

C++ Exceptions

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C++ Exceptions

When executing C++ code, different errors can occur: coding errors made by the programmer, errors due to wrong input, or other unforeseeable things.

When an error occurs, C++ will normally stop and generate an error message. The technical term for this is: C++ will throw an **exception** (throw an error).

C++ try and catch

Exception handling in C++ consist of three keywords: `try`, `throw` and `catch` :

The `try` statement allows you to define a block of code to be tested for errors while it is being executed.

The `throw` keyword throws an exception when a problem is detected, which lets us create a custom error.

The `catch` statement allows you to define a block of code to be executed, if an error occurs in the try block.

The `try` and `catch` keywords come in pairs:

Example

```
try {  
    // Block of code to try  
    throw exception; // Throw an exception when a problem arise  
}  
catch () {  
    // Block of code to handle errors  
}
```

Consider the following example:

Example

```
try {  
    int age = 15;  
    if (age > 18) {  
        cout << "Access granted - you are old enough."  
    } else {  
        throw (age);  
    }  
}  
catch (int myNum) {  
    cout << "Access denied - You must be at least 18 years old.\n";  
    cout << "Age is: " << myNum;  
}
```

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Example explained

We use the `try` block to test some code: If the `age` variable is less than `18`, we will `throw` an exception, and handle it in our `catch` block.

In the `catch` block, we catch the error and do something about it. The `catch` statement takes a **parameter**: in our example we use an `int` variable (`myNum`)

(because we are throwing an exception of `int` type in the `try` block (`age`)), to output the value of `age` .

If no error occurs (e.g. if `age` is `20` instead of `15` , meaning it will be greater than 18), the `catch` block is skipped:

Example

```
int age = 20;
```

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You can also use the `throw` keyword to output a reference number, like a custom error number/code for organizing purposes:

Example

```
try {
    int age = 15;
    if (age > 18) {
        cout << "Access granted - you are old enough.";
    } else {
        throw 505;
    }
}
catch (int myNum) {
    cout << "Access denied - You must be at least 18 years old.\n";
    cout << "Error number: " << myNum;
}
```

Run example »

Handle Any Type of Exceptions (...)

If you do not know the **throw type** used in the **try** block, you can use the "three dots" syntax (`...`) inside the **catch** block, which will handle any type of exception:

Example

```
try {
    int age = 15;
    if (age > 18) {
        cout << "Access granted - you are old enough.";
    } else {
        throw 505;
    }
}
catch (...) {
    cout << "Access denied - You must be at least 18 years old.\n";
}
```

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