

**STATS 326**  
**Applied Time Series**  
**ASSIGNMENT ONE**  
**ANSWER GUIDE**

**Question One:** Cycles

**Question Two:** Stationary

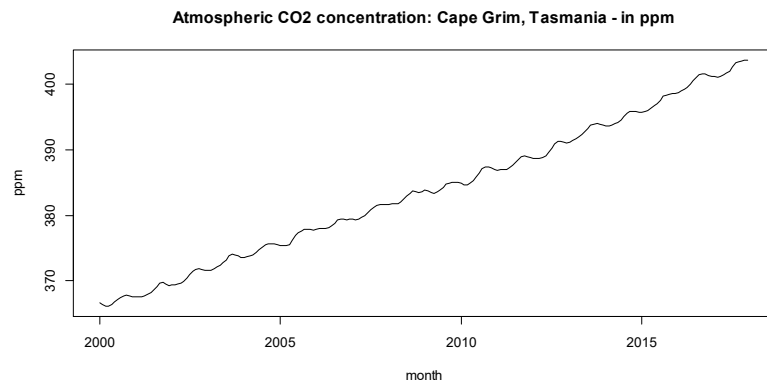
**Question Three:** Seasonal Component (no Trend or Cycle)

**Question Four:** Reasonably Linear Trend & Seasonal Component

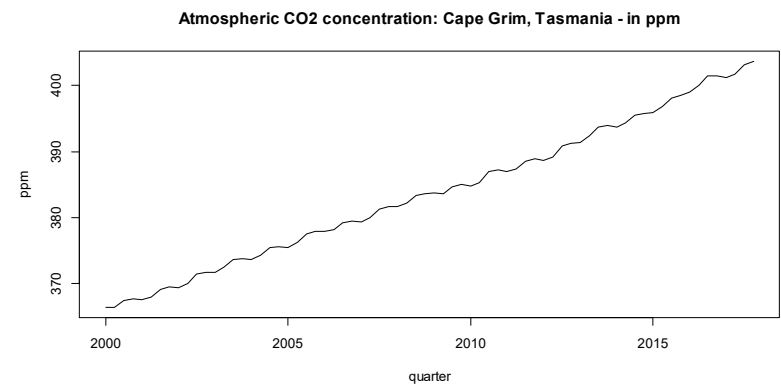
Each of the first 4 questions are worth 20 marks each. Check the marksheet attached to your assignment.

**Question 5:** Cape Grim Atmospheric CO2 Data

```
> plot(Cape.Grim.ts,main="Atmospheric CO2 concentration: Cape Grim,  
Tasmania - in ppm",xlab="month",ylab="ppm")
```



```
> cape.grim.ts = aggregate(Cape.Grim.ts,nfrequency=4)  
> cape.grim.ts  
      Qtr1      Qtr2      Qtr3      Qtr4  
2000 1099.158 1099.210 1102.262 1103.093  
.....  
2017 1203.571 1205.315 1209.440 1211.077  
  
> cape.grim.ts = cape.grim.ts/3  
> cape.grim.ts  
      Qtr1      Qtr2      Qtr3      Qtr4  
2000 366.3860 366.4033 367.4207 367.6977  
.....  
2017 401.1903 401.7717 403.1467 403.6923  
  
> plot(cape.grim.ts,main="Atmospheric CO2 concentration: Cape Grim,  
Tasmania - in ppm",xlab="quarter",ylab="ppm")
```



The series appears to have a reasonably linear trend although there may be a break in the trend around the middle of 2011.

There appears to be a seasonal pattern with quarter 1 being the lowest quarterly value and quarter 3 being the highest quarterly value once you allow for the trend, on average.

The range of the CO2 concentration in the atmosphere, is between 366.386 and 403.6923 parts per million.