



# NEW TECHNOLOGISTS

## SECOND ROUND QUESTIONNAIRE

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*Answer all questions and email back as a PDF file titled "Full Name\_NT24.pdf".  
Responses should not exceed more than 300 words for each question.*

1. What's a big question or problem in the tech field you'd like to solve and why?
2. Think of a time when you went from beginner to proficient on a topic or skill. How could you achieve that change more efficiently or easily next time?
3. How would you redesign your favorite app? What would you add or change and why?
4. Innovative and high-performing teams require active collaboration. Please describe an experience you've had that indicates you can thrive in a similar setting.
5. We understand that you are a multifaceted individual with various experiences that have shaped who you are today. Please fill in the blanks below and feel free to expand on your answer.

Fill in the blanks: I am \_\_\_\_\_ because of \_\_\_\_\_.

6. The following pages contain three (3) sections.
  - Section 1: The Prompt
  - Section 2: The ChatGPT Code Solution
  - Section 3: Your Responses

Please read section 1 and 2 carefully to answer the questions listed in Section 3 "Your Responses."

## Problem Description

Conversational AI can answer a variety of questions, and even write solutions to trivial problems. We're going to look at one solution AI has provided. Let's dive in!

We put a prompt in ChatGPT and got a pretty thorough C++ solution. To help you organize your thoughts for this problem we're going to guide you through three (3) sections:

1. **The Prompt** – We will show you the leetcode-like question we inputted into ChatGPT. You do not need to answer the prompt directly, only answer the questions under the section "**Your Responses**".
  - a. This prompt is broken into three sections which build on top of each other.
  - b. The final coding solution from ChatGPT should solve and account for each variance or additional requirement.
  - c. ChatGPT's solution should also account for assumptions listed in the prompt.
2. **The ChatGPT Code Solution** – We added some comments to make it clearer what the solution is attempting to do.
3. **Your Responses** – There will be five (5) questions you will be answering and will be referring to the prompt and code to answer these questions. Again, the prompt and code are for reference.

Let's begin!

### 1. The Prompt

Below is the prompt we inputted into ChatGPT.

*During software development, engineers often must break up data to process it much more efficiently. In this scenario, a team in the office has their dataset in a long string of text which is great for their use, but not for our servers to do anything meaningful with! To do that, we need a function that takes the string and separates them into chunks or "words" as we will call it. Given a string of any length, output an array of the string as "words" of the given length.*

*Before getting started, some assumptions you should consider in your solution include:*

- *Assume whitespaces could be present and remove them*
- *The input string may contain any character from: a-z, A-Z, or 0-9*
- *The shortest word must appear at the end of the output array*
- *Some edge cases exist that are not disclosed. In your solution, consider some possible inputs that fall outside the normal bounds of the question.*

*Example 1: Input of "abcdefghijklmnopqrstuvwxy" "4" should output ["abcd", "efgh", "ijkl" "mnop", "qrst", "uvwxy", "yz"]*

*Example 2: Input of "hellomywonderfulfriend2000" "5" should output ["hello", "mywon", "derfu", "lfrie", "nd200", "0"]*

*Some data outputs needed by the server are more complex and require some extra manipulation. To fit the data model, they use a range to represent the alternating sizes of the words in the output string. Modify your solution to work in both scenarios.*

*Example 1: Input of "abcdefghijklmnopqrstuvwxy" "4-6" should output ["abcd", "efghij", "klmn", "opqrst", "uvwxy", "yz"]*

*Example 2: Input of "hellomywonderfulfriend2000" "1-5" should output ["h", "ellom", "y", "wonde", "r", "fulfr", "i" "end20", "0", "0"]*

*Not everyone is perfect, including machines. Some datasets need to be sorted so that they can be understood correctly by certain programs. Modify your solution such that the "words" in the output array are sorted using a self-written algorithm. Assume standard sorting of numbers. Uppercase before lowercase.*

*Example 1: Input of "abcdEfghijklmnoPqrsTuvwxy" "4-6" should output ["Efghij", "abcd", "klmn", "oPqrsT", "uvwxy", "yz"]*

