

# Input and Output Streams

Input and output streams allow a C++ program to communicate.

## Input and output streams

- are one of the oldest parts of C++.
- are a framework which is designed for extensibility.
- combine object oriented and generic ideas.

## Streams

- are infinite data streams from which you can extract characters or insert them.

# Input and Output Streams

## Stream classes


- `std::istream` for reading of data
- `std::ostream` for writing of data

## Predefined stream objects

Stream (channel)	C equivalent	Device	Buffered
<code>std::cin</code>	<code>stdin</code>	keyboard	yes
<code>std::cout</code>	<code>stdout</code>	monitor	yes
<code>std::cerr</code>	<code>stderr</code>	monitor	no
<code>std::clog</code>		monitor	yes

# Input and Output Streams

## Stream operators

- <<: inserts characters into the output stream ("Insertor")
- >>: extracts characters from the input stream ("Extractor")
- Both operator can be chained  return a reference

## Stream manipulators

Manipulator	Stream type	Meaning
<code>std::endl</code>	Out	Writes "\n" and flushes the output buffer
<code>std::flush</code>	Out	Flushes the output buffer
<code>std::ws</code>	In	Discards leading whitespace while reading