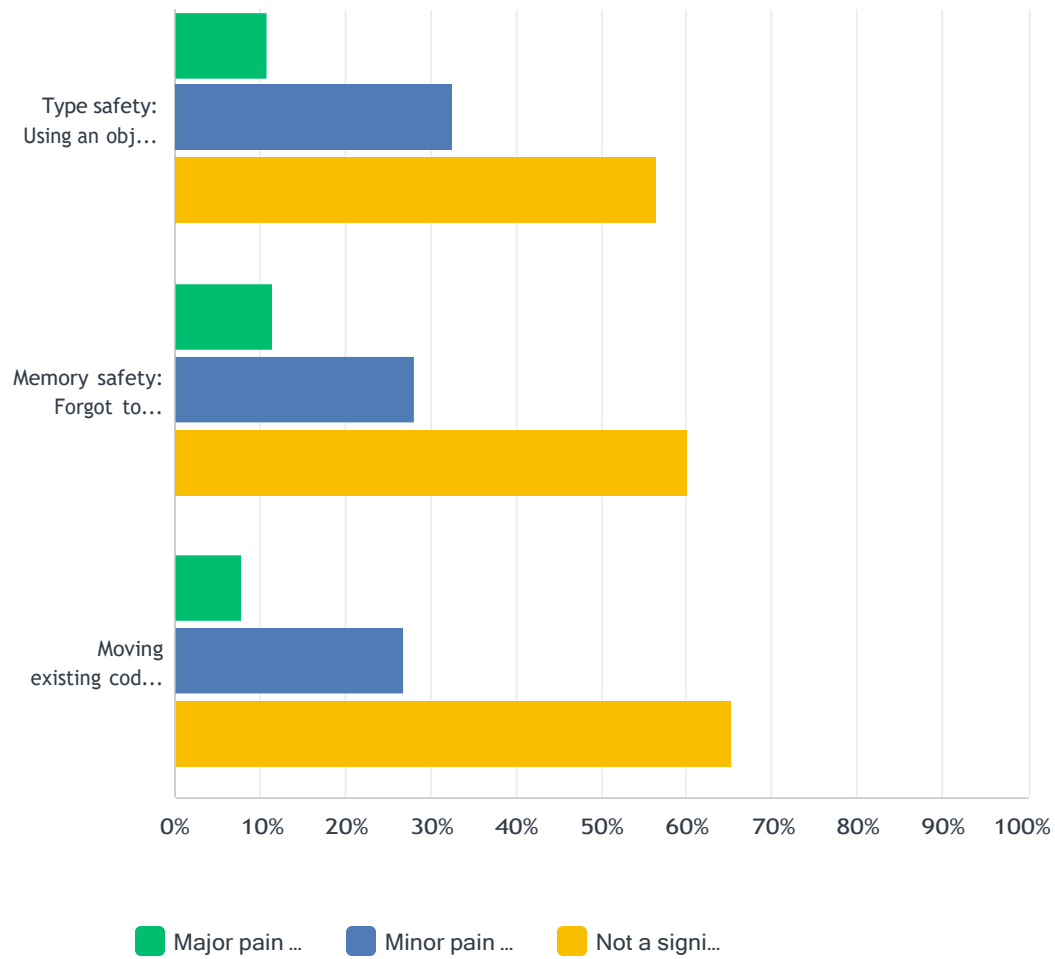




## 2023 Annual C++ Developer Survey "Lite"



## 2023 Annual C++ Developer Survey "Lite"



## 2023 Annual C++ Developer Survey "Lite"

	MAJOR PAIN POINT	MINOR PAIN POINT	NOT A SIGNIFICANT ISSUE FOR ME	TOTAL	WEIGHTED AVERAGE
내 Application 이 의존하는 Library 관리	47.37% 810	35.09% 600	17.54% 300	1,710	2.30
Build times	43.34% 735	37.56% 637	19.10% 324	1,696	2.24
자동화된 빌드, 테스트 등 CI 환경 세팅 (automated builds, tests, ...)	31.35% 531	40.85% 692	27.80% 471	1,694	2.04
CMake 프로젝트 관리	31.24% 527	36.10% 609	32.66% 551	1,687	1.99
동시성 안전성: Races, deadlocks, performance bottlenecks	28.17% 480	41.37% 705	30.46% 519	1,704	1.98
개발환경 세팅 (컴파일러, 빌드시스템, IDE 등) (compiler, build system, IDE, ...)	26.83% 459	41.09% 703	32.09% 549	1,711	1.95
디버깅 이슈	18.52% 313	51.24% 866	30.24% 511	1,690	1.88
병렬 프로그래밍 지원: Using more CPU/GPU/other cores to compute an answer faster	23.24% 393	36.84% 623	39.92% 675	1,691	1.83
Memory safety: Bounds safety issues (read/write beyond the bounds of an object or array)	18.92% 323	37.55% 641	43.53% 743	1,707	1.75
Memory safety: Use-after-delete/free (dangling pointers, iterators, spans, ...)	18.83% 321	34.13% 582	47.04% 802	1,705	1.72
Managing Makefiles	20.21% 333	21.48% 354	58.31% 961	1,648	1.62
Security issues: Overlaps with "safety" but includes other issues (secret disclosure, vulnerabilities, exploits, ...)	11.42% 193	34.44% 582	54.14% 915	1,690	1.57
Managing MSBuild projects	16.77% 274	20.99% 343	62.24% 1,017	1,634	1.55
Type safety: Using an object as the wrong type (unsafe downcasts, unsafe unions, ...)	10.90% 186	32.69% 558	56.41% 963	1,707	1.54
Memory safety: Forgot to delete/free (memory leaks)	11.60% 198	28.24% 482	60.16% 1,027	1,707	1.51
Moving existing code to the latest language standard	7.92% 135	26.88% 458	65.20% 1,111	1,704	1.43

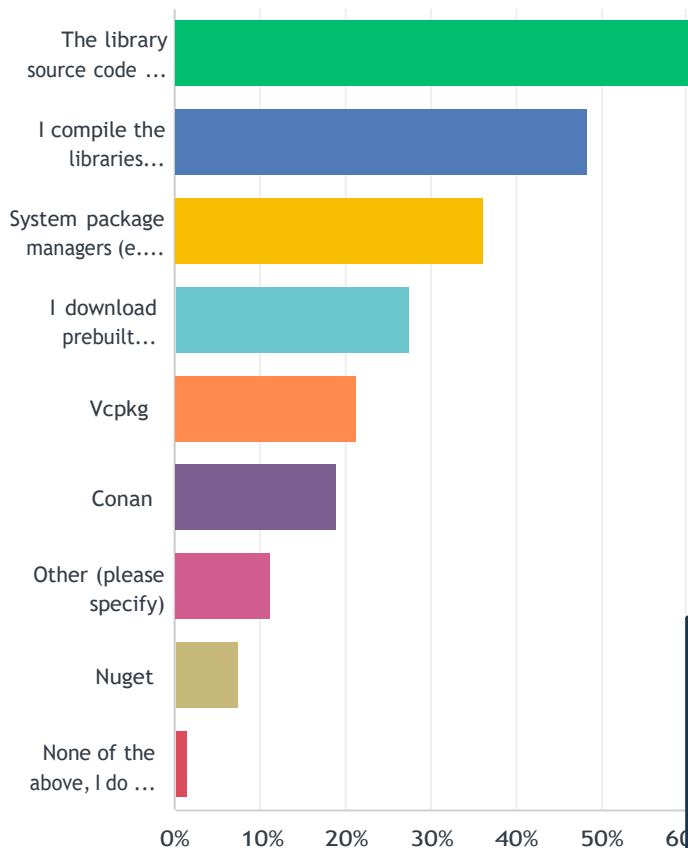
Q7 지난 한 해 동안, 가장 흥미로웠거나 C++ 미래에 긍정적이었던 것은 무엇이라고 생각하나요?

