Report on Electricity Price Prediction Analysis

1. Introduction

The purpose of this report is to analyze and predict electricity prices using machine learning techniques. The accurate forecasting of electricity prices is vital for utility companies, traders, and consumers to manage costs efficiently and make informed decisions.

2. Dataset Description

The dataset utilized for the analysis contains information crucial for electricity price prediction, encompassing system loads, weather variables, fuel costs, reserve margin, and details about scheduled maintenance and forced outages. It has undergone preprocessing to remove non-numeric columns.

Python code:

```
# Loading and Preprocessing the Dataset

import pandas as pd

from sklearn.model_selection import train_test_split

data = pd.read_csv('electricity_data.csv')

data = data.select_dtypes(exclude=['object'])  # Selecting only numeric columns

features = data.drop('Electricity_Price', axis=1)  # Excluding the target variable

target = data['Electricity_Price']

X_train, X_test, y_train, y_test = train_test_split(features, target, test_size=0.2, random_state=42)
```

3. Approach

The methodology follows a supervised learning approach using the RandomForestRegressor model for predicting electricity prices. This model is selected due to its capability to handle complex relationships and non-linearities in the data.

Python code:

```
from sklearn.ensemble import RandomForestRegressor

from sklearn.metrics import mean_squared_error

model = RandomForestRegressor()

model.fit(X_train, y_train)

y_pred = model.predict(X_test)

mse = mean_squared_error(y_test, y_pred)
```

4. Model Training and Evaluation

The model is trained on the training set and evaluated using the Mean Squared Error (MSE), a common metric to gauge the model's performance in regression tasks.

Python code:

```
# Model Training and Evaluation

mse = mean_squared_error(y_test, y_pred)

print(f"Mean Squared Error: {mse}")
```

5. Analysis and Results

The model's predictions are adjusted using the obtained Mean Squared Error (MSE), although it is noted that direct adjustment by MSE might not be appropriate in practical applications due to potential overfitting.

Python code:

```
adjusted_predicted_prices = y_pred + mse

print("Adjusted Predicted Electricity Prices:", adjusted_predicted_prices)
```

6. Visualization

For visual representation, a line plot is created to display the Adjusted Predicted Electricity Prices derived from the model.

Python code:

```
import matplotlib.pyplot as plt

plt.figure(figsize=(8, 6))

plt.plot(adjusted_predicted_prices, label='Adjusted Predicted Prices')

plt.title('Adjusted Predicted Electricity Prices')

plt.xlabel('Data Points')

plt.ylabel('Adjusted Predicted Prices')

plt.legend()

plt.show()
```

7. Conclusion

The analysis has illustrated the use of the RandomForestRegressor model for electricity price prediction. However, the direct adjustment by MSE for predicted prices might not be suitable in real-world scenarios and demands further refinement and exploration.

The program code:

electricity_data.csv

Date	Electricity_Price	System_Loads	Weather_Variables	Fuel_Costs	Reserve_Margin	Scheduled_Maintenance	Forced_Outages
########	49.96321	934	0.091002	39.25933	24	0	1
########	96.05714	676	0.726397	93.04006	10	0	0
########	78.55952	516	0.547446	78.38553	16	1	0
########	67.89268	267	0.45091	77.82287	-45	1	1

##### ###	32.48149	941	0.910471	87.58 087	-42	0	0
##### ###	32.47956	142	0.297959	67.07 632	-45	1	0
##### ###	24.64669	655	0.523602	87.05 381	22	0	0
##### ###	89.29409	384	0.697642	64.86 635	44	0	0
##### ###	68.0892	496	0.796472	34.70 228	-19	0	0
##### ###	76.64581	111	0.459347	58.36 737	-10	1	0
##### ###	21.64676	706	0.842091	64.82 254	25	1	0
##### ###	97.59279	401	0.768918	80.41 418	-43	0	0
##### ###	86.59541	997	0.066236	37.46 051	21	0	1
##### ###	36.98713	352	0.045861	39.80 13	-1	0	1
##### ###	34.546	598	0.620806	48.45 787	41	0	1
##### ###	34.67236	853	0.347413	48.65 489	11	0	0
##### ###	44.33938	134	0.209131	81.25 292	33	1	0
##### ###	61.98051	826	0.57965	47.55 115	11	0	1
##### ###	54.5556	948	0.341563	74.31 686	-44	1	1
##### ###	43.29833	189	0.537263	64.59 917	24	0	1
##### ###	68.94823	875	0.460119	70.13 061	33	1	0
##### ###	31.15951	704	0.584766	88.66 749	29	1	1
##### ###	43.37157	701	0.4003	58.30 671	-47	1	1
##### ###	49.30895	517	0.697668	83.96 38	-45	1	0
##### ###	56.4856	214	0.180067	59.54 252	7	1	1
##### ###	82.81408	716	0.696501	54.77 1	-29	1	0
##### ###	35.9739	295	0.411661	97.10 39	-25	0	0
##### ###	61.13876	925	0.874318	42.90 596	-48	1	0
##### ###	67.39317	600	0.515236	36.32 359	-10	0	1

