DTC STEP 2.

Group 5
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FORECASTING ENVIRONMENT

- Follows a fixed sampling scheme
- Data is divided into two distinct parts: an estimation sample and a prediction sample
- Selecting and estimating multiple models
- One-step ahead forecast
- Simpler moving average forecast
- Combined forecast
- Evaluated the models

		AR3	MA	ARMA(1,1)	ARMA(1,3)	Last 4 obsv avg.
MSE		4,984,360,539.00	9,129,197,056.00	8,825,961,063.00	6,668,862,839.00	14,377,427,203.00
MAE		57,968.70	78,547.30	82,558.79	67,881.60	91,773.37
MPE						
	Coefficient	-2746	-56088	-51762	-42380	2839
	P-Value	0.89	0.021	0.03	0.0474	0.933
IE Test						
	R^2	0.07927	0.0005126	0.1037	0.1216	0.4895
	Coefficient	0.3136	0.024130	0.483900	0.401300	-4.344
	P-Value	0.3295	0.9388	0.2615	0.2218	0.00535

FORECAST EVALUATION

- Forecast performance of each model. The MSE is calculated by taking the average of the squared forecast errors. The model with the lowest MSE is considered the optimal forecast.

- MSE: AR(3) lowest, ARMA(1,3) second lowest, and simpler moving average has the highest value

FORECAST OPTIMALITY TESTS

- Assess the accuracy and efficiency of the forecasts generated by each model. A desirable model has an MPE value as close to zero as possible.

- MPE: All models statistically significant except AR(3) and simpler moving average

FORECAST OPTIMALITY TESTS

- Checks if the forecast errors are correlated with past forecasted values

- Informational efficiency test: simpler moving average has the highest R^2, second highest is the ARMA(1,3) model

- Only the simpler moving average model is statistically significant

UNCONDITIONAL PREDICTABILITY TEST

- Average absolute difference between the predicted values and the actual values. Lower value is more desirable.

- MAE: (AR(3) lowest, ARMA(1,3) second lowest, and simpler moving average has the highest value

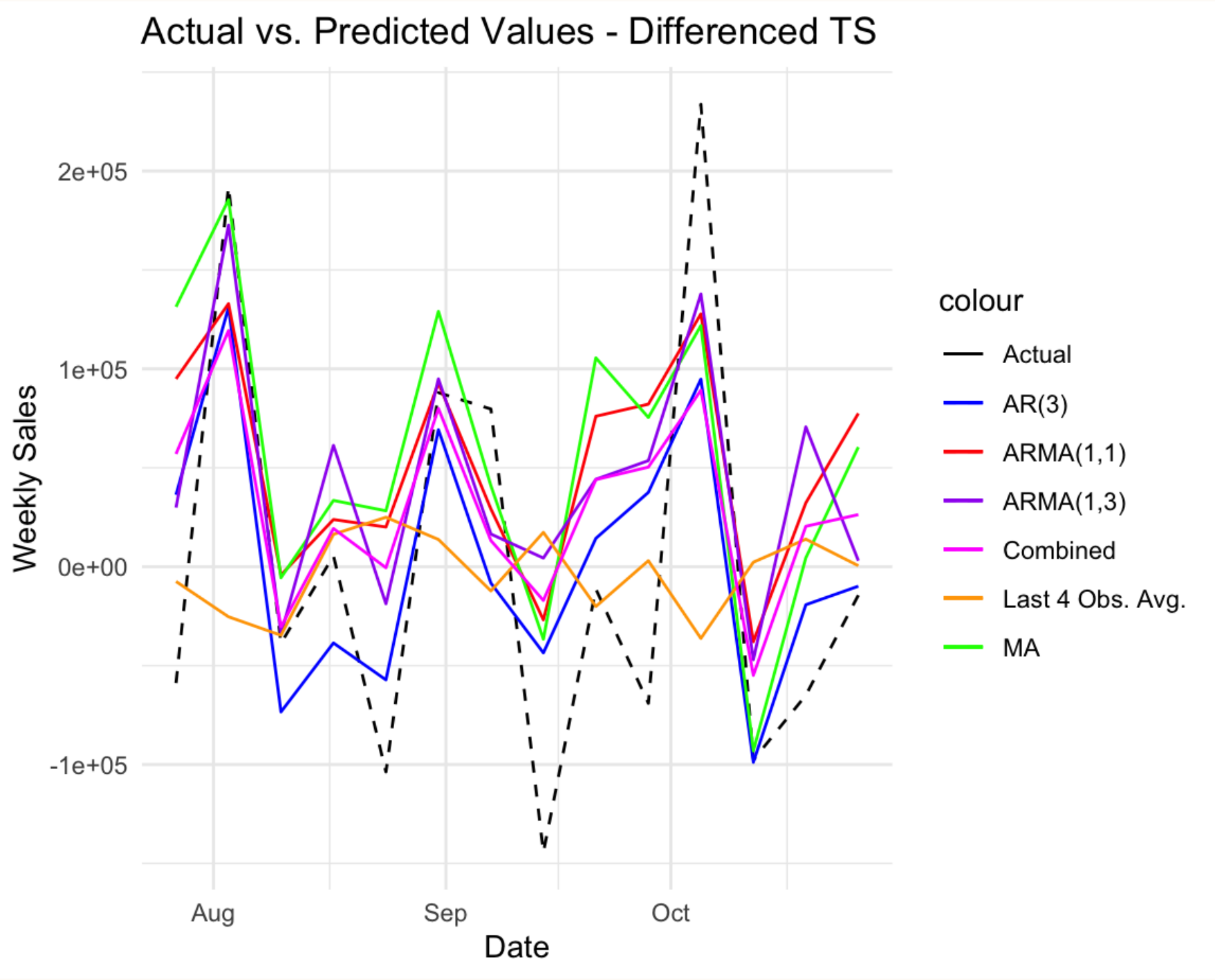
MODELS TO BE DISCARDED

- MA(1), ARMA(1,1), simpler moving average to be discarded
- Out of the ARMA models, MA(1) and ARMA(1,1) have the highest MSE and MAE
- The simpler moving average forecast consistently shows higher values of MSE and MAE compared to the AR(3) and ARMA(1,3) models

COMBINED FORECAST

		Combined Model	AR(3)	ARMA(1,3)	
MSE		7091782295	4984360539	6668862839	

AR(3) has the lowest MSE


Actual vs. Predicted Values - Differenced TS
Weekly Sales
2e+05
1e+05
0e+00
-1e+05
Aug
Sep
Oct
Date
colour
Actual
AR(3)
ARMA(1,1)
ARMA(1,3)
Combined
Last 4 Obs. Avg.
MA

NEXT STEPS

- Concerns regarding our high MSE values across all models
- Do we combine all of our models into our combined forecast or just the optimal ARMA models and simpler moving average model
- The process of OLS weighted combination scheme. If all models have the same weight or if we calculate them.
- Integrate into step 1 into step 2.