Answered: 978 Skipped: 748



## Q8 라이브러리 관리 어떻게 하세요? (중복체크 가능)

Answered: 1,706 Skipped: 20



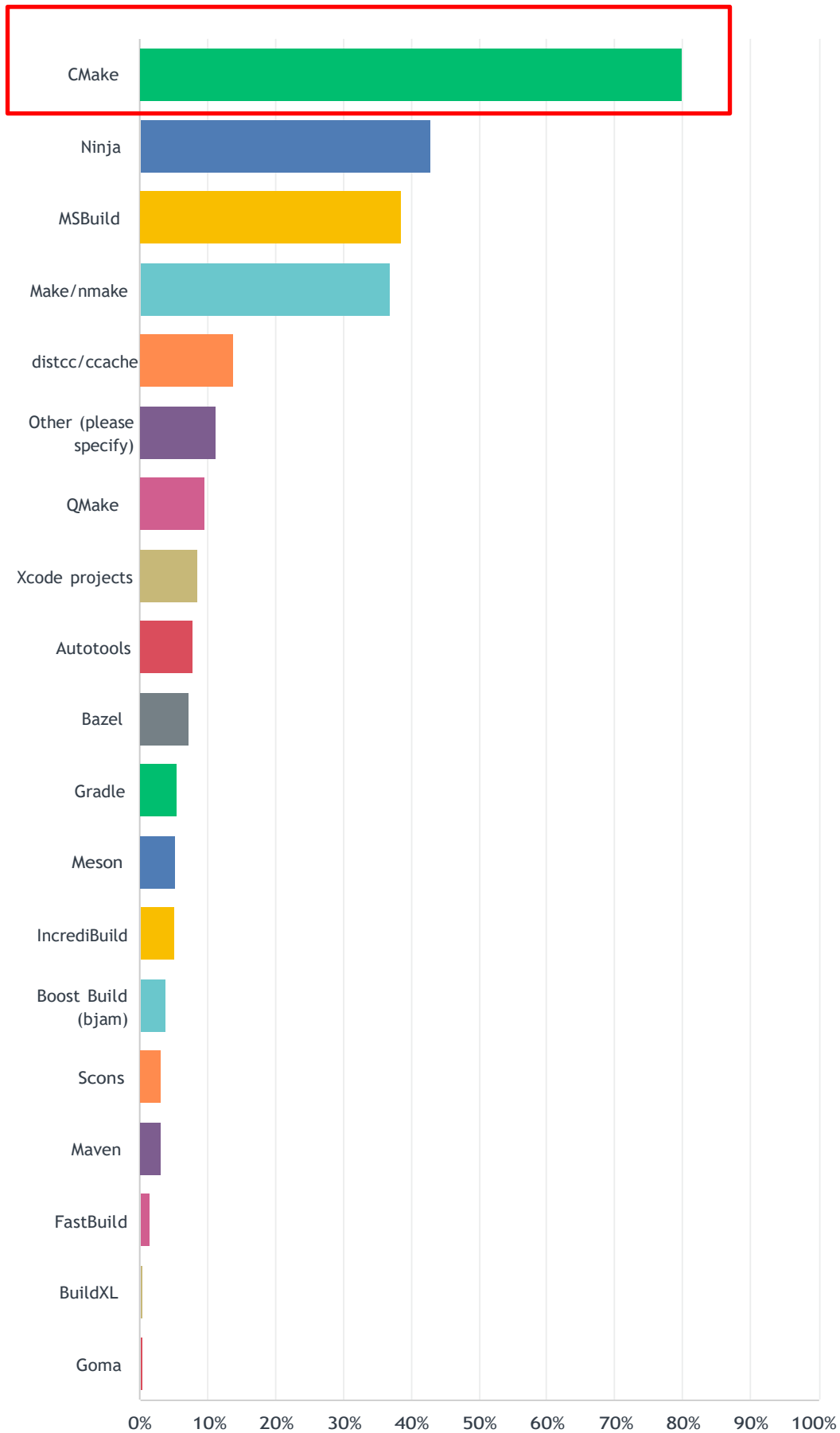
2022년 설문대비  
Vcpkg 18.93% -> 21.34로 증가  
나머지 모두 감소.

ANSWER CHOICES	RESPONSES	
내 빌드의 일부로 넣습니다.	68.11%	1,162
라이브러리를 그들의 명령어를 이용하여, 따로 컴파일합니다.	48.30%	824
시스템 패키지 도구를 씁니다. (apt, brew 등)	36.23%	618
이미 빌드된 라이브러리를 인터넷에서 다운받아요.	27.43%	468
Vcpkg	21.34%	364
Conan	18.93%	323
Other (please specify)	11.25%	192
Nuget	7.50%	128
None of the above, I do not have any dependencies	1.41%	24
Total Respondents: 1,706		

## Q9 빌드도구 어떤 것 쓰세요? (중복 체크 가능)

Answered: 1,705   Skipped: 21

## 2023 Annual C++ Developer Survey "Lite"



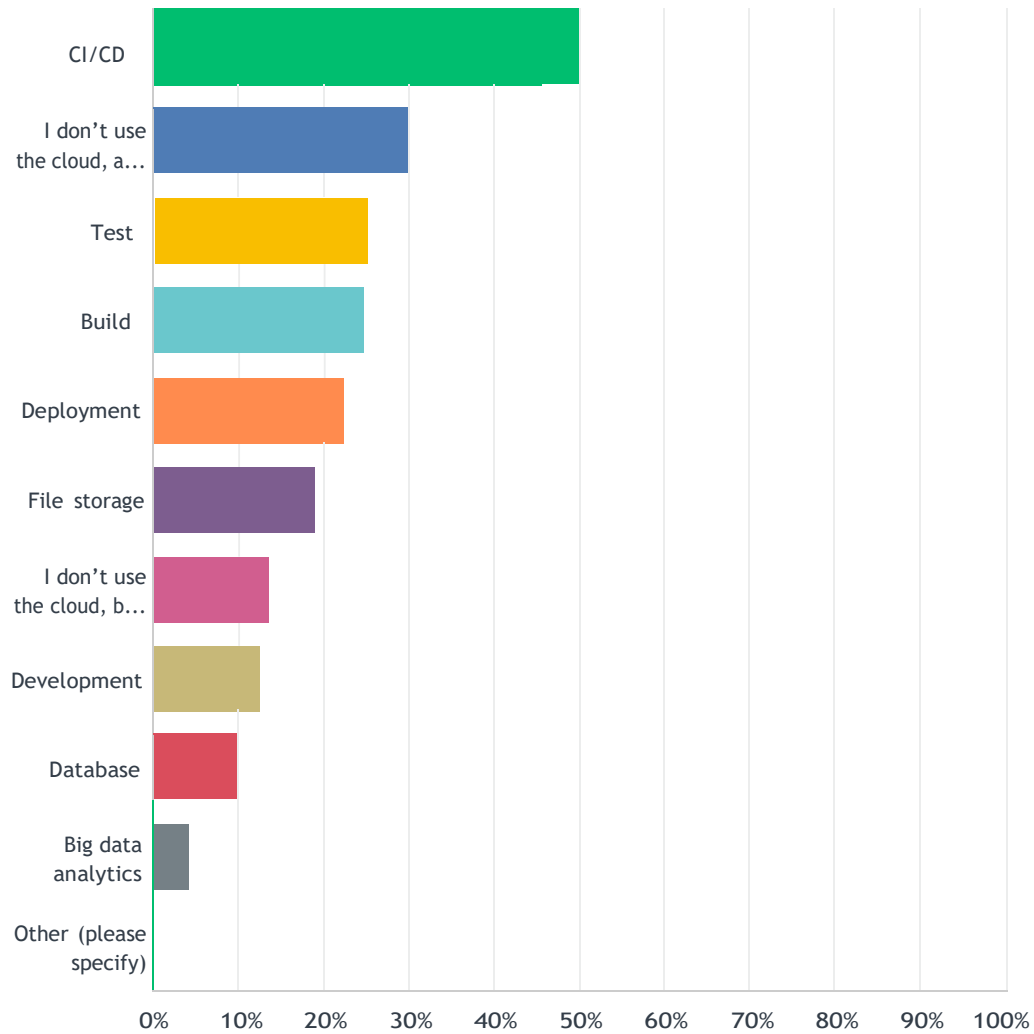
# 2023 Annual C++ Developer Survey "Lite"

ANSWER CHOICES	RESPONSES	
CMake	79.88%	1,362
Ninja	42.93%	732
MSBuild	38.53%	657
Make/nmake	36.89%	629
distcc/ccache	13.96%	238
Other (please specify)	11.38%	194
QMake	9.62%	164
Xcode projects	8.62%	147
Autotools	7.92%	135
Bazel	7.27%	124
Gradle	5.45%	93
Meson	5.28%	90
IncrediBuild	5.10%	87
Boost Build (bjam)	3.81%	65
Scons	3.23%	55
Maven	3.17%	54
FastBuild	1.58%	27
BuildXL	0.47%	8
Goma	0.35%	6
Total Respondents: 1,705		



