Color coding

- Output instructions:
    - format (i.e. length, paragraph, bullet-points, specificity, etc.),
    - content components
- Project context
- Role assignment
- Course context/definitions: Definitions, Required features/components, Project expectations/scope
- Examples

Prompt 1 – Role Assignment and Course Project Scope:

Hi ChatGPT! You are an expert software engineer with extensive experience in the requirements stage of software development, particularly for mobile applications. You will aid in requirements synthesis and elicitation for an Android mobile application. Your primary responsibility will be to refine, clarify, and expand upon an initial set of requirements provided for the Android mobile application. This involves ensuring that the requirements are comprehensive, feasible, and aligned with the application's goal. Please consider the time, expertise, and technical constraints provided below.

The development of the application will be carried out by a group of 4 students of a software engineering course over the course of 3 months. The project is intended to be a client-server software system with the client (front-end) running on a mobile device and the server (back-end) running in the cloud. It must include the following four components:

1. Use of an external authentication service, e.g., Google or Facebook authentication.
2. Use of at least one additional external service accessible via an API, e.g., Google calendar, Google maps, etc.
3. Real-time updates, e.g., multi-user chats, push notification, etc.
4. Non-trivial logic in either front-end or back-end component (i.e., something that involves an algorithm, not a simple API call or database read/update/delete).

I will provide you with my application idea and initial requirement specifications in the next prompt.

Prompt 2 – Project Context:

The idea for my mobile application is a <FULL TITLE>, called <NAME>.

The project description is:
<DESCRIPTION>

Below are the main actors, functional requirements, and non-functional requirements. Each functional requirement has a name, short description (1-2 sentences), primary actor(s), success scenario(s), failure scenario(s).

<INITIAL SPECIFICATION>

If the project idea and initial requirement specifications are clear, please respond with a 2-3 sentence description of the project. If not, please identify what is unclear.

Prompt 3-4 – Actors:

- Let's start with the main actors: <ACTORS>.
  <ACTORS DEFINITION>
  Given this definition and the functional requirements, **should additional actors be added or should any actors be removed**? If so, please provide a justification. In the case of an added actor, identify the functional requirements to which the actor should be added as a primary actor.
- **(if new actor proposed)** Great! Let's **add** the <NEW ACTOR> to <FRs>
  OR Great! Let's add the <NEW ACTOR> to the list of main actors. We will figure out what functional requirement it belongs to later.

Prompt 5-6 – FR satisfaction of project components:
- Let's move on to refine the functional requirements. Recall, the functional requirements are: <FRs>

  Consider the four four required components:
  1. At least one functional requirement uses an external authentication service
  2. At least one functional requirement uses one additional external service
  3. At least one functional requirement incorporates real-time updates
  4. All functional requirements require non-trivial logic

  Do the functional requirements satisfy the required components? Consider each component one at a time. If all components are satisfied, then the functional requirements satisfy the project component expectations. If not, please identify any components that are not satisfied and provide justification why.
- **(if vague suggestions or if too many FRs) How should the functional requirements be refined**?
  Please arrive to 6 non-trivial functional requirements with an updated name, description (1-2 sentences) that reflects its functionality, and primary actors. You may remove previously defined functional requirements and come up with new ones that ensure the project components are satisfied (i.e. include functional requirements that utilize an external authentication service, an additional external service, and non-trivial logic).

  Below is a definition and examples of functional requirements. Please consider these when providing refined functional requirements.
  <FR DEFINITION>

Prompt 7-29 – FR improvements (one at a time)
- Let's consider one functional requirement at a time. Let's start with functional requirement #1.
  <FR DEFINITION>

  For functional requirement <#>, please **refine the description** so that it is specific, verifiable, and measurable in 1-2 sentences. Please be concise, and only describe the functionality.
- Consider the success scenarios and failure scenarios of functional requirement <#>.
  <SS AND FS DEFINITIONS>

  Please **refine the success scenarios and failure scenarios** of functional requirement <#>. Ensure

the success scenarios and failure scenarios fully capture the functionality of the requirement, and add additional points that may have been missed in the initial specification. Recall that each failure scenario should correspond to a numbered item in the success scenario. The list of failure scenarios does not have to start at 1.

- **(If necessary)** We always use verbs at the start of a functional requirement title, denoting a use case. For functional requirement <#>, **please refine the title** so that it denotes a use case and reflects the description and functionality.
- For functional requirement <#>, consider the primary actor(s). Do **additional actors** need to be added? Recall that actors are people, devices, or other systems or services that interact with the system and are external to the system itself. The main actors defined for the project are <ACTORS>. If additional actors need to be defined or existing actors need to be modified, please explain why. **(If necessary)** You may not add the "System" as a primary actor.
- Please **put everything together and output functional requirement <#>**. Use the same format as before:
  - The name of the requirement (use case starting with a verb)
  - A short description of the requirement (1-2 sentences)
  - Primary actor(s)
  - Success scenario(s)
  - Failure scenario(s)

Prompt 30 – Actors updated

Next, let's **reconstruct** the list of main actors. The main actors are a list of actors that are primary actors in at least one functional requirement. Do not include actors that do not appear as a primary actor in any of the functional requirements, or "System". Given the updated functional requirements, **identify the main actors**. Consider each functional requirement one at a time. Then, once you have the main actors, **generate a description** in 1-2 sentences for each one.

Prompt 31 – UML Diagram

Next, create a UML **use-case diagram** as a LaTeX graph. First, please retrieve and output the title and primary actors of each updated/modified functional requirement. Then follow the steps sequentially:

1. Create a node for each main actor.
2. Create a node for each functional requirement. Please use the title of the functional requirement as its identifier. Remember, the title denotes a use case and should start with a verb.
3. For each functional requirement, add a connection between the functional requirement and each of its primary actors. Go step by step.
4. Add any additional use case diagram relationships if necessary.

Prompt 32-33 – NFRs

- Let's consider the non-functional requirements next.

  <NON-FUNCTIONAL REQUIREMENTS DEFINITION>

  The previously defined non-functional requirements were:
  <NFRs>

  Based on the definition and examples of non-functional requirements, do you have **suggestions**

for improvement? Please **provide comments for each non-functional** requirement, one at a time, and keep the scope and constraints of the project in mind.

- Let's **incorporate these suggestions** for improvement, clarification, and measurability into the non-functional requirements.

  Please **rewrite each requirement** with the improvements in the form of:
  - a textual description
  - an explanation for why this requirement is needed/relevant in 1-2 sentences
  - how the requirement will be validated in 1-2 sentences.

  Complete each non-functional requirement and ensure the improvements and clarifications have been made/included before moving on to the next one.

  As a reminder, please keep the scope and constraints of the project in mind.