#####				83.96			
###	23.71603	725	0.97311	901	9	1	1
#####				34.77			
###	68.60359	592	0.601935	748	-37	1	0
#####				88.59			
###	33.64193	174	0.223849	553	24	0	1
#####				60.60			
###	25.20413	512	0.821791	354	31	1	1
#####				94.08			
###	95.91084	475	0.345083	596	-39	0	1
#####				80.50			
###	97.25056	519	0.347619	73	36	0	1
#####				72.72			
###	84.67179	828	0.031805	833	-39	0	0
#####				96.45			
###	44.3691	376	0.548715	148	-38	0	1
#####				57.76			
###	27.81377	860	0.534424	546	-26	1	0
#####				96.78			
###	74.73864	775	0.355991	609	-6	1	0
#####				39.45			
###	55.2122	493	0.894217	009	-32	0	1
#####				63.86			
###	29.76306	968	0.128748	285	4	1	0
#####				48.89			
###	59.61415	556	0.3301	379	49	1	1
#####				67.78			
###	22.75108	291	0.321583	899	-6	0	1
#####				41.34			
###	92.74563	838	0.092291	097	-43	1	0
#####				88.90			
###	40.7024	788	0.481145	708	42	0	0
#####				89.24			
###	73.00178	198	0.687785	855	2	0	0
#####				96.86			
###	44.93689	647	0.511657	654	4	1	0
#####				40.82			
###	61.60544	195	0.156978	705	-19	1	1
#####				73.63			
###	63.73682	763	0.377286	328	0	1	1
#####				63.19			
###	34.78836	762	0.002595	661	-7	0	1
#####				54.10			
###	97.56677	289	0.868301	686	31	0	0
#####				54.60			
###	82.01063	835	0.084517	781	19	1	0
#####				58.89			
###	95.15992	136	0.597278	555	-33	1	0
#####				79.34			
###	91.58619	879	0.986257	479	32	1	1

##### ###	67.832	468	0.536591	71.88 002	-29	1	0
##### ###	93.74994	794	0.924042	62.17 771	-14	0	1
##### ###	27.0794	624	0.236117	35.31 534	45	1	0
##### ###	35.67863	378	0.759955	35.44 357	5	0	1
##### ###	23.61818	316	0.531266	30.16 376	8	0	1
##### ###	46.02643	966	0.720516	97.73 896	-48	1	0
##### ###	51.09418	972	0.062341	30.36 777	-23	1	0
##### ###	41.70792	897	0.147739	37.21 656	23	1	1
##### ###	86.299	372	0.133117	52.02 176	-16	0	1
##### ###	48.54027	980	0.687166	86.52 012	10	1	0
##### ###	42.47476	161	0.844441	97.34 692	42	1	0
##### ###	63.41569	695	0.749616	85.30 095	3	0	1
##### ###	31.27394	979	0.030472	78.33 922	12	1	0
##### ###	84.17576	828	0.867215	66.49 105	28	0	1
##### ###	25.96405	441	0.354147	36.06 936	46	1	1
##### ###	98.95095	496	0.397164	97.07 196	-44	0	0
##### ###	81.77958	798	0.104869	83.08 747	25	1	0
##### ###	35.89725	118	0.737405	74.72 646	-2	1	0
##### ###	20.44177	276	0.182284	83.13 251	43	0	0
##### ###	85.23691	711	0.563965	80.68 723	34	0	0
##### ###	76.54859	495	0.84071	74.60 621	-20	1	1
##### ###	78.32057	544	0.089204	98.64 038	7	0	1
##### ###	81.70163	332	0.535336	93.23 547	10	0	0
##### ###	25.92357	175	0.233216	75.26 654	-27	0	0
##### ###	48.67726	364	0.342927	78.52 226	-31	0	0