## Q10 개발주기의 어떤 부분에서 클라우드를 사용합니까? (중복 체크 가능)

Answered: 1,681 Skipped: 45

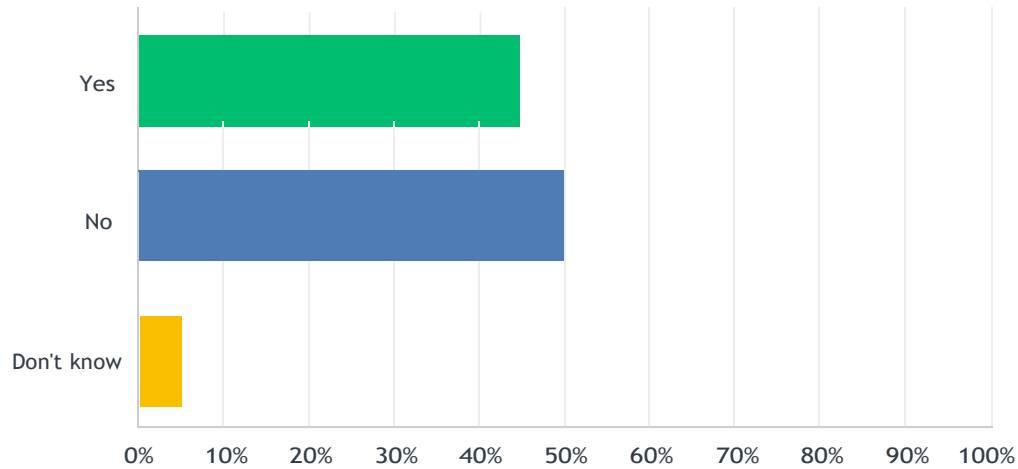


## 2023 Annual C++ Developer Survey "Lite"

ANSWER CHOICES	RESPONSES	
CI/CD	45.69%	768
I don't use the cloud, and I am not interested	29.57%	497
Test	25.10%	422
Build	24.69%	415
Deployment	22.37%	376
File storage	18.92%	318
I don't use the cloud, but I am interested	13.74%	231
Development	12.67%	213
Database	9.28%	156
Big data analytics	4.28%	72
Other (please specify)	2.02%	34
Total Respondents: 1,681		

## Q11 Does your current project use sanitizers and/or fuzzing as part of its normal development and release cycle?

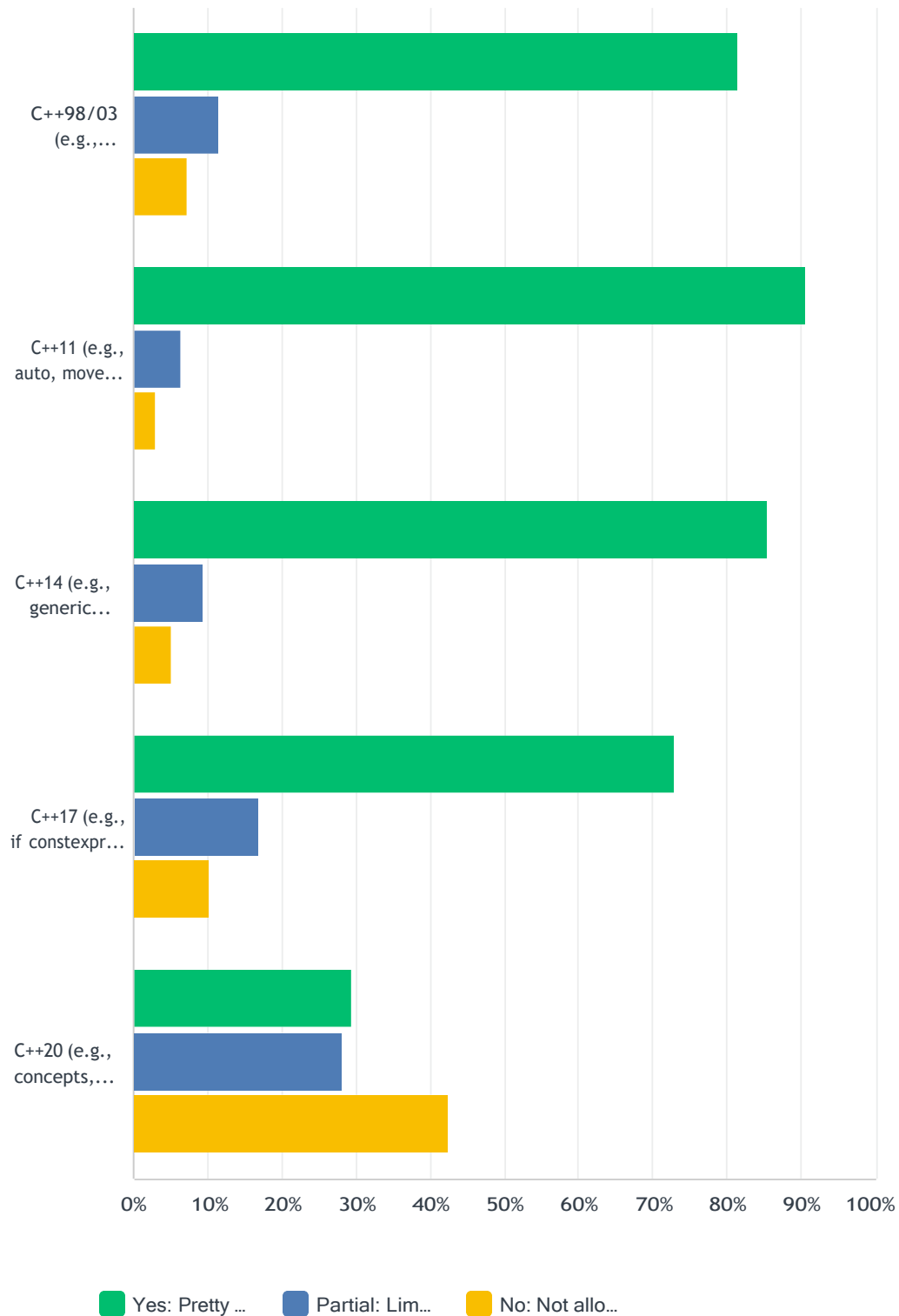
Answered: 1,708 Skipped: 18



ANSWER CHOICES		RESPONSES	
Yes		44.85%	766
No		50.06%	855
Don't know		5.09%	87
TOTAL			1,708

## Q12 현재 사용중인 C++ 버전은? (학교 or 직장)

Answered: 1,707 Skipped: 19

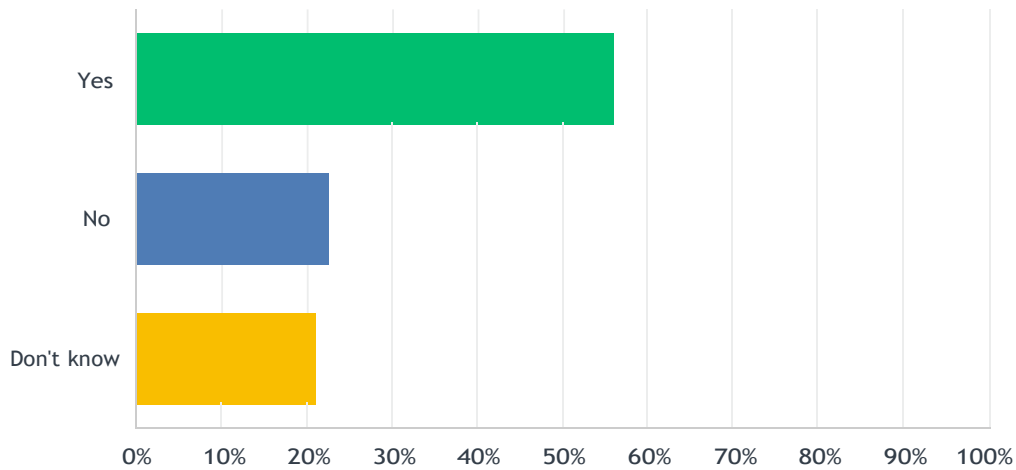


# 2023 Annual C++ Developer Survey "Lite"

	YES: PRETTY MUCH ALL	PARTIAL: LIMITED FEATURES/USAGE	NO: NOT ALLOWED	TOTAL	WEIGHTED AVERAGE
C++98/03 (e.g., exceptions, templates, RTTI)	81.35% 1,278	11.46% 180	7.19% 113	1,571	2.74
C++11 (e.g., auto, move semantics, =delete/=default, shared_ptr, lambdas)	90.69% 1,452	6.31% 101	3.00% 48	1,601	2.88
C++14 (e.g., generic lambdas, auto return types, general constexpr functions)	85.42% 1,377	9.43% 152	5.15% 83	1,612	2.80
C++17 (e.g., if constexpr, if/switch scoped variables, structured bindings, string_view, optional/any/variant, Parallel STL)	72.91% 1,203	16.79% 277	10.30% 170	1,650	2.63
C++20 (e.g., concepts, coroutines, modules)	29.33% 483	28.17% 464	42.50% 700	1,647	1.87

