Practical 2

AutoRegressive

Forecasting Stock Prices

An investor is interested in forecasting future sales based on historical sales data. The investor believes that recent sales data can be used to predict future sales using autoregressive models.

Dataset

We have the annual sales data from 2001 to 2023.

| Years | Sales |
| --- | --- |
| 2001 | 2130 |
| 2002 | 7582 |
| 2003 | 2960 |
| 2004 | 9347 |
| 2005 | 3943 |
| 2006 | 7338 |
| 2007 | 7704 |
| 2008 | 3231 |
| 2009 | 7993 |
| 2010 | 3017 |
| 2011 | 4303 |
| 2012 | 3460 |
| 2013 | 2126 |
| 2014 | 8298 |
| 2015 | 7257 |
| 2016 | 5848 |
| 2017 | 8320 |
| 2018 | 7735 |
| 2019 | 4010 |
| 2020 | 9977 |
| 2021 | 6934 |
| 2022 | 3536 |
| 2023 | 2773 |

Example 2:

An economist studying the monthly average temperature of a city over several years want to create a model to predict future temperatures based on past data. Using an Autoregressive (AR) model, specifically AR(1) and AR(2), to achieve this.

Dataset

|  | x |
| --- | --- |
| 1 | 20.67961519 |
| 2 | 20.65293922 |
| 3 | 20.18923375 |
| 4 | 20.86448871 |
| 5 | 20.67913765 |
| 6 | 20.99650512 |
| 7 | 21.47251432 |
| 8 | 20.89406671 |
| 9 | 23.16363374 |
| 10 | 24.21791674 |