##### ###	29.26952	554	0.47397	33.61 171	-14	1	1
##### ###	89.04827	895	0.355104	76.89 422	-47	1	0
##### ###	69.86385	817	0.648823	33.09 158	41	0	0
##### ###	46.47184	834	0.479582	71.17 846	-31	0	1
##### ###	25.08467	483	0.584199	99.95 474	9	0	1
##### ###	44.87859	663	0.736822	68.90 646	-27	0	0
##### ###	46.01467	950	0.557742	63.12 471	-1	1	0
##### ###	78.36849	605	0.586535	51.89 984	-2	1	0
##### ###	71.0046	466	0.564459	38.43 658	0	0	1
##### ###	90.97702	243	0.378773	81.17 166	45	0	0
##### ###	57.77719	984	0.337447	43.48 193	-15	0	0
##### ###	29.56754	168	0.899647	38.06 974	47	1	0
##### ###	77.05958	198	0.607555	59.52 339	49	0	1
##### ###	80.8628	495	0.244353	85.67 393	15	1	1
##### ###	64.90218	124	0.498248	82.15 452	28	0	0
##### ###	81.67737	990	0.330348	33.84 178	-17	1	0
##### ###	59.50365	568	0.933692	61.86 006	-15	0	1
##### ###	61.81863	583	0.007534	66.57 042	-45	1	1
##### ###	54.20328	664	0.225333	75.11 827	-12	0	1
##### ###	22.03353	250	0.365357	75.51 171	-9	0	1
##### ###	28.63131	243	0.48781	55.52 881	7	0	1
##### ###	22.51433	668	0.850818	69.24 74	-39	1	1
##### ###	70.91283	138	0.087888	63.67 433	-48	0	1
##### ###	45.14848	208	0.805865	91.94 988	-33	1	1
##### ###	60.68566	792	0.055653	67.11 856	-11	1	1

##### ###	92.60532	141	0.842314	60.87 225	-30	0	0
##### ###	39.94338	285	0.051635	58.31 398	-36	0	0
##### ###	52.83063	497	0.018242	70.06 994	46	0	0
##### ###	80.44409	322	0.696961	86.27 839	48	1	1
##### ###	38.30385	733	0.997256	67.68 81	-25	0	0
##### ###	26.15839	232	0.89661	76.31 586	-43	1	1
##### ###	43.18012	262	0.575998	81.64 99	49	1	1
##### ###	32.8977	314	0.917396	66.41 177	43	0	0
##### ###	94.37581	832	0.0053	59.87 719	36	0	1
##### ###	84.64963	334	0.975067	91.36 658	-9	0	0
##### ###	70.6723	942	0.490749	59.22 543	-7	0	0
##### ###	89.71685	757	0.722896	62.33 6	-37	0	0
##### ###	84.29377	850	0.820861	99.32 389	27	0	1
##### ###	34.9256	687	0.718457	30.01 663	-49	1	0
##### ###	91.40472	108	0.535037	42.98 31	-14	1	1
##### ###	63.14738	173	0.476619	56.87 747	18	1	0
##### ###	84.59521	591	0.838583	95.28 129	-13	0	0
##### ###	91.6873	352	0.205078	34.90 208	-10	1	0
##### ###	45.44028	329	0.967994	30.66 398	11	1	1
##### ###	28.80415	618	0.710952	33.68 787	9	1	1
##### ###	38.23481	273	0.199507	36.19 804	-37	1	1
##### ###	54.16862	752	0.736247	32.63 177	38	1	0
##### ###	85.44118	267	0.52984	63.58 469	33	0	0
##### ###	88.85845	269	0.70723	70.65 3	-49	0	1
##### ###	20.55617	492	0.76778	49.01 809	19	1	1

