**Instructions:**  
Submission should be in R and word file only.

**Question 1)**

A real estate analyst wishes to explore the relationship between the size of a house (in square feet) and its selling price (in thousands of dollars). The analyst collected data from 10 recently sold houses as shown below.

| **House ID** | **Size (sq ft)** | **Price ($k)** |
| --- | --- | --- |
| 1 | 1400 | 280 |
| 2 | 1600 | 320 |
| 3 | 1700 | 340 |
| 4 | 1800 | 360 |
| 5 | 2000 | 400 |
| 6 | 2200 | 420 |
| 7 | 2400 | 450 |
| 8 | 2600 | 480 |
| 9 | 2800 | 520 |
| 10 | 3000 | 550 |

1. Fit a simple linear regression model to predict the house price based on its size using R.
2. Provide the model summary and interpret the coefficients (slope and intercept).
3. Calculate the prediction interval for a house of 2500 sq ft. **(30Marks)**

**Question 2:**

A retail store has recorded its monthly sales (in units) for the past 24 months. The sales data appears to follow a linear upward trend. The dataset is given below:

| **Month** | **Sales** |
| --- | --- |
| 1 | 200 |
| 2 | 210 |
| 3 | 215 |
| 4 | 225 |
| 5 | 230 |
| 6 | 240 |
| 7 | 245 |
| 8 | 255 |
| 9 | 260 |
| 10 | 270 |
| 11 | 275 |
| 12 | 285 |
| 13 | 290 |
| 14 | 300 |
| 15 | 310 |
| 16 | 320 |
| 17 | 330 |
| 18 | 335 |
| 19 | 345 |
| 20 | 350 |
| 21 | 360 |
| 22 | 365 |
| 23 | 375 |
| 24 | 380 |

1. Create a time series object from the data and plot it.
2. Fit a linear trend model (using linear regression) to the data.
3. Provide a model summary and interpret the trend parameter.
4. Forecast the sales for the next 6 months (months 25 to 30) **.(40 Marks)**