

# MAST679 Assignment 4

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October 2022

## Result and model limitations

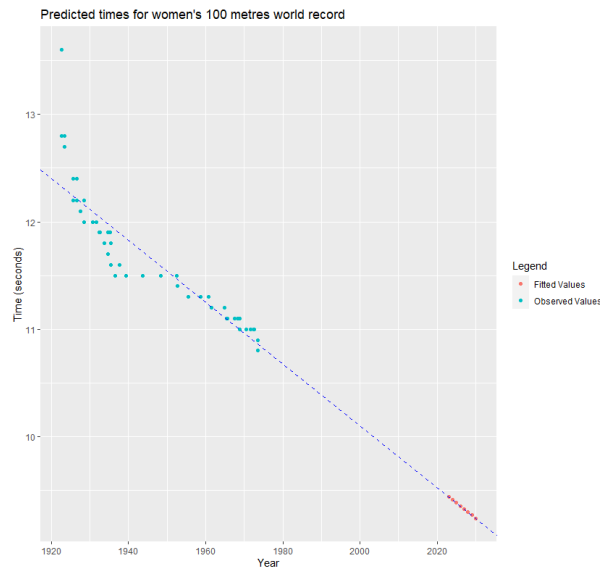


Figure 1: Result of the linear model. The blue dashed line represents the line of best fit.

The model is absurd since  $\lim_{x \rightarrow \infty} \mathbf{E}[Y|X = x] = -\infty$  despite the fact that  $Y > 0$ . In other words, linearity implies continuous improvement whereas common sense points towards a positive asymptotic value for  $\mathbf{E}[Y|X = x]$  as  $x \rightarrow \infty$ .

Another issue is that there is a huge gap between the values used to fit the model, and the values of  $x$  used to compute  $\mathbf{E}[Y|X = x]$ . I am certain that the year-over-year improvements have steadily diminished between 1973 and 2023. Appending the missing data to the wikipedia table and using an autoregressive model would surely produce a better model as far as plausible predictions go.