*Example 2: Input of "hellomywonderfulfriend2000" "1-5" should output ["0", "0", "ellom", "end20", "fulfr", "h", "i", "r", "wonde", "y"]*

## 2. The ChatGPT Code Solution

From the prompt above this is the C++ solution ChatGPT has provided us.

```
#include <iostream>
#include <vector>

using namespace std;

vector<string> split_string(string str, string range_str) {
    // 1. Declare variables which will be used or returned.
    vector<string> result;
    int start_len, end_len;
```

```

// 2. Parse the range_str for the function
sscanf(range_str.c_str(), "%d-%d", &start_len, &end_len);

// 3. Remove whitespaces from the string
str.erase(remove(str.begin(), str.end(), ' '), str.end());

// 4. Loop through the string
int pos = 0;
while (pos < str.length()) {
    // 5. Determine the length of the next word
    int len = rand() % (end_len - start_len + 1) + start_len;

    // 6. Make sure we don't go past the end of the string
    if (pos + len > str.length()) {
        len = str.length() - pos;
    }

    // 7. Add the word to the result array
    string word = str.substr(pos, len);
    result.push_back(word);

    pos += len;
}

// 8. Sort the words using a custom comparison function
sort(result.begin(), result.end(), [](const string& a, const string& b) {
    string::const_iterator ita = a.begin(), itb = b.begin();
    while (ita != a.end() && itb != b.end()) {
        if (isdigit(*ita) && !isdigit(*itb)) {
            return true;
        } else if (!isdigit(*ita) && isdigit(*itb)) {
            return false;
        }
        ++ita; ++itb;
    }
    return a < b;
});

```

```

        } else if (isupper(*ita) && !isupper(*itb)) {
            return true;
        } else if (!isupper(*ita) && isupper(*itb)) {
            return false;
        } else if (*ita < *itb) {
            return true;
        } else if (*ita > *itb) {
            return false;
        } else {
            ++ita;
            ++itb;
        }
    }
    return a.length() < b.length();
});

```

```

// 9. Return the result computed
return result;
}

```

```

int main() {
    string str = "abcdEfghijklmnoPqrsTuvwxyz";
    string range_str = "4-6";
    vector<string> result = split_string(str, range_str);
    for (const auto& word : result) {
        cout << word << " ";
    }
    cout << endl;
    return 0;
}

```

### ChatGPT Solution Code Sections:

1. Declare
2. Parse
3. Remove whitespace
4. Loop through the string
5. Determine length of next word
6. Out of bounds check
7. Add to result
8. Sorting the list
9. Return result

### 3. Your Responses

Now, we know that was a lot of information we just gave you! Let's dive into some questions and please continue to refer to the prompt and solution above to respond to the following questions below.

- a) Does this solution correctly solve the entire prompt given? What parts of the prompt did ChatGPT do correctly? If you refer to the code, you may use the numbered sections with the description above to refer with in lieu of pasting code. (ex: In section 1. (declare), the solution...)
- b) Where does ChatGPT's solution fall short? As in, **what did it not correctly solve or account for?****
- c) Taking the given solution, what would you do better and improve upon? You do not need to provide a completely rewritten solution, but we encourage you to at least use code snippets to support your improvements.
- d) What are the advantages and pitfalls of using a conversational AI to solve problems? How do you believe ChatGPT came to the given solution?
- e) How do you see yourself incorporating AI in your future tech career?

### Tips and Guidelines:

- It's okay if you do not know C++. This question is open book and you're able to freely use the Internet. We strongly encourage you to research every function and piece of code you do not understand so you may answer the question.
- For part 3, you may use the following languages for parts of a rewritten solution or code snippets: C++, C#, Python, Java, Javascript, Typescript, and Swift. You are encouraged to use the language you know best. We will not score based on the language you choose from the selection.
- We encourage you to explain any code you write.
- Do not be concerned with the code in the `int main()` section. This is just driver code for outputting the solution. We are only concerned about the `split_string()` solution.

***Each response to a bullet point should not exceed more than 300 words, excluding code snippets or graphical examples that support your responses. Please clearly denote which sections of your response correspond to the appropriate bullet point.***