## Q13 현재 프로젝트에 12개월 내로 이전보다 더 많은 현대식 C++ 표준 문법을 사용할 것인가요?

Answered: 1,700 Skipped: 26

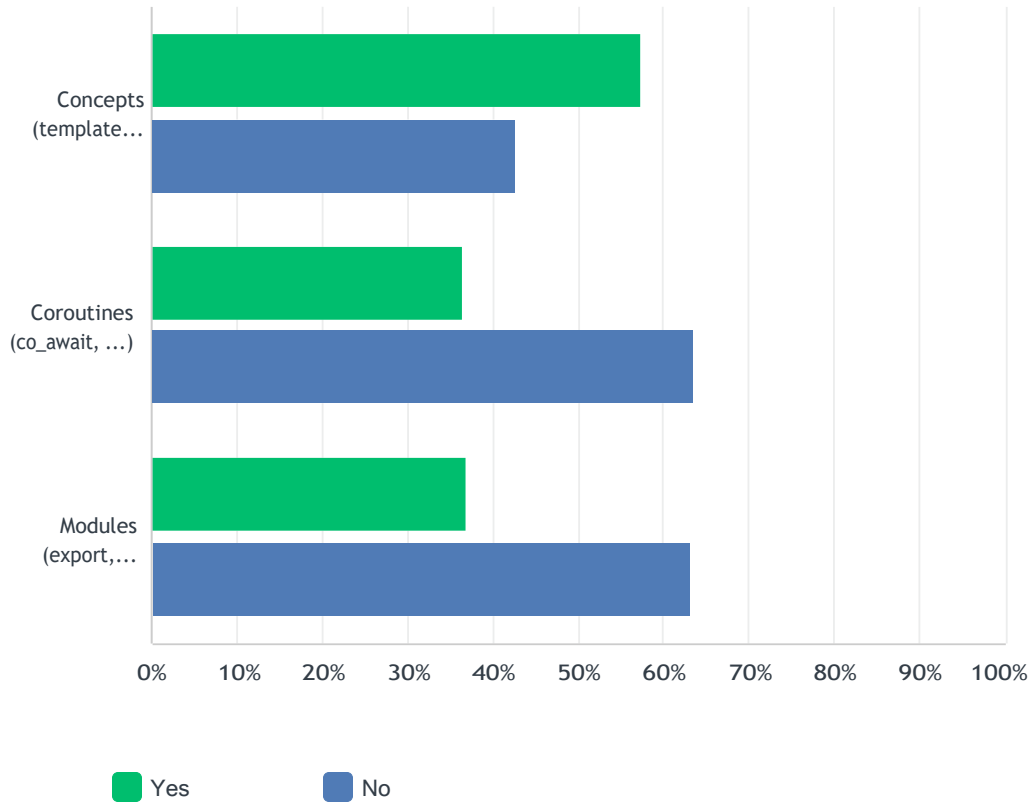


ANSWER CHOICES	RESPONSES	
Yes	56.18%	955
No	22.65%	385
Don't know	21.18%	360
TOTAL		1,700

## Q14 다음은 C++ 20/23 기능들 입니다.

향후 12개월 내로 프로젝트에 사용할 것입니까 Answered: 1,650

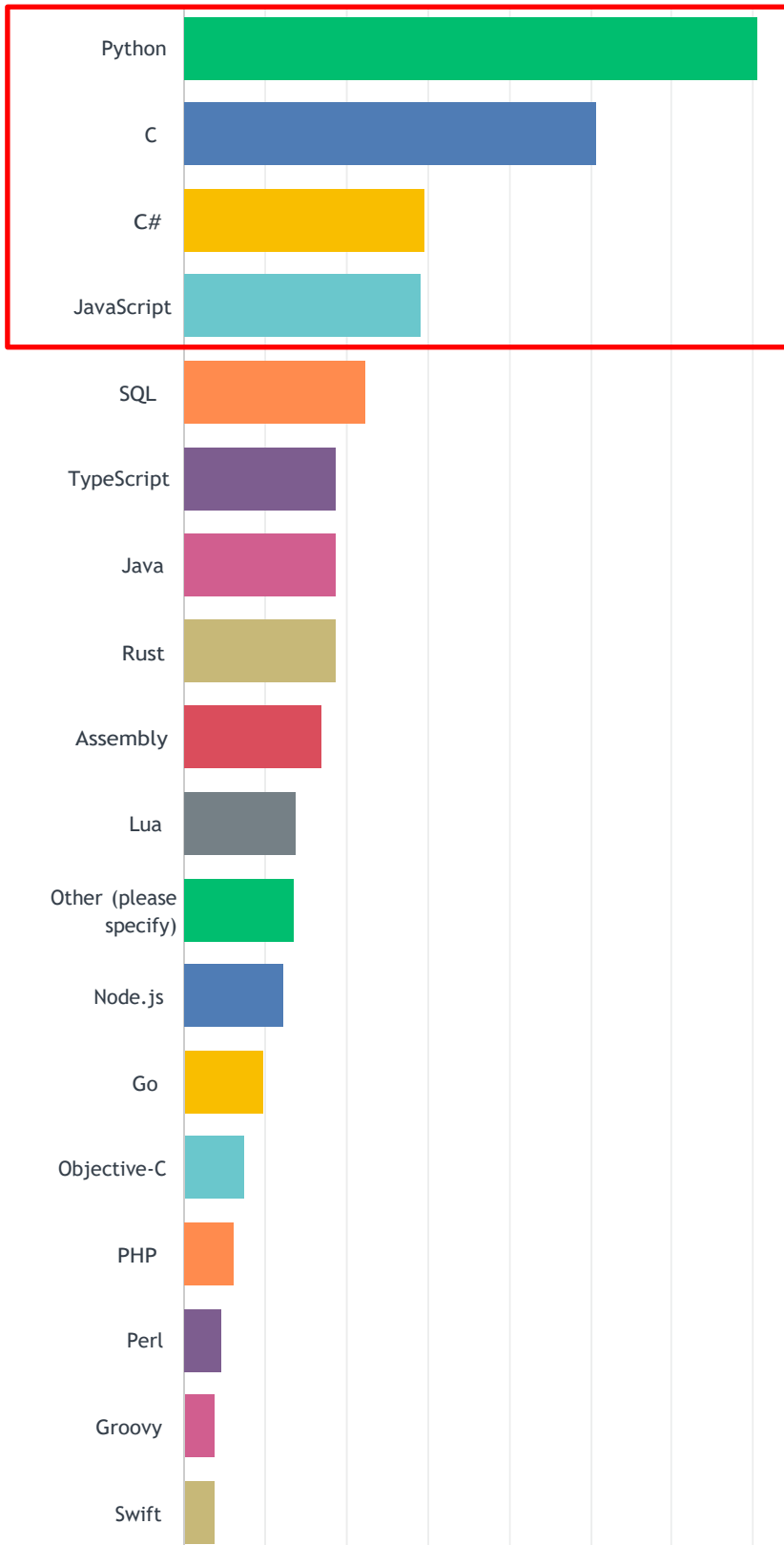
Skipped: 76



	YES	NO	TOTAL	WEIGHTED AVERAGE
Concepts (template constraints, requires, ...)	57.39% 940	42.61% 698	1,638	1.85
Coroutines (co_await, ...)	36.42% 594	63.58% 1,037	1,631	2.27
Modules (export, import, ...)	36.87% 601	63.13% 1,029	1,630	2.26

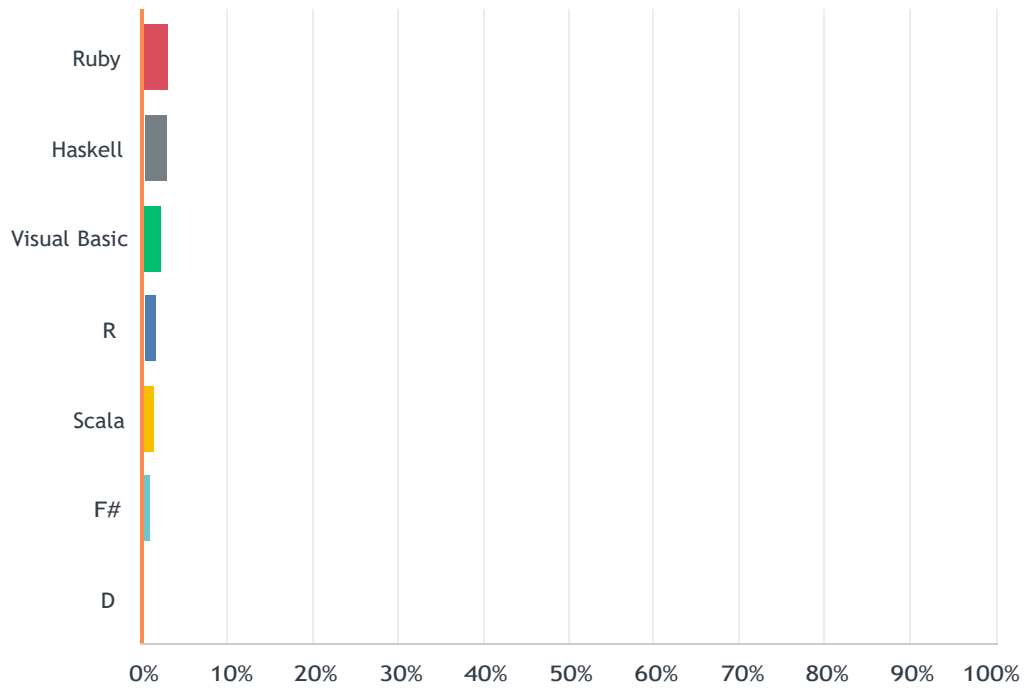
## Q15 C++을 제외하고, 최근 프로젝트에서 사용중인 언어는요? (중복체크 가능)

