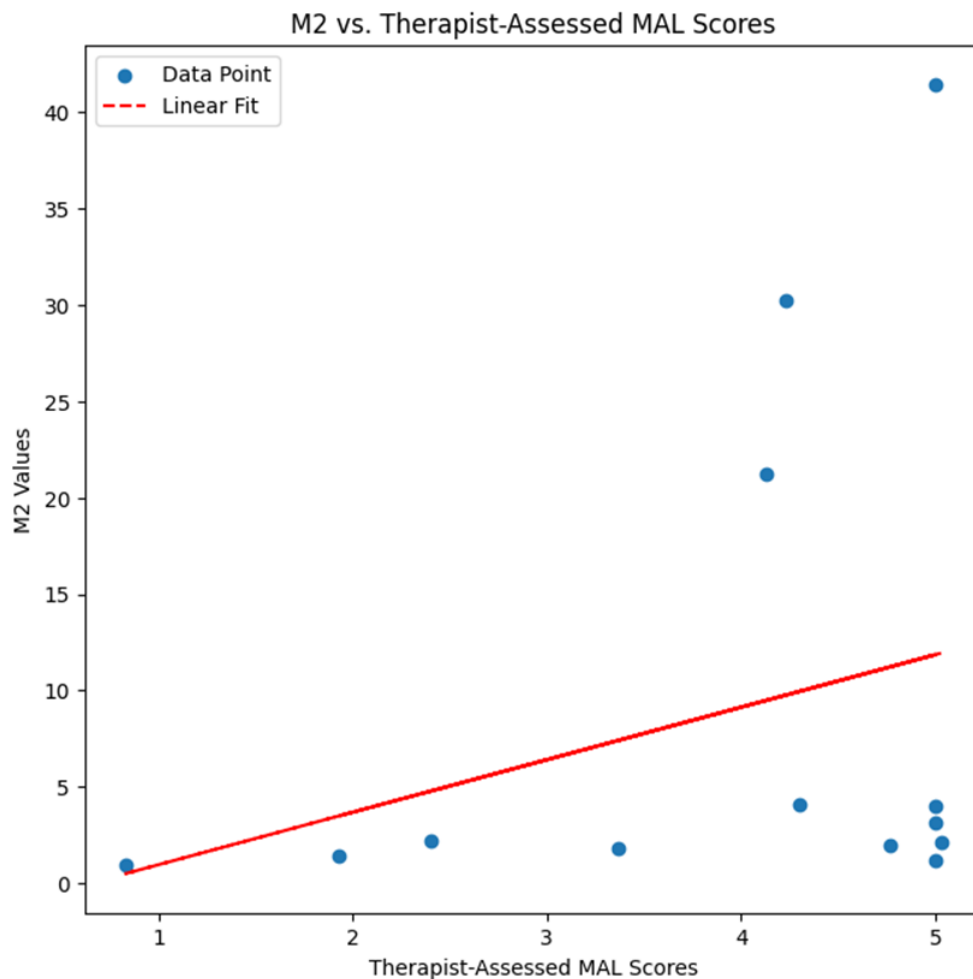


## ASSIGNMENT - 2 - REPORT

### A. Scatter plot

The scatter plot shows the relationship between the therapist-assessed Motor Activity Log (MAL) scores and the calculated M2 values. It provides a way to visually check the correlation between these variables, which was used to identify a linear relationship. The fitted line on the scatter plot highlights the trend in the data and helps assess whether there is a meaningful connection between the MAL and M2 values. This line acts as a basic confirmation that the collected data aligns with the expected relationship, suggesting that the model is functioning as intended.



## **B. Pros and Cons of M2 Compared to conventional approaches-**

***Pros of M2:*** There are many pros for using M2 scores, such as using M2 scores means that we are using an accelerometer for the patients, which ensures that we get continuous data, as the stroke survivors will keep wearing the device for a major part of their day. Another advantage of M2 scores is that the scores capture both gross motor movements as well as fine motor movements. It shows variability in the type of activity data collected, as in real life the activities are of varied intensity and nature. One other advantage of using M2 data is that it is objective. The accelerometer-based measures are machine generated and not human reported which could be subjective in nature like Motor Activity Log (MAL) scores (Kim et al., 2019).

***Cons of M2:*** There are a few cons to using M2 scores. One major limitation is the technical complexity involved in implementing and analyzing accelerometer data. This requires specialized expertise and resources, which may not be readily available in many clinical settings. Another drawback is the challenge of interpreting the vast amount of data generated by accelerometers. Without appropriate tools and algorithms, it can be difficult to process and extract meaningful insights from the data. Other than those, the initial setup of the accelerometer system can be time-consuming as well. Ensuring that patients use the device correctly may require additional training and oversight, which can add to the overall complexity of using this approach (Kim et al., 2019).

***Pros of Conventional approaches (FMA and MAL):*** Conventional methods like the Fugl-Meyer Assessment (FMA) and the Motor Activity Log (MAL) offer several advantages. One key benefit is their established validity; these tools are well-validated and widely used in clinical practice, providing reliable and trusted measures of motor function. Another advantage is their ease of use. These methods are straightforward to administer and do not rely on advanced technology, making them accessible in a wide range of clinical settings. Both the FMA and MAL follow standardized protocols, which ensure consistency in assessments across different patients and clinical environments (Fugl-Meyer et al., 1975; Taub et al., 2011).

***Cons of Conventional approaches (FMA and MAL):*** Conventional approaches like the MAL and FMA have a few limitations. One drawback is the subjectivity involved in self-reported measures like the MAL, which can be influenced by a patient's perception or memory, potentially leading to less accurate data. Another limitation is their narrow scope, as these methods may not capture the full range of daily activities and movements, particularly fine-hand movements, making them less comprehensive. Along with these cons, conventional methods often provide only a snapshot of motor function at a specific point in time, lacking the ability to continuously monitor a patient's progress or daily activity patterns, unlike M2 scores derived from the accelerometer data, which gives continuous data (Kim et al., 2019; Taub et al., 2011).

### **C. Scenarios where we can use Conventional approaches and M2 scores -**

Conventional approaches like the FMA and the MAL are particularly useful for clinical assessments. These methods are ideal for initial evaluations and periodic follow-ups during therapy sessions, providing a standardized framework to measure motor function and monitor progress over time. Along with that, in resource-limited settings where advanced technology is unavailable, these approaches serve as practical and reliable tools for assessing motor function, ensuring that effective evaluations can be conducted even without the need for sophisticated equipment (Fugl- Meyer et al., 1975; Taub et al., 2011).

So overall, the scenarios where we can use conventional approaches and using these would be advantageous are in clinical assessments and in resource-limited settings.

The scenarios in which using M2 scores (Accelerometer based scores) will be valuable when we are monitoring the subjects when they are placed in a home setting, where the researchers are not monitoring the subjects in settings where they are performing their daily activities and motor functions. In research settings, M2 scores are more viable as they depict accurate activity log and can be used to study the effectiveness of different rehabilitation interventions, they are also used to deliver personalized feedback to the stroke survivors about their progress based on their M2 scores (Kim et al., 2019).

So overall, the scenarios where we can use M2 scores are in home monitoring or when we need to deliver personalized feedback or in research setting where we need the exact data.

## References

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