# Chapter 5

tourism contains quarterly visitor nights (in thousands) from 1998 to 2017 for 76 regions of Australia.

## Extract data from the Gold Coast region using filter() and aggregate total overnight trips (sum over Purpose) using summarise(). Call this new dataset gc\_tourism.

gc\_tourism <- tourism %>%

filter(Region == "Gold Coast") %>%

summarise(Total\_Trips = sum(Trips))

gc\_tourism

## Using slice() or filter(), create three training sets for this data excluding the last 1, 2 and 3 years. For example, gc\_train\_1 <- gc\_tourism |> slice(1:(n()-4)).

gc\_train\_1 <- gc\_tourism %>% slice(1:(n() - 4))

gc\_train\_2 <- gc\_tourism %>% slice(1:(n() - 6))

gc\_train\_3 <- gc\_tourism %>% slice(1:(n() - 8))

## Compute one year of forecasts for each training set using the seasonal naïve (SNAIVE()) method. Call these gc\_fc\_1, gc\_fc\_2 and gc\_fc\_3, respectively.

forecast\_1\_year <- function(train\_df) {

return(train\_df %>%

model(Snaive = SNAIVE(Total\_Trips))%>%

forecast(h = "1 year"))

}

gc\_fc\_1 <- forecast\_1\_year(gc\_train\_1)

gc\_fc\_2 <- forecast\_1\_year(gc\_train\_2)

gc\_fc\_3 <- forecast\_1\_year(gc\_train\_3)

## Use accuracy() to compare the test set forecast accuracy using MAPE. Comment on these.

> gc\_fc\_1 %>% accuracy(gc\_tourism)

# A tibble: 1 × 10

.model .type ME RMSE MAE MPE MAPE MASE RMSSE ACF1

<chr> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>

1 Snaive Test 75.1 167. 154. 6.36 15.1 2.66 2.36 -0.410

gc\_fc\_1 shows poor performance, with high error and residual structure, suggesting a mismatch between model assumptions and data (MAPE > 15%).

> gc\_fc\_2 %>% accuracy(gc\_tourism)

# A tibble: 1 × 10

.model .type ME RMSE MAE MPE MAPE MASE RMSSE ACF1

<chr> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>

1 Snaive Test 65.1 111. 87.4 5.74 8.36 1.50 1.56 -0.0836

gc\_fc\_2 is acceptable but underperforms relative to gc\_fc\_3 (MAPE is still high, close to 10%).

> gc\_fc\_3 %>% accuracy(gc\_tourism)

# A tibble: 1 × 10

.model .type ME RMSE MAE MPE MAPE MASE RMSSE ACF1

<chr> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>

1 Snaive Test 12.0 43.1 39.5 1.14 4.32 0.670 0.599 -0.792

gc\_fc\_3 is clearly the best seasonal naïve model among the three, with significantly lower forecast errors and better benchmark-relative metrics (MAPE = 4.32).