1. **Identify and *briefly define* three important writing style characteristics for a document that describes requirements. (30 points)**

* **Unambiguous -** Each requirement must have only one meaning, which should not result with the reader having any doubt or feelings of vagueness.
* **Concise -** The requirements should be brief yet comprehensive, leaving no room for digression.
* **Necessary** - Every requirement must be essential to the product. Without it, the product would be incomplete.

1. **Identify and *describe* the importance of the actual technical documents (the 411W labs) to be written this semester in relation to the real world project life cycle. (50 points)**

The **descriptive paper (lab I)** provides top level descriptions of both, the product and the prototype. It persuades the reader by showcasing the product’s innovative aspects and its value in the real world. This is the last document that describes the product before construction of the prototype, and serves as the final summary of what the product is intends to do. At this point in the project life cycle, there should be no question about how the product works, or what it will do. The prototype is introduced here too. Prototype expectations such as goals, objectives, and challenges are documented here.

The **product specification (lab II)** refines the descriptive paper, specifies the prototype’s architecture, and defines the functional and performance requirements. It is crucial that all major requirements are covered because they serve as the basis for tests and furthermore, the user’s manual. The requirements can be seen as objectives of the real world project life cycle.

The **test plan and procedure requirements (lab III)** detail everything about the tests. This includes the procedures and the criteria for a test to pass. The tests serve as checkpoints which help to determine the progress of the real world project according to the requirements.

The **user’s manual (lab IV)** contains the instructions on how to operate the prototype. Just like a real world’s user’s manual, this manual needs to be easy to understand. It’s important for users to use the prototype properly, the way it was intended to be used. This is created at the end of the project life cycle.

1. ***List* three reasons why collaboration is beneficial in technical writing. (9 points)**

* Collaboration ensures a more effective use of individual talents, knowledge, and skills.
* Collaboration divides the workload of the projects.
* Collaboration provides more creativity, opinions, and different perspectives.

1. ***List* the relationships between requirement and test documentation. *Briefly define* the role of the traceability matrix have? (15 points)**

* The requirements documentation describes what the resources need to do, while test documentation identifies the resources required for the prototype.
* The tests in the test documentation demonstrates, validates, and measures functional and performance requirements of a system or product.
* Each test case in the test documentation is traceable to a functional requirement in the requirements documentation.

A Traceability Matrix is a table that correlates the functional/design documents to its associated test case documents. It determines the completeness of the relationship between the two documents.

1. ***List and briefly define* the advantages and disadvantages of prototyping during the development process? The answer must address each these factors: customer expectation, cost, risk, resource requirements, schedules, and technical complexity. (60 points)**

### Advantages

* **Quality:** Prototyping can improve the quality of requirements and specifications due the interaction between the customer and the producer.
* **Fixes Bugs Early:** Helps identify problems early in the design, which can then be changed easily as compared to making changes in the real product.
* **Refine Risks:** The prototype gives time to refine potential risks associated with the prototype.
* **Funding:** Since the product is visible to the users, it may attract funding.
* **Cost Effective:** Development costs are reduced for all of the above reasons.

### Disadvantages

* **Inadequate:** The prototype may not have nearly as much functionality as the real world product, making the prototype insufficient.
* **User Confusion:** Users may think the prototype is nearly identical to the final product, which may be drastically different.
* **Wasted Time**: Prototypes are supposed to be constructed quickly, but when the prototype is too complex, it can result in the final product being delayed.
* **High Cost**: The initial cost of the prototype can be too steep, which can lead restraining the functional requirements of the prototype.