Answered: 1,676 Skipped: 50





## 2023 Annual C++ Developer Survey "Lite"

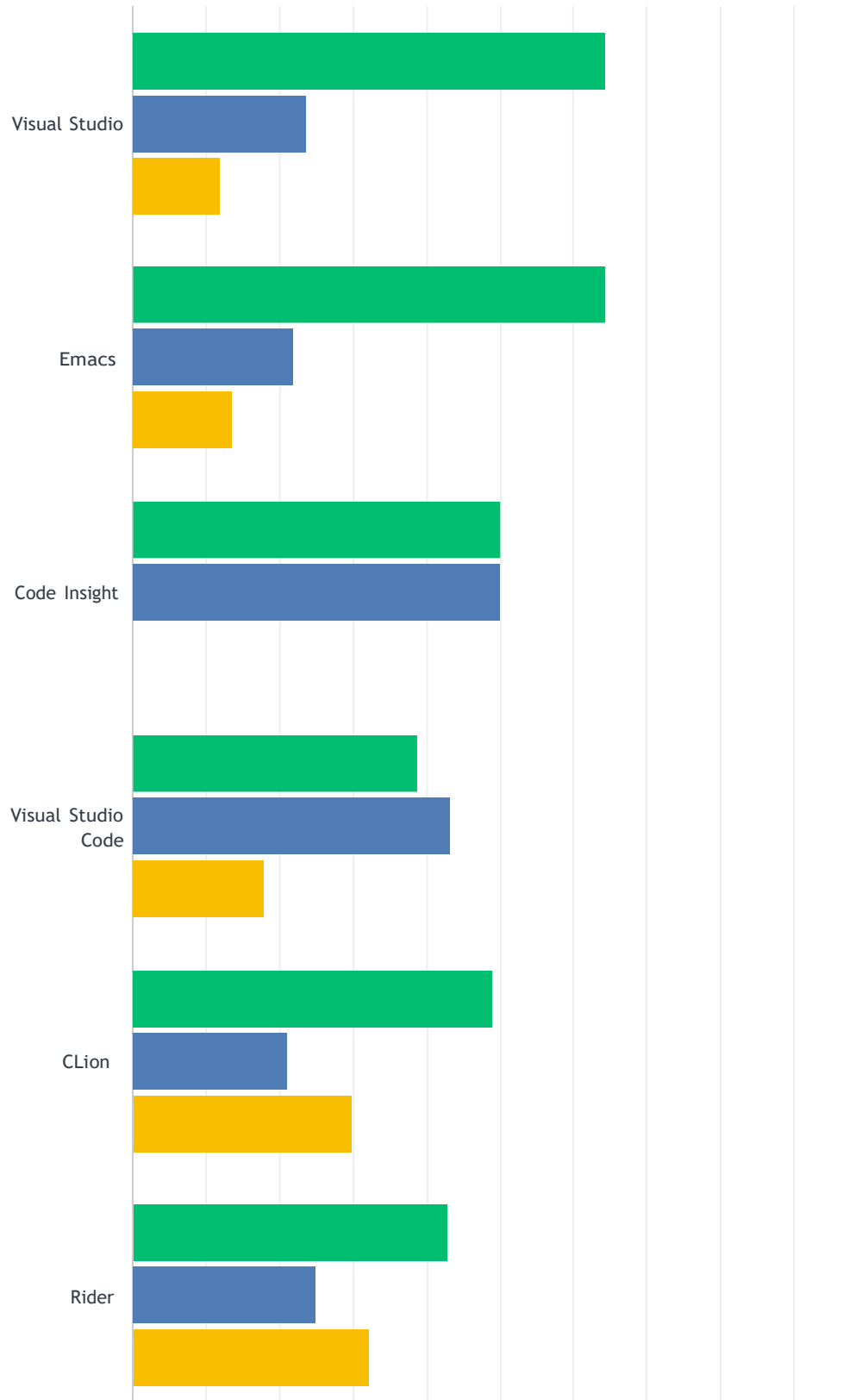


# 2023 Annual C++ Developer Survey "Lite"

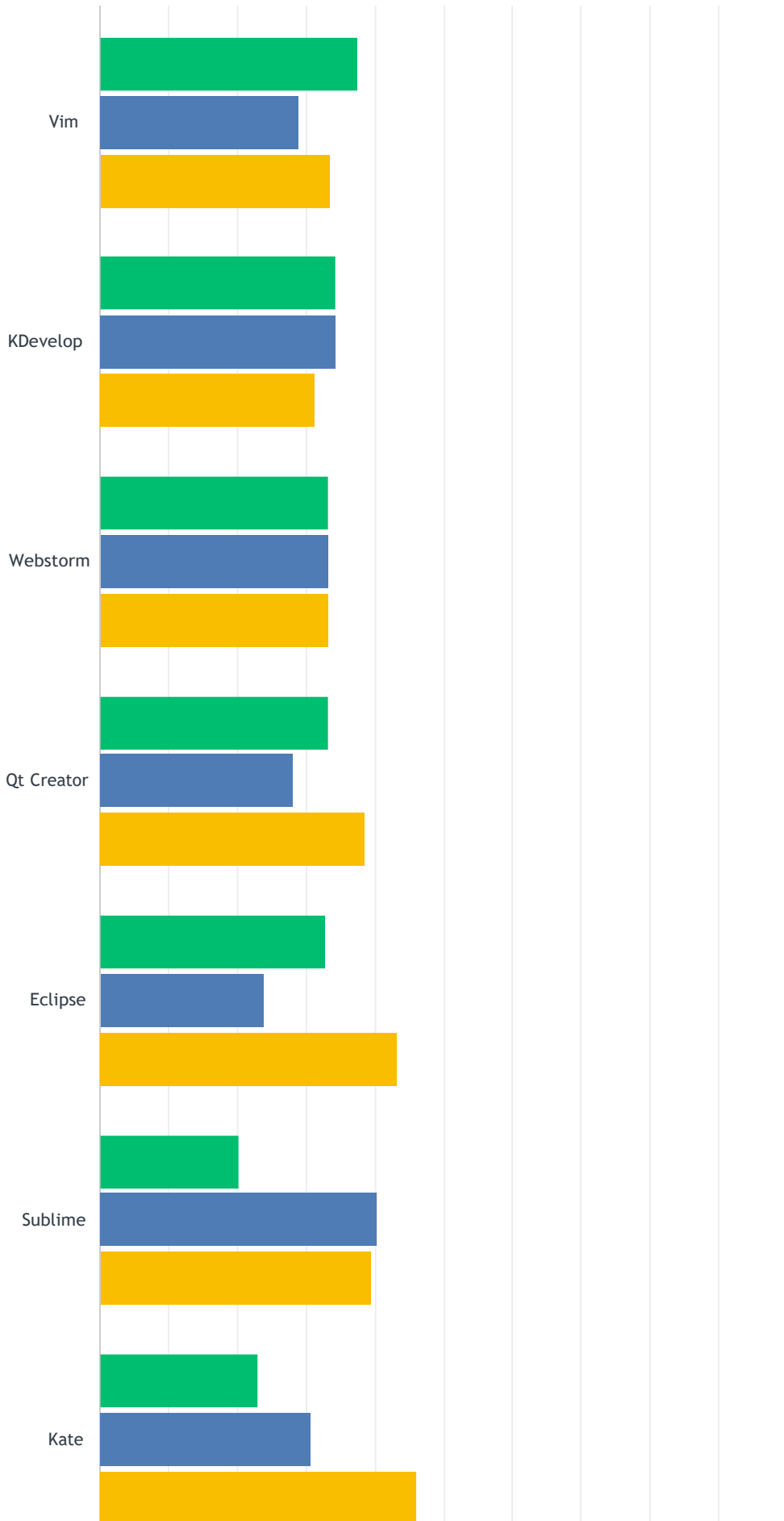
ANSWER CHOICES	RESPONSES	
Python	70.53%	1,182
C	50.78%	851
C#	29.59%	496
JavaScript	29.30%	491
SQL	22.43%	376
TypeScript	18.85%	316
Java	18.74%	314
Rust	18.68%	313
Assembly	17.06%	286
Lua	13.78%	231
Other (please specify)	13.60%	228
Node.js	12.41%	208
Go	9.73%	163
Objective-C	7.46%	125
PHP	6.21%	104
Perl	4.71%	79
Groovy	3.88%	65
Swift	3.88%	65
Ruby	2.98%	50
Haskell	2.86%	48
Visual Basic	2.03%	34
R	1.43%	24
Scala	1.25%	21
F#	0.84%	14
D	0.36%	6
Total Respondents: 1,676		

