C++ Text Justifier — API Calls Used (with Context)

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[iostream]

1) std::cin >> w

• Reads the next whitespace-delimited word into w.

• In while (std::cin >> w), the loop runs until EOF/failure (then it stops).

2) std::cout << line << '\n'

• Prints each finished line followed by a newline.

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[std::vector<std::string>] // dynamic arrays of words/lines

• words.push\_back(w)

- Add the newly read word to the list of all input words.

• L.push\_back(w)

- Add a word to the current line being constructed.

• output.push\_back(justifyLine(L, width))

- Store the finished, justified line as a string.

• output.push\_back(w)

- Store a very long word as its own line (no hyphenation).

• L.size() / line\_words.size()

- Number of words in the vector. Used to compute:

· n\_words for the fit test, and

· words\_remaining for space distribution, and

· loop bounds.

• L.empty() / line\_words.empty()

- True if no words. Used to skip justifying an empty/current line and handle empty input.

• L.clear()

- Reset the current line after pushing a finished line to output.

• line\_words.front()

- Get the only word when a line has a single word (returned as-is).

• line\_words[i]

- Random access to the i-th word when assembling a justified line.

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[std::string] // mutable text buffers

• w.size() / s.size()

- Character count of a word/string. Used for width checks and letter totals.

• line.push\_back(' ')

- Insert a single space between words in leftAlign().

• line += line\_words[i] and line += w

- Append an entire word to the output line.

• line.reserve(width)

- Preallocate space for the final line length (avoid reallocations while building).

• line.append(s, ' ')

- Append s spaces at once during justification.

• return std::string()

- Return an empty string if there are no words to justify.

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[functions]

• read\_words\_from\_stdin()

- Reads all words from stdin into a std::vector<std::string>; stops at EOF.

• leftAlign(line\_words)

- Joins words with single spaces (used for the last output line).

• justifyLine(line\_words, width)

- Builds a fully justified line by distributing spaces across the inter-word gaps

using integer division of the remaining spaces by the remaining gaps.

• build\_output\_lines(words, width)

- Packs words into lines. Fully justifies completed lines. Left-aligns the final line.

- If a word is longer than width, stores it as its own unbroken line.

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[Types / operators & patterns]

• std::size\_t

- Unsigned size type (matches container .size()). Used for counts and indices.

• const auto& w : words

- Range-based loop giving a read-only reference to each existing string (no copies).

• s = spaces\_remaining / words\_remaining

- Integer division to decide how many spaces to put in the current gap while

justifying a line.