**Milestone Three: Algorithms and Data Structure**

The artifact I am using for this module is an application I created called Pro Gravity Sensor app, which is designed and developed for Android smartphones. This was also a project assignment of CS 360 course that was created in April 2025. The gravity sensor app is a simple android application that allows the use of the android device’s gravity sensor. Its primary function is to identify the direction of gravity and use a revolving arrow to visually represent that direction. The arrow turns to point toward gravity as the user moves or changes the gravity values, and the screen updates to show the current gravity direction values. The application was created in Java utilizing tools like SensorManager and ConstraintLayout and developed in Android Studio.

**Inclusion of the Artifact**

I selected this artifact because this was one of the most interesting and educational projects I developed. It increased my knowledge of mobile development and helped me learn how things operate with mobile sensors. This application shows my practical knowledge of algorithms and data handling by displaying my abilities to manage real time input from hardware sensors and apply mathematical functions to control UI behavior.

During the enhancement process, I focused on:

* Proper use of android tools was done, like the emulator’s sensor control and Constraint layout tools.
* Effective input validation was done by ensuring only valid sensor inputs impacted the user interface.
* Error handling was done by adding checks for null sensors and proper activity lifecycle handling.
* Database Optimization.

**Reflection**

I learned a lot about how mobile applications work with hardware elements like sensors while developing and improving the gravity sensor app. I enhanced my knowledge of Android studio, activity lifecycle management, and real time input using UI updates. My knowledge of how to handle sensor data more effectively and ensure that the app reacts appropriately to user actions or data changes is better because of improving the app. There were some challenges that I faced while developing this app. Some of them are:

* Generating the desired results from the gravity sensor.
* The program started with several problems and occasionally did not work as planned. For example, the sensor data frequently changed incorrectly, and the arrow sometimes failed to turn. Correcting these little errors took time.
* I had to make some corrections, test the program carefully, and gradually modify my code.

Although it took some time, fixing these problems improved my debugging and problem-solving abilities.