## Q16 C++ 개발할 때 어떤 IDE를 쓰세요?

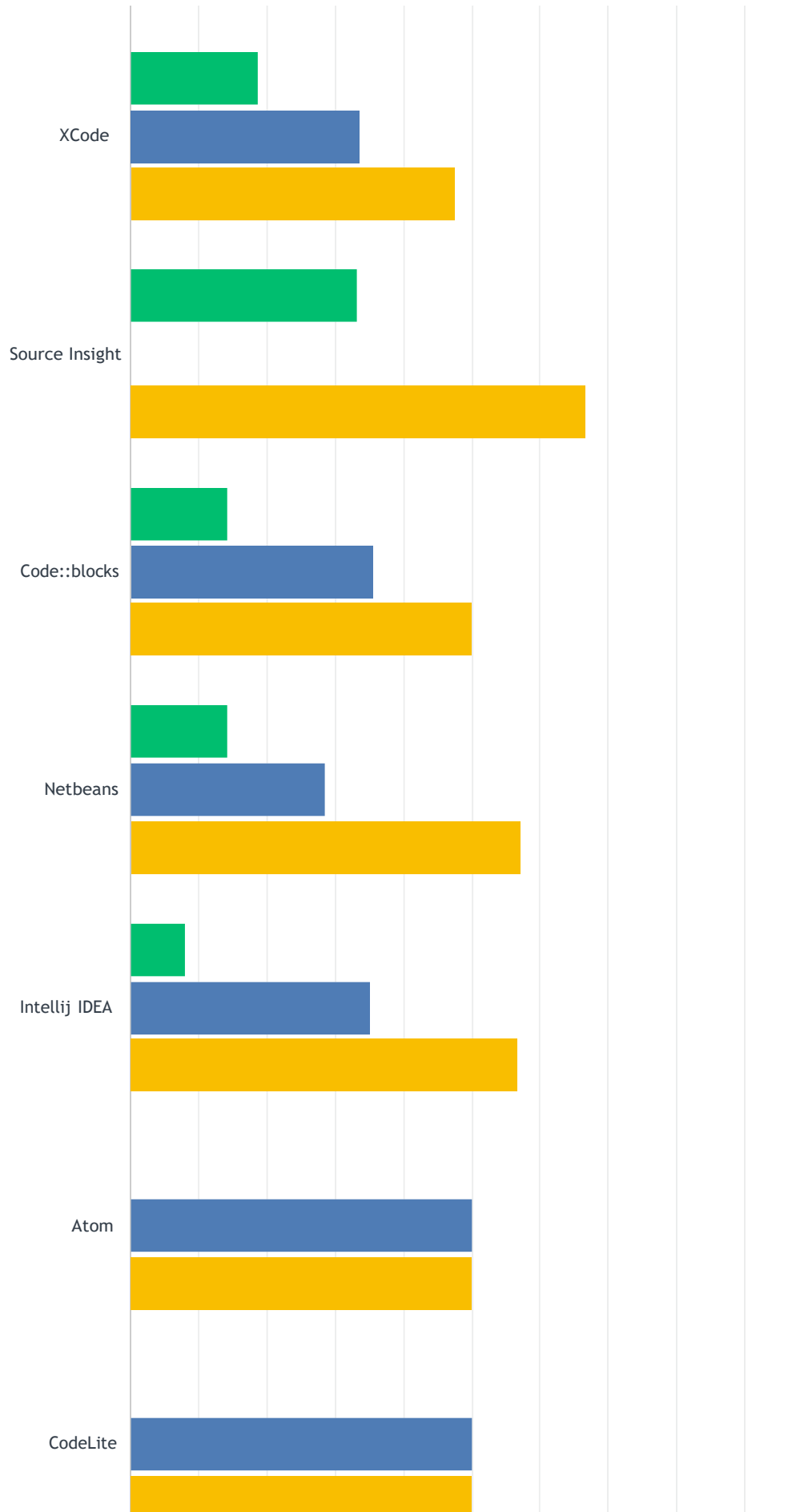
Answered: 1,708 Skipped: 18



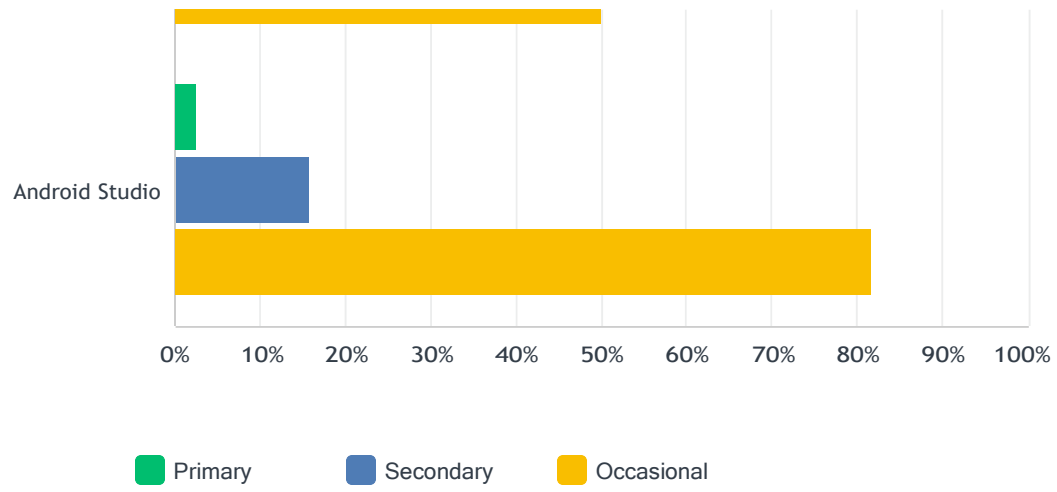
## 2023 Annual C++ Developer Survey "Lite"



