**Midterm**

**Case 2**

Monthly electronics and appliances stores data is available on [www.census.gov](http://www.census.gov/). Follow the stepped described below to get data into Python:

**Step 1:** Open the following website:

https://www.census.gov/econ/currentdata/

Then select **Advance Monthly Sales for Retail and Food Services** and press **Submit**

**Step 2:** Make the following selection

**1.** **Advance Monthly Sales for Retail and Food Services**

**2.** Start **= 1992,** End **= 2022**

**3.** **443 Electronics and Appliances Stores**

**4.** Sales **– Monthly**

**5.** U.S. **Total**

Check the box for **only** for **Not Seasonally adjusted**, i.e. include only non-seasonally adjusted.

**Step 3:** click on **GET DATA**

**Step 4:** scrape the data from the website and load it into Python.

* Plot the data and describe the patterns you see in the graph.
* To estimate covid impact on sales during **03/2020**, **04/2020** and **05/2020** you decided to use either a regression model or a smoothing model – whichever gives the smallest testing average MAPE based in the following scenarios :

**Scenario 1:**

Training set: start = 01/1992, end=12/2016

Testing set: start = 01/2017, end=12/2017

**Scenario 2:**

Training set: start = 01/1992, end=12/2017

Testing set: start = 01/2018, end=12/2018

**Scenario 3:**

Training set: start = 01/1992, end=12/2018

Testing set: start = 01/2019, end=12/2019

One scenario and one model(method, for smoothing) is sufficient

Report covid impact in both millions of dollars and percentages.

* Using both – regression and smoothing - models predict the next 12 values.

One model(method) is sufficient

* Plot historical data, fitted values and future forecasts.
* Do you consider that your modeling approach presents an accurate picture of current and future data patterns?