**Results**

**1.Random Split**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **All Categories** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 1710.57 | 2926047.22 | 0.90 | 0.92 | 4469.57 |
| XGBoost | 1550.06 | 2402688.52 | 0.92 | 0.93 | 3882.93 |
| Neural Network | 827.43 | 684641.20 | 0.98 | 0.98 | 1552.34 |

Best Parameters:

* Random Forest:

{'criterion': 'friedman\_mse',

'max\_depth': 10,

'max\_features': 'sqrt',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'squared\_error',

'loss': 'squared\_error',

'max\_depth': 5,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* Neural Network:

{'activation': 'identity', 'solver': 'lbfgs'}

**2.Summer Period**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **All Categories – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 699.14 | 488800.48 | 0.40 | 0.53 | 950.69 |
| XGBoost | 594.42 | 353333.23 | 0.57 | 0.61 | 811.06 |
| Neural Network | 452.28 | 204555.26 | 0.75 | 0.79 | 830.28 |

Best Parameters:

* Random Forest:

{'criterion': 'poisson',

'max\_depth': 10,

'max\_features': 'sqrt',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'friedman\_mse',

'loss': 'squared\_error',

'max\_depth': 5,

'max\_features': 'log2',

'min\_samples\_leaf': 2}

* Neural Network:

{'activation': 'identity', 'solver': 'lbfgs'}

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| **Dermafiller – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 27.96 | 781.67 | 0.77 | 0.77 | 49.17 |
| XGBoost | 42.16 | 1777.74 | 0.48 | 0.49 | 70.54 |
| Neural Network | 53.79 | 2893.14 | 0.16 | 0.20 | 84.72 |

Best Parameters:

* Random Forest:

{'criterion': 'friedman\_mse',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'friedman\_mse',

'loss': 'squared\_error',

'max\_depth': 5,

'max\_features': 'sqrt',

'min\_samples\_leaf': 2}

* Neural Network:

{'activation': 'identity', 'solver': 'lbfgs'}

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| --- | --- | --- | --- | --- | --- |
| **Mesotherapy – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 1.67 | 2.79 | -0.28 | -0.25 | 2.48 |
| XGBoost | 2.21 | 4.88 | -1.23 | -1.20 | 3.17 |
| Neural Network | 3.14 | 9.83 | -3.49 | -1.57 | 6.14 |

Best Parameters:

* Random Forest:

{'criterion': 'squared\_error',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'friedman\_mse',

'loss': 'squared\_error',

'max\_depth': 10,

'max\_features': 'sqrt',

'min\_samples\_leaf': 1}

* Neural Network:

{'activation': 'logistic', 'solver': 'lbfgs'}

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| **Needles – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 2.00 | 3.99 | 0.72 | 0.86 | 3.41 |
| XGBoost | 1.98 | 3.93 | 0.72 | 0.83 | 3.51 |
| Neural Network | 4.80 | 23.05 | -0.62 | 0.66 | 6.71 |

Best Parameters:

* Random Forest:

{'criterion': 'friedman\_mse',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'friedman\_mse',

'loss': 'squared\_error',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* Neural Network:

{'activation': 'tanh', 'solver': 'adam'}

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| **Profilho – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 517.28 | 267576.27 | 0.59 | 0.77 | 741.03 |
| XGBoost | 423.05 | 178973.35 | 0.73 | 0.75 | 565.15 |
| Neural Network | 318.10 | 101185.83 | 0.84 | 0.86 | 610.61 |

Best Parameters:

* Random Forest:

{'criterion': 'poisson',

'max\_depth': 5,

'max\_features': 'sqrt',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'squared\_error',

'loss': 'huber',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* Neural Network:

{'activation': 'identity', 'solver': 'lbfgs'}

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| **Skinbooster – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 33.95 | 1152.39 | 0.50 | 0.53 | 44.26 |
| XGBoost | 36.26 | 1315.07 | 0.43 | 0.46 | 51.16 |
| Neural Network | 58.23 | 3391.10 | -0.48 | 0.54 | 82.92 |

Best Parameters:

* Random Forest:

{'criterion': 'friedman\_mse',

'max\_depth': 5,

'max\_features': 'sqrt',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'friedman\_mse',

'loss': 'squared\_error',

'max\_depth': 10,

'max\_features': 'sqrt',

'min\_samples\_leaf': 2}

* Neural Network:

{'activation': 'identity', 'solver': 'adam'}

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| **Skincare – Summer** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest | 51.55 | 2657.21 | 0.09 | 0.85 | 73.15 |
| XGBoost | 76.29 | 5819.75 | -1.00 | 0.86 | 99.33 |
| Neural Network | 33.99 | 1155.26 | 0.60 | 0.74 | 57.96 |

Best Parameters:

* Random Forest:

{'criterion': 'poisson',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 1}

* XGBoost:

{'criterion': 'friedman\_mse',

'loss': 'quantile',

'max\_depth': 10,

'max\_features': 'log2',

'min\_samples\_leaf': 2}

* Neural Network:

{'activation': 'identity', 'solver': 'adam'}

**3.Winter Period**

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| **All Categories – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| **Dermafiller – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Mesotherapy – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Needles – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Profilho – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Skinbooster – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Skincare – Winter** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

**4.Whole Year Period**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **All Categories – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Dermafiller – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mesotherapy – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Needles – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Profilho – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skinbooster – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skincare – Whole Year** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:

Neural Network:

**5.Covid Period**

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| --- | --- | --- | --- | --- | --- |
| **All Categories – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dermafiller – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mesotherapy – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Needles – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Profilho – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Skinbooster – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

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| --- | --- | --- | --- | --- | --- |
| **Skincare – Covid** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

**6.Last 14 Months Period**

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| --- | --- | --- | --- | --- | --- |
| **All Categories – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dermafiller – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mesotherapy – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Needles – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Profilho – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skinbooster – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skincare – Last 14 Months** | | | | | |
| **Algorithm** | **RMSE** | **MSE** | **R^2** | **Explained Variance** | **Max Error** |
| Random Forest |  |  |  |  |  |
| XGBoost |  |  |  |  |  |
| Neural Network |  |  |  |  |  |

Best Parameters:

* Random Forest:
* XGBoost:
* Neural Network: