

# INTRODUCTION

Compilers, IDEs, Hello World

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Name	OS	License	C++11	C++14	C++17
Intel	Most	Proprietary	Partial	Partial	No
MS Visual C++	Most	Proprietary	Yes	Partial	Partial
Clang	All	MIT-like	Yes	Yes	Partial
GCC	All <sup>1</sup>	GPLv3	Yes	Yes	Partial

Source

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<sup>1</sup>Using external software for Windows

Name	OS	License	Autocomplete	Tools
Visual Studio	Windows	Proprietary	Complex	Most <sup>2</sup>
Eclipse CDT	Java	EPL	Complex	Most <sup>2</sup>
Xcode	OS X	Proprietary	Complex	Most <sup>2</sup>
CLion	Java	Proprietary	Complex	Many <sup>3</sup>
Qt Creator	All	LGPL	Complex	Many <sup>4</sup>
Geany	All	GPL	Simple	Class Browser

Source

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<sup>2</sup>GUI builder, class browser, toolchain, debugger, profiler, refactoring, code coverage

<sup>3</sup>Except for code coverage, GUI builder, profiler

<sup>4</sup>Except for code coverage

# HELLO WORLD

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```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     cout << "Hello World!\n";
6     return 0;
7 }
```

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Compile with:

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```
g++ -std=c++14 -Wall -Wextra hello_world.cpp
```

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```
1 #include <iostream>
2 #include <string>
3 using namespace std;
4
5 int main() {
6     cout << "Please enter your name: ";
7     string name;
8     cin >> name;
9     cout << "Hello " << name << "!\n";
10    return 0;
11 }
```

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## FORMATTING OUTPUT

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```
1 #include <iostream>
2 #include <iomanip>
3 #include <string>
4 using namespace std;
5
6 int main() {
7     cout << "Please enter the height and width:\n";
8     int height, width;
9     cin >> height >> width;
10    cout << "Height: " << setw(4) << height << "\n";
11    cout << "Width:  " << setw(4) << width << "\n";
12    cout << "Area:    " << setw(4)
13         << height * width << "\n";
14    return 0;
15 }
```

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```
1 // string
2 string a = "abcde";
3 char b = a[4];
4 char c;
5 c = 'e';
6
7 // integer
8 int d = 42;
9 int e, f = 12;
10 // what's the value of e?
11
12 // float
13 float g = 13.37;
```

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## MORE DATA TYPES

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```
1 // similar to int
2 short f = 5;
3 long g = 58123745931245832458L;
4
5 // similar to double
6 double h = 123456789.123456789;
7
8 // int again...
9 unsigned int i = 1337U;
10
11 // and to interpret conditions
12 bool a = false;
13 bool b;
14 b = !a;
```

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```
1 // basic maths
2 int a = 12,
3     b = 15;
4
5 int c = a + b;
6 c += b;
7
8 d = a - b;
9 d -= a * b;
10 e *= d;
11
12 f = a + b / b;
13 f /= c;
```

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```
1 // basic programming tools
2 int a = 12,
3     b = 15;
4
5 int c = b % a;
6 int d = a++;
7 int e = ++a;
8
9 --d;
10 e--;
```

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## OPERATIONS - INTEGER

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```
1 #include <iostream>
2 using namespace std;
3
4 int main() {
5     long int a = -5, b = 16;
6     unsigned int c = a;
7     long unsigned int d = a;
8     short int e = c;
9     long int f = e, g = c;
10    cout << "a: " << a << "\n" "b: " << b << "\n";
11    cout << "c: " << c << "\n" "d: " << d << "\n";
12    cout << "e: " << e << "\n" "f: " << f << "\n";
13    cout << "g: " << g << "\n";
14    return 0;
15 }
```

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```
1 // concatenation
2 string a = "Hello ",
3         b = "World!";
4 string c = a + b;
5 string d = "Hello" "World!";
6
7 // characters
8 char e = 'e';
9 char f = e + 1;
```

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## OPERATIONS - COMPARISON

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```
1 bool a = true, b = false;
2 bool c = a == b;
3
4 if (a != b) {
5     bool d = a > b;
6     d = !(a <= b);
7 }
8
9 bool e = a && b;
10 bool f = a || b;
```

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---

```
1  int a = 12, b = 6;
2
3  int c = a & b;
4  int d = a | b;
5
6  int e = ~a;
7
8  int f = a ^ b;
9
10 int g = a << b;
11 int h = a >> b;
```

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## COMPOUND OPERATORS

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```
1  int a = 12, b = 6;  
2  
3  a += b; a += b;  
4  a *= b; a /= b;  
5  
6  a %= b;  
7  
8  a &= b;  
9  a |= b;  
10  
11 a ^= b;  
12  
13 a <<= b;  
14 a >>= b;
```

---





# LOOPS

---

```
1  int amount = 5;
2  string text = "test";
3
4  while (amount > 0) {
5      cout << text << "\n";
6      --amount;
7  }
8
9  for (int i = 0; i < amount; ++i) {
10     cout << text << "\n";
11 }
12
13 for (auto i : text) {
14     cout << i << "\n";
15 }
```

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# LOOPS

---

```
1 int amount = 200;
2 string text = "test";
3 string longer_text = "";
4
5 while (amount > 0) {
6     longer_text += text;
7     if (longer_text.size() > 100) {
8         continue;
9     }
10    if (longer_text.size() > 120) {
11        break;
12    }
13 }
```

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# FUNCTIONS

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```
1 void myPrint(string parameter) {
2     cout << parameter << "\n";
3 }
4
5 int triangleArea(int sideA, int sideB) {
6     return sideA * sideB / 2;
7 }
8
9 int faculty(int nr) {
10     if (nr > 0) {
11         return nr * faculty(nr - 1);
12     } else {
13         return 0;
14     }
15 }
```

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