## 2023 Annual C++ Developer Survey "Lite"



## 2023 Annual C++ Developer Survey "Lite"

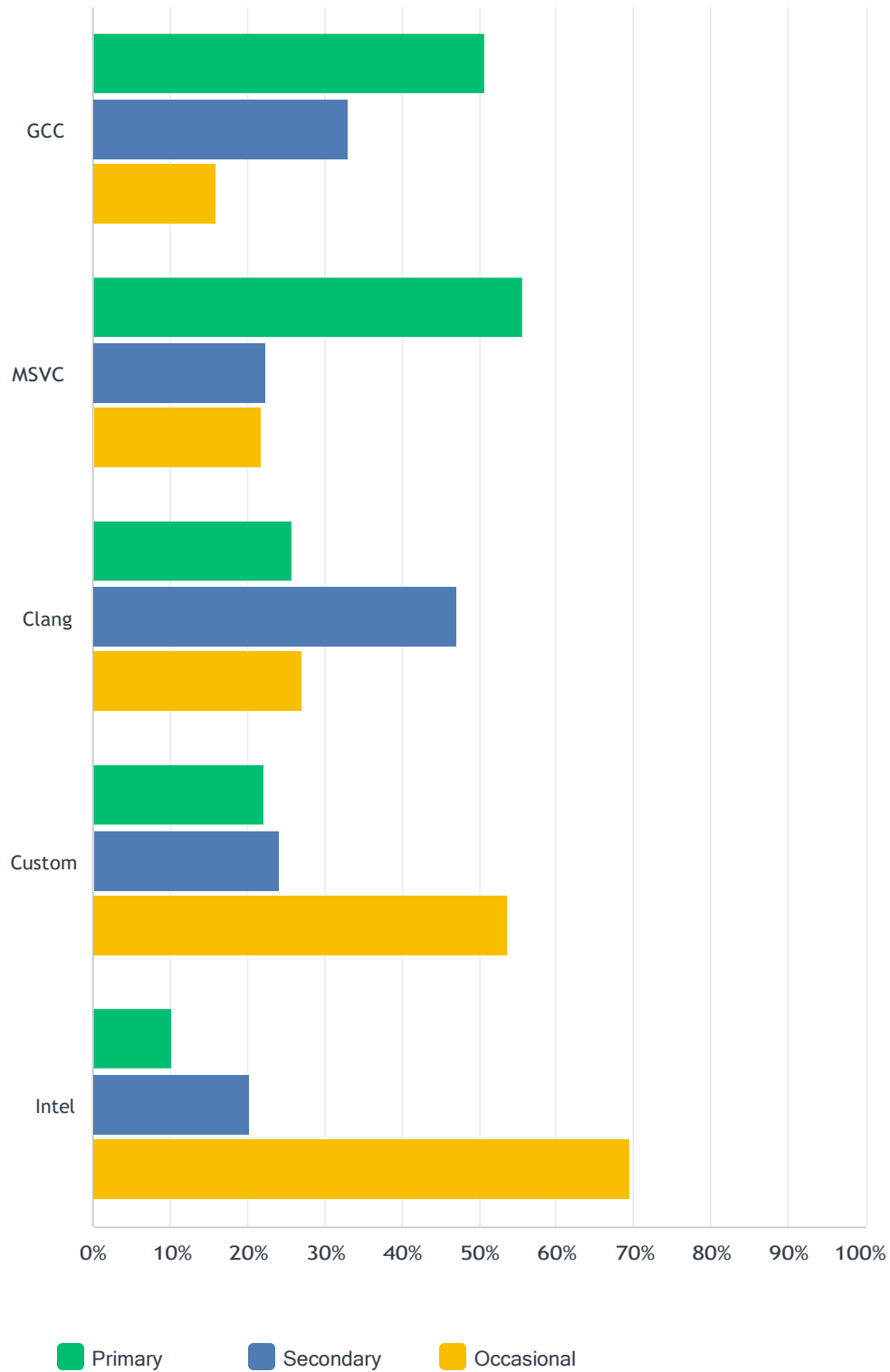


# 2023 Annual C++ Developer Survey "Lite"

	PRIMARY	SECONDARY	OCCASIONAL	TOTAL	WEIGHTED AVERAGE
Visual Studio	64.49% 632	23.67% 232	11.84% 116	980	2.53
Emacs	64.38% 94	21.92% 32	13.70% 20	146	2.51
Code Insight	50.00% 1	50.00% 1	0.00% 0	2	2.50
Visual Studio Code	38.72% 419	43.35% 469	17.93% 194	1,082	2.21
CLion	49.08% 133	21.03% 57	29.89% 81	271	2.19
Rider	42.86% 12	25.00% 7	32.14% 9	28	2.11
Vim	37.50% 192	29.10% 149	33.40% 171	512	2.04
KDevelop	34.38% 11	34.38% 11	31.25% 10	32	2.03
Webstorm	33.33% 1	33.33% 1	33.33% 1	3	2.00
Qt Creator	33.21% 91	28.10% 77	38.69% 106	274	1.95
Eclipse	32.84% 22	23.88% 16	43.28% 29	67	1.90
Sublime	20.20% 20	40.40% 40	39.39% 39	99	1.81
Kate	23.08% 9	30.77% 12	46.15% 18	39	1.77
XCode	18.75% 30	33.75% 54	47.50% 76	160	1.71
Source Insight	33.33% 1	0.00% 0	66.67% 2	3	1.67
Code::blocks	14.29% 2	35.71% 5	50.00% 7	14	1.64
Netbeans	14.29% 1	28.57% 2	57.14% 4	7	1.57
Intellij IDEA	8.11% 3	35.14% 13	56.76% 21	37	1.51
Atom	0.00% 0	50.00% 3	50.00% 3	6	1.50
CodeLite	0.00% 0	50.00% 1	50.00% 1	2	1.50
Android Studio	2.63% 2	15.79% 12	81.58% 62	76	1.21

## Q17 C++ 개발할때 어떤 컴파일러 쓰세요?

Answered: 1,708 Skipped: 18





# 2023 Annual C++ Developer Survey "Lite"

	PRIMARY	SECONDARY	OCCASIONAL	TOTAL	WEIGHTED AVERAGE
GCC	50.84% 695	33.14% 453	16.02% 219	1,367	2.35
MSVC	55.70% 650	22.45% 262	21.85% 255	1,167	2.34
Clang	25.78% 337	47.21% 617	27.01% 353	1,307	1.99
Custom	22.22% 12	24.07% 13	53.70% 29	54	1.69
Intel	10.14% 7	20.29% 14	69.57% 48	69	1.41

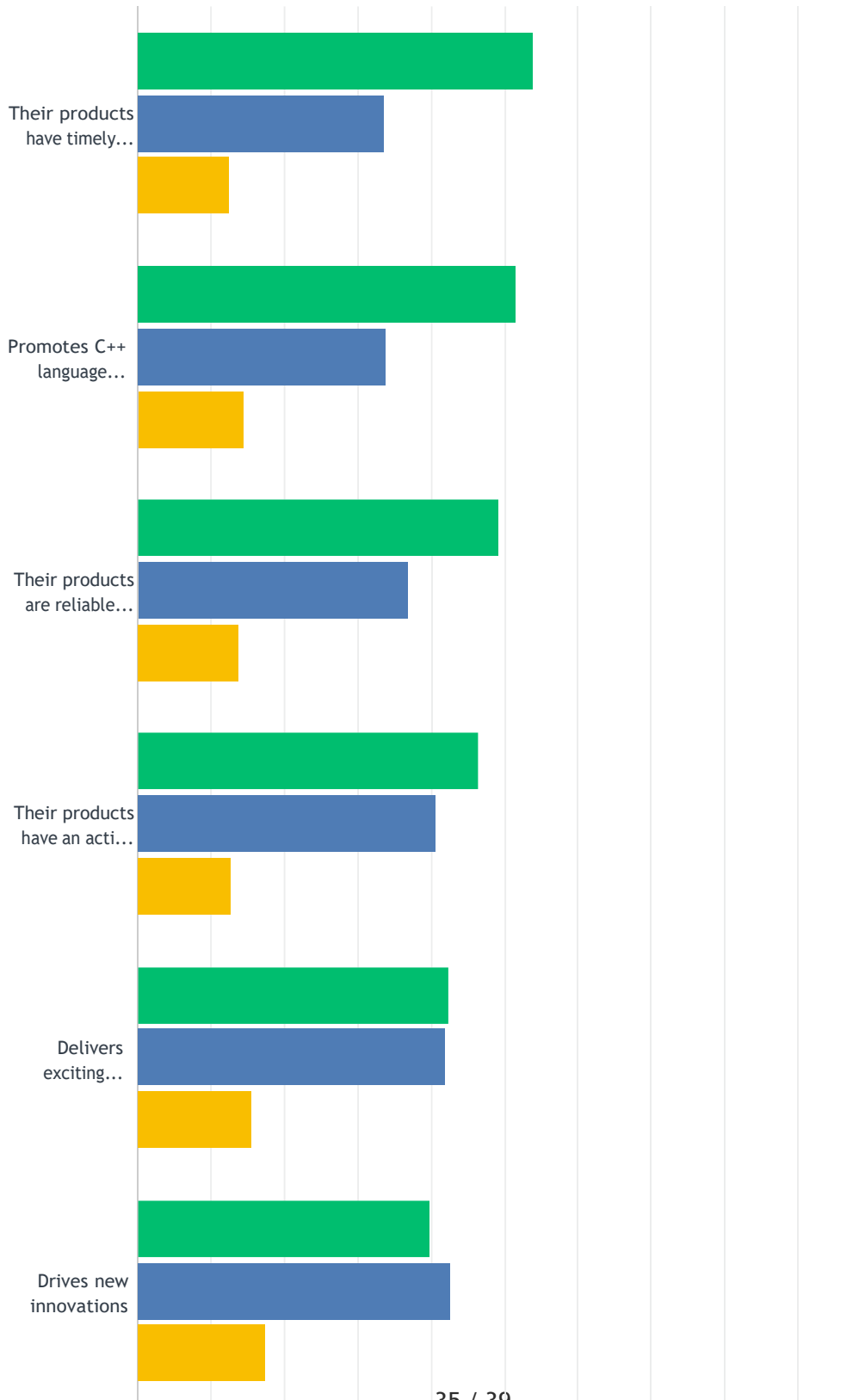
## Q18 C++ 과 관련된 여러 조직 중에 떠오르는 조직은?

