Jaydeep Shah
radhey4ec@gmail.com
<self learning notes>

Exception in C++

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++ supports three keywords for this purpose : "try", "throw", "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.

NOTE: A function-try-block associates a sequence of catch clauses with the entire function body, and with the member initializer list (if used in a constructor) as well. Every exception thrown from any statement in the function body, or (for constructors) from any member or base constructor, or (for destructors) from any member or base destructor, transfers control to the handler-sequence the same way an exception thrown in a regular try block would. **(TRY and CATCH must be in same function / block otherwise error generated)**

Example:

```cpp
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;

}
```

TRY BLOCK:

Before executing process or starting calculation, try block allow us to check given data as per our requirement or not, if not then "Throw" error (Throw error number / custom error number)

CATCH BLOCK:

Catch block use to take error number and use it for further procedure

When you want to handle all error with single block:

```
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";

}
```

EXTRA NOTE:

-If error is serious in catch block, then we can use exit()
or abort() function for terminating program instantly.
- If any of either exit() or abort() called then further code
will not execute by machine.
- <stdlib.h> is required for using above function.

Difference between exit() and throw() :

1) exit() is preferred, it wound the stack and used
memory.
2)abort() immediately terminate the program, but
program stack is unwounded, and all open files will be
close.

Note : in C++ , terminate() function is use for
terminate running program instantly. It does not
require any library to include.