##### ###	60.85978	894	0.08729	57.88 012	-34	1	1
##### ###	53.39288	733	0.506104	36.41 895	38	1	1
##### ###	37.76862	293	0.932014	53.54 593	-23	0	1
##### ###	29.58923	616	0.320642	66.57 634	15	0	1
##### ###	47.00921	128	0.593883	81.25 903	-16	1	0
##### ###	95.43278	264	0.36923	30.23 425	-46	0	1
##### ###	45.85623	521	0.454268	62.71 175	14	0	0
##### ###	61.50325	438	0.548603	50.79 02	-11	1	0
##### ###	76.24152	747	0.548922	89.69 753	25	0	1
##### ###	49.09037	595	0.20173	80.08 873	5	0	1
##### ###	97.74257	464	0.684572	71.23 76	-15	1	0
##### ###	96.99578	932	0.087868	49.40 86	-6	0	1
##### ###	40.14258	441	0.138825	93.72 374	-28	0	1
##### ###	59.77988	599	0.002711	33.15 705	-4	1	0
##### ###	44.07026	756	0.116696	37.66 273	-20	0	0
##### ###	42.78724	610	0.473166	57.41 411	-40	0	0
##### ###	22.95096	426	0.606102	38.71 063	-41	1	1
##### ###	68.76515	316	0.794289	96.94 91	16	1	0
##### ###	60.21432	400	0.106699	85.85 925	-37	1	1
##### ###	24.1183	231	0.850727	48.12 879	29	0	0
##### ###	42.29172	903	0.745975	71.19 88	23	1	0
##### ###	92.66127	169	0.408518	98.76 314	42	0	0
##### ###	39.16495	351	0.932938	91.89 393	-41	1	1
##### ###	31.59159	514	0.990929	72.05 589	25	0	1
##### ###	59.15622	886	0.205002	93.26 068	43	1	0

##### ###	98.85204	544	0.379229	99.24 294	-50	1	0
##### ###	39.36442	975	0.926449	82.03 47	-46	1	0
##### ###	73.77084	281	0.721597	34.54 905	-31	1	1
##### ###	80.92957	266	0.048095	58.11 062	-43	0	0
##### ###	39.011	190	0.781514	88.64 78	-8	1	1
##### ###	78.25731	813	0.827941	46.13 984	25	1	0
##### ###	49.42265	957	0.750502	88.14 498	-50	0	0
##### ###	70.58447	630	0.799537	38.42 371	6	1	0
##### ###	70.68238	138	0.825133	33.28 618	13	0	0
##### ###	62.86197	225	0.186405	56.88 634	33	1	0
##### ###	27.22318	550	0.235692	32.57 124	-23	1	0
##### ###	86.8242	272	0.633759	97.00 892	-14	1	1
##### ###	45.66241	752	0.907866	87.83 44	-4	0	0
##### ###	34.92148	853	0.316197	86.05 388	25	1	1
##### ###	23.26201	319	0.588307	74.08 445	-14	1	0
##### ###	67.27144	737	0.682982	45.14 268	-2	1	0
##### ###	74.20515	157	0.451949	66.27 823	-7	0	1
##### ###	21.32703	759	0.713782	71.80 919	5	0	0
##### ###	60.96744	575	0.899667	66.75 221	-23	1	1
##### ###	38.11966	555	0.624102	48.21 634	28	0	1
##### ###	71.61382	928	0.539781	66.06 735	-45	1	0
##### ###	33.94931	994	0.438745	64.38 304	10	1	1
##### ###	75.27502	460	0.577486	99.74 35	-31	1	1
##### ###	50.93883	100	0.355362	92.82 053	27	1	0
##### ###	94.9384	486	0.391482	62.43 665	-49	1	1

##### ###	31.00168	447	0.531857	73.60 562	22	1	0
##### ###	47.28531	289	0.066619	82.35 101	-14	1	0
##### ###	29.07788	604	0.229025	32.44 056	-31	0	0
##### ###	93.97549	290	0.542849	92.64 45	-25	0	0
##### ###	90.18715	607	0.431528	90.20 888	-22	0	1
##### ###	40.63533	468	0.332816	62.02 025	-50	0	0
##### ###	72.79872	508	0.730549	57.38 188	-16	0	0
##### ###	85.37778	923	0.693718	49.10 716	19	0	1
##### ###	64.41606	216	0.166731	63.36 738	8	0	0
##### ###	62.37205	233	0.878629	33.10 637	18	1	0
##### ###	39.34818	157	0.495424	89.65 355	-18	1	1
##### ###	27.44822	655	0.741461	32.47 957	0	1	1
##### ###	91.77726	784	0.573151	53.03 36	27	1	1
##### ###	92.03344	771	0.997693	95.21 126	-39	0	1
##### ###	70.64812	272	0.752403	81.46 489	-31	0	1
##### ###	47.12238	928	0.70698	49.69 737	2	1	1
##### ###	47.93677	914	0.778572	47.68 544	37	1	1
##### ###	78.07645	248	0.143128	30.35 575	-8	0	0
##### ###	91.76882	179	0.204545	78.7	47	1	1
##### ###	90.96691	985	0.714064	33.41 485	38	1	1
##### ###	82.39004	312	0.493981	67.28 218	-1	1	1
##### ###	71.36253	302	0.754635	97.34 854	-22	1	0
##### ###	26.7312	863	0.102916	37.66 282	6	0	0
##### ###	32.9303	328	0.536481	92.61 36	-12	1	1
##### ###	91.88434	775	0.378822	99.40 327	44	1	1

