Console Input

The `cin` (*see-in*) standard input stream can read and convert user input, and store it into different kinds of variables. This is called **formatted input**, and it uses the **extraction operator** (`>>`) to read (extract) data from input, **convert it and store** the results in a variable.

Here's an example:

```
cout << "Enter limit: ";  // prompt
int limit;                // variable to hold the value
cin >> limit;             // read, convert and store
```

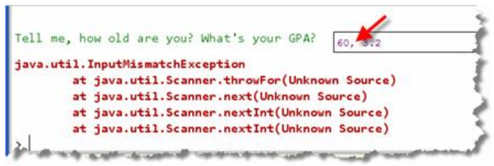
When a user types `123` in response when prompted for `limit`, the input is three `ASCII` character values `'1'`, `'2'`, `'3'`. These are stored sequentially in memory, and then, when the user types `ENTER`, the three `char` values are **combined and converted** from text into to the **`int`** `123`, which looks like this in memory:

```
0000-0000 0000-0000 0000-0000 0111-1011
```

This process—turning human-readable text into binary numbers, (and it's the reverse), is the job of **parsing** or **conversion**. **The `cin` object does this for us.**

Input Errors

If the user **types an unexpected input value** in Java or C# or Python, the system **prints an error message on the console**, and terminates the program.



```
Tell me, how old are you? What's your GPA?   60, 3.2
java.util.InputMismatchException
        at java.util.Scanner.throwFor(Unknown Source)
        at java.util.Scanner.next(Unknown Source)
        at java.util.Scanner.nextInt(Unknown Source)
        at java.util.Scanner.nextInt(Unknown Source)
>
```

This is a **runtime error** or **exception**, detected when your program runs, rather than when you compile it. **C++ uses a different technique**.

Instead of causing a runtime error and stopping, the input stream is **placed in an invalid state**, and stops receiving input. In C++ when the comma is encountered, your program **doesn't crash**. You'll learn how to handle these kinds of errors soon.