Answered: 887 Skipped: 839

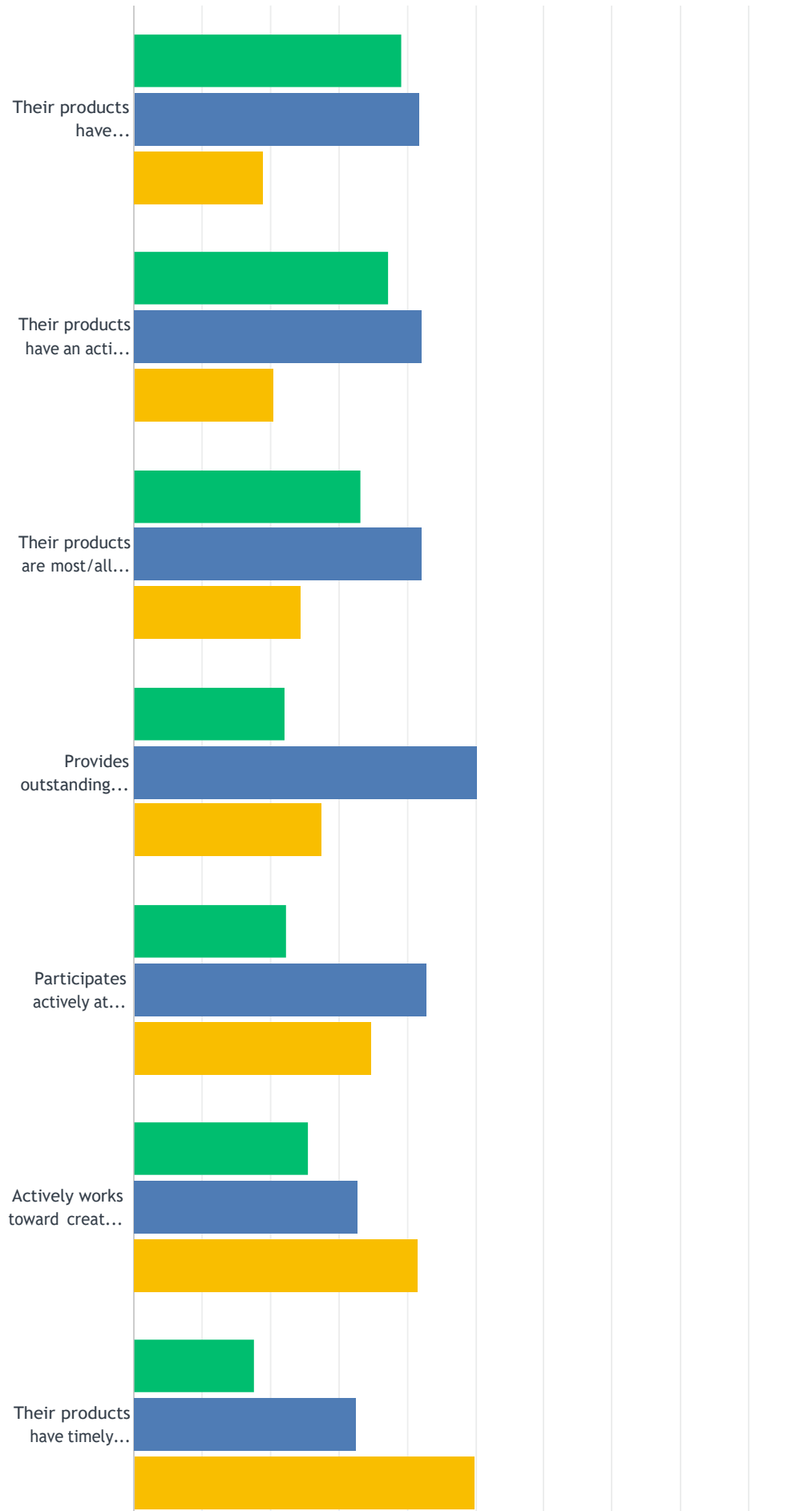
abseil accu adobe apple bloomberg boost  
clang **committee** cpp cppcon cppreference  
epic facebook foundation gcc gnu **google**  
intel **iso** isocpp jetbrains kitware llvm meta  
**microsoft** ms msvc none nvidia qt  
**standard** stl studio unreal visual wg yandex

Q19 C++과 관련된 조직들의 여러 활동들이 있습니다.  
각 활동들에 대해서 당신에게 중요한 일입니까?

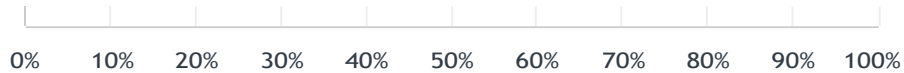
Answered: 1,563 Skipped: 163



## 2023 Annual C++ Developer Survey "Lite"



# 2023 Annual C++ Developer Survey "Lite"

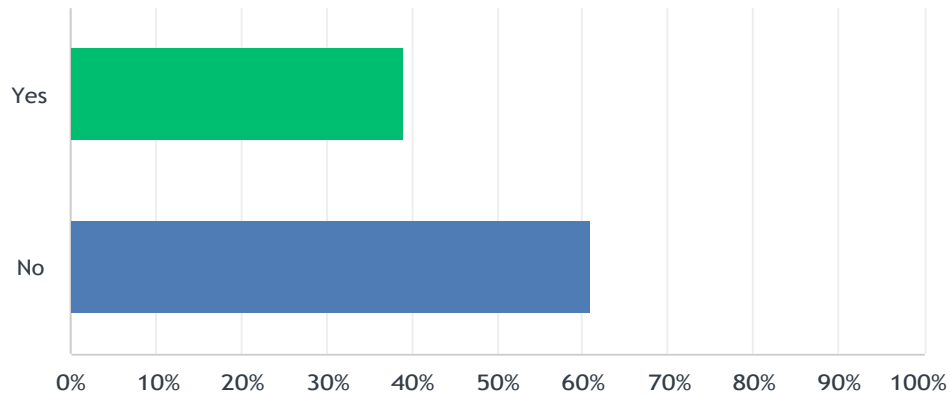


■ Very import...
 ■ Somewhat i...
 ■ Not import...

	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT	TOTAL	WEIGHTED AVERAGE
최신 C++을 적시에 지원함	53.87% 829	33.59% 517	12.54% 193	1,539	2.41
업무에 C++ 언어의 진화가 내 업무에 도움이 되는 방향으로 축진한 것.	51.53% 791	33.94% 521	14.53% 223	1,535	2.37
신뢰할 수 있고, 이전 버전과 호환성이 있는 것.	49.15% 752	36.93% 565	13.92% 213	1,530	2.35
활발한 커뮤니티를 가지고 있는 것.	46.42% 707	40.71% 620	12.87% 196	1,523	2.34
흔히 발생하는 문제에 대해 해결책을 제공하는 것	42.49% 648	42.03% 641	15.48% 236	1,525	2.27
Drives new innovations	39.88% 605	42.58% 646	17.53% 266	1,517	2.22
Their products have high-quality training materials	39.28% 601	41.76% 639	18.95% 290	1,530	2.20
Their products have an active open source community	37.39% 571	42.24% 645	20.37% 311	1,527	2.17
Their products are most/all open-sourced	33.27% 510	42.27% 648	24.46% 375	1,533	2.09
Provides outstanding customer support and servicing	22.11% 336	50.39% 766	27.50% 418	1,520	1.95
Participates actively at conferences (e.g., talks, booths)	22.41% 342	42.79% 653	34.80% 531	1,526	1.88
Actively works toward creating a more diverse and inclusive C++ community	25.61% 391	32.87% 502	41.52% 634	1,527	1.84
Their products have timely support for the latest C standard	17.65% 269	32.55% 496	49.80% 759	1,524	1.68

Q20 여러분들이 어떤 개발자 도구, 서비스를 선택하는데 있어서,  
위 조직들이 해당 커뮤니티에 참여하고 있는지 아닌지가 중요한가요?

Answered: 1,584 Skipped: 142



ANSWER CHOICES		RESPONSES	
Yes		39.02%	618
No		60.98%	966
TOTAL			1,584

Q21 마법의 지팡이가 있다면, C++ 어떤 것을 한가지를 바꾸고 싶나요?

Answered: 1,176 Skipped: 550

A word cloud of C++ topics that developers would like to change if they had a magic wand. The words are arranged in a roughly rectangular shape, with some words being significantly larger than others. The colors are various shades of blue. The words include: abi, backwards, break, build, change, cargo, cmake, committee, compatibility, complexity, const, conversions, default, dependencies, enum, epochs, error, everything, exceptions, faster, function, generation, handling, header, implicit, include, initialization, interface, learn, macros, matching, messages, modules, networking, package, pain, pattern, platform, python, reflection, remove, requires, rust, safety, simplify, std, stop, string, template, and version.

abi backwards break build  
change  
cargo cmake committee  
compatibility complexity const  
conversions default dependencies  
enum epochs error everything exceptions faster  
function generation handling header implicit include  
initialization interface learn macros matching messages modules  
networking package pain pattern platform python  
reflection remove requires  
rust safety simplify std stop string  
template version