1. **The problem could be the overall challenge of designing and engineering the best design for a multi-payload device, to successfully complete a water sampling and data collection process by controlling, coding, and connecting electronics from the primary payload to the secondary payload.**
   The assigned tasks include collecting a water sample from the secondary payload (1 foot suspended from primary payload) and lifting it to the primary payload. The tasks mentioned are necessary to allow the payload device to successfully complete all tasks and successfully retrieve a water sample and data collection.
2. **The measurands could be considered as:**
   1. The orientation of the device, whether it is right-side up, or upside down.
   2. The tilt angle
   3. object distance detection
   4. detection of water sourced based on humidity levels
   5. temperature
3. **A gyroscopic sensor would be used** to measure both the payload device's orientation and tilt angle based on which axis is in tilting motion. This is based on the knowledge needed to accomplish a task such as corresponding LED colors illuminate when right side up or upside down or displaying the tilt angle as visual text somewhere on the exterior of the payload device.

   LIDAR sensors (light detection and ranging) can be used to detect and avoid objects when approaching ±10 inches of an object; and in this case the payload device must emit a beep sound from the buzzer. To sense when our secondary device has been submersed enough in the water below, sensors such as float switch can be implemented in order to communicate with the device that the desired amount of resistance, caused by the float completing an electrical circuit as the float rises with the water level.

4. **Progressive steps that much be taken in order achieve maximum success for this final project could include** narrowing the focus to meet all customer requirements and ensuring that all engineering characteristics are satisfied to the best of abilities, this includes completing all assigned tasks within a timely manner.

By clearly identifying the customer requirements (assigned task) and meeting engineering characteristics such as being durable, waterproof, lightweight, reliable, high response time, float sensors, gyroscopic sensors, LIDAR sensors, water level sensors, ultrasonic sensors to sense distance from objects, temperature, and humidity module, etc. Reorder each engineering characteristic and customer requirement in chronological order based on highest priorities to be achieved first, followed by secondary, etc.

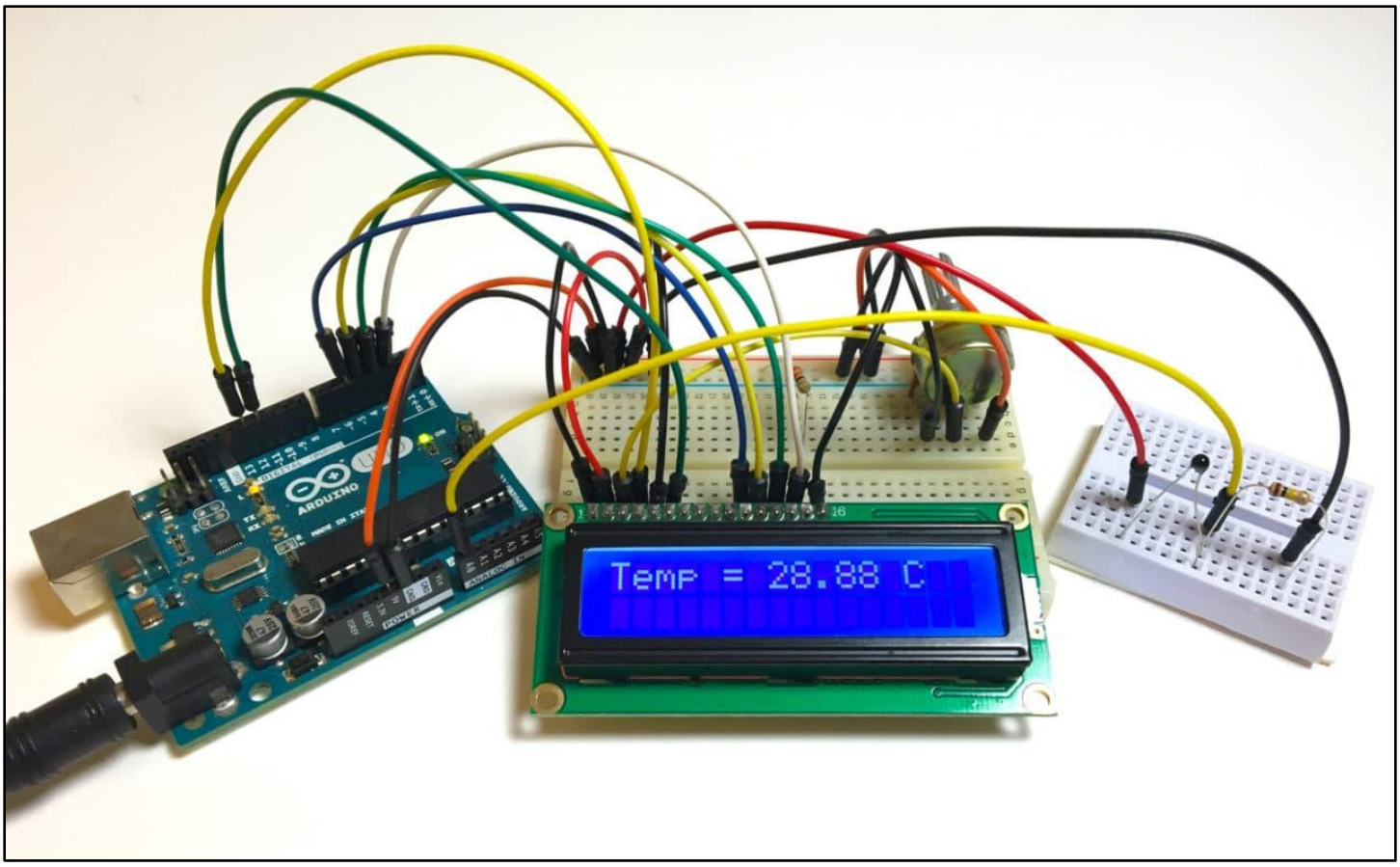
5**. Communication** is key, how to communicate with someone most effectively is the hard part. It takes a combination of patience, open mindedness, and empathy to be both a good talker and active listener which combined makes effective communication. When dedicated and responsible team members responsibly communicate with one another, nothing will stop them when achieving success as they are all working towards a common goal in mind as a team in unity through the power of strong communication.

6. To ensure that all components of the project will function reliably as anticipated, a thorough test must be done prior to the deadline. This testing should include testing each component by component with clear and organized coding with explanatory comments to briefly explain the functionality of the current code line. This would alleviate future problems by making errors easier to pinpoint when having to navigate and revise a well-structured code.

By stating and identifying all potential problems and outcomes, corresponding solutions for each specified problem must also be addressed and implemented. The assigned objectives or tasks to be accomplished will satisfy all customer requirements, thus ensuring a properly functioning payload device, just as expected.

7. A couple of additional, adventurous tasks could be considered. One idea is instead of focusing on offensive strategies, consider focusing on defensive strategies to inhibit any potential competition by blocking progress or creating challenges for surrounding competition.

Another additional task to take into consideration could be to complete the assigned task in the dark and implement the use of a photoelectric or stroboscopic tachometer to coordinate potential designated landing targets. Or to elevate the water sample collection site to make it slightly more challenging considering changes in elevation.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