##### ###	68.51432	326	0.457	34.30 619	5	0	1
##### ###	20.73576	758	0.603958	91.80 344	-8	0	0
##### ###	28.11772	631	0.502288	66.12 553	-1	1	0
##### ###	73.08014	540	0.539861	93.45 596	-28	0	1
##### ###	20.40493	501	0.486357	69.99 233	-7	1	0
##### ###	32.86464	146	0.408955	76.34 784	-13	1	1
##### ###	63.8987	332	0.771882	68.06 452	33	0	0
##### ###	75.35162	404	0.012203	90.51 45	-28	1	0
##### ###	72.1569	625	0.598443	81.37 369	-6	1	1
##### ###	37.94154	242	0.565508	66.48 822	1	1	1
##### ###	76.97434	514	0.716179	90.77 126	29	1	1
##### ###	38.97993	612	0.599029	47.16 999	-1	0	1
##### ###	46.03198	472	0.826799	41.01 385	-43	0	0
##### ###	79.71931	665	0.959075	41.22 801	34	1	0
##### ###	71.97063	985	0.342524	53.38 062	-50	0	0
##### ###	87.93787	358	0.227351	46.70 83	-43	1	1
##### ###	72.60903	755	0.423597	95.10 632	-22	1	0
##### ###	65.46469	570	0.28793	37.40 839	45	1	1
##### ###	27.49398	111	0.61495	78.92 935	-46	1	0
##### ###	49.41726	429	0.911852	43.24 551	35	1	1
##### ###	41.21619	835	0.139116	91.71 46	-4	0	1
##### ###	39.51917	883	0.100795	97.29 207	-17	1	0
##### ###	97.84084	457	0.256016	62.58 29	14	0	1
##### ###	51.44782	507	0.726096	91.53 5	4	0	1
##### ###	91.36372	767	0.592963	30.36 016	39	1	0

##### ###	70.49109	472	0.102213	87.39 628	-8	1	1
##### ###	83.5849	107	0.918751	46.00 376	23	1	1
##### ###	60.21097	221	0.790085	93.60 909	-21	1	1
##### ###	66.15231	447	0.023023	30.07 841	31	1	0
##### ###	59.40142	775	0.651367	68.93 272	-34	0	0
##### ###	35.61944	189	0.771247	82.96 451	-25	1	1
##### ###	77.79617	747	0.374435	48.10 818	-43	1	0
##### ###	42.46179	797	0.068922	43.51 93	-4	0	1
##### ###	21.94528	415	0.077321	35.88 688	25	0	1
##### ###	71.63778	277	0.104247	52.85 035	40	1	1
##### ###	34.16885	639	0.84044	69.18 91	21	0	1
##### ###	95.23669	831	0.910686	38.10 907	38	1	1
##### ###	96.31429	968	0.122811	56.36 868	-5	0	0
##### ###	93.18915	140	0.235906	30.63 507	17	0	1
##### ###	49.6127	839	0.165521	87.30 756	-18	1	0
##### ###	21.23653	803	0.186321	38.99 141	-50	0	0
##### ###	94.26549	601	0.837491	49.83 401	-32	0	1
##### ###	54.25473	244	0.332146	31.28 994	-20	0	1
##### ###	97.33239	300	0.311444	60.25 685	29	0	0
##### ###	97.0896	823	0.227396	88.80 851	-37	0	0
##### ###	88.24076	560	0.607894	57.45 058	2	0	0
##### ###	43.55591	831	0.379306	42.56 481	-3	1	1
##### ###	50.80782	851	0.74425	82.75 892	18	1	0
##### ###	88.09093	657	0.20558	85.21 649	39	0	1
##### ###	45.35376	646	0.78779	42.16 274	11	1	1

########	33.55942	352	0.603722	83.95979	41	1	1
########	64.5441	489	0.114267	96.31085	15	1	0
########	94.89238	693	0.414505	41.64643	13	0	1
########	75.68238	982	0.863518	83.9689	19	1	1
########	65.60489	355	0.92296	79.60004	12	0	1
########	27.77412	808	0.4657	63.15017	22	1	1
########	69.20058	914	0.480837	34.05443	-18	0	1
########	99.20431	549	0.918455	35.22861	-10	0	0
########	31.20672	109	0.587068	89.66903	38	1	1
########	61.46637	923	0.032847	99.31039	-3	1	1
########	90.18985	897	0.912749	77.32366	-38	0	0
########	79.26149	341	0.248226	61.21708	22	1	1
########	75.76126	350	0.577632	75.33016	26	1	0
########	76.19873	976	0.165513	71.60771	-20	1	1
########	48.75929	104	0.033879	56.85286	24	0	0
########	43.48735	218	0.311473	34.59383	17	0	0
########	84.74889	900	0.780496	87.50591	47	1	1
########	84.80907	473	0.277587	56.02835	-47	1	1
########	89.36579	164	0.220097	87.315	-32	1	1
########	93.05924	245	0.212681	47.67561	19	0	0
########	60.90739	323	0.515174	30.07206	47	0	0
########	60.1213	338	0.975541	41.12568	31	1	0
########	83.86361	276	0.458989	62.79776	-38	1	1
########	71.99711	878	0.557305	96.10125	-28	1	0
########	76.15735	952	0.860632	37.15355	32	1	0

#####				89.79			
###	83.66341	381	0.53507	468	24	1	1
#####				66.89			
###	91.20043	162	0.184463	169	-50	1	0
#####				87.81			
###	47.03961	316	0.299596	445	37	0	0
#####				50.88			
###	50.04664	953	0.309937	621	3	1	1
#####				88.79			
###	27.51856	926	0.397318	63	20	0	0
#####				84.09			
###	66.26241	894	0.426789	759	38	1	1
#####				46.10			
###	22.87538	788	0.799782	376	34	1	1
#####				39.19			
###	57.24784	560	0.349387	346	-36	0	1
#####				90.76			
###	63.41157	709	0.468232	38	14	0	1
#####				97.42			
###	42.9233	204	0.624976	657	25	0	1
#####				32.19			
###	67.26666	198	0.377726	116	20	0	0
#####				81.18			
###	22.44002	610	0.836565	89	-36	1	0
#####				93.66			
###	22.98786	484	0.587454	672	-30	0	1
#####				90.01			
###	85.80804	504	0.294045	521	-32	1	1
#####				97.51			
###	48.81525	922	0.714059	643	9	0	0
#####				83.20			
###	30.16484	617	0.527648	659	42	1	1
#####				60.96			
###	61.77946	575	0.534456	091	38	1	1
#####				51.83			
###	81.59948	808	0.481088	664	-18	1	1
#####				52.45			
###	37.26568	962	0.497012	199	-2	1	0
#####				80.70			
###	69.83124	744	0.765356	959	45	1	0
#####				82.20			
###	26.8278	969	0.102981	859	-16	1	1
#####				44.02			
###	24.13454	870	0.334363	514	-7	0	1
#####				90.76			
###	62.50837	536	0.075503	86	39	1	0
#####				80.04			
###	63.25081	122	0.753246	468	-40	0	0
#####				69.39			
###	70.99439	664	0.272302	252	48	0	1

#####				63.00			
###	78.08731	776	0.89743	727	21	1	1
#####				68.02			
###	98.06817	813	0.526578	63	27	0	0
#####				41.14			
###	61.30403	557	0.80075	72	23	1	0
#####				44.25			
###	45.83652	182	0.978931	909	15	0	0
#####				36.38			
###	83.6149	244	0.839789	151	-5	1	1
#####				40.75			
###	41.66658	184	0.866994	606	-42	0	0
#####				61.75			
###	55.11771	177	0.407984	855	-48	1	1
#####				67.12			
###	26.27651	556	0.551723	481	34	1	0
#####				31.25			
###	22.02806	977	0.253889	033	-25	1	0
#####				85.77			
###	97.01187	100	0.196113	585	21	1	0
#####				50.59			
###	86.87841	150	0.505508	176	-3	0	0
#####				93.82			
###	75.67794	784	0.595049	852	15	1	1
#####				97.72			
###	52.71624	816	0.339271	579	19	0	1
#####				42.98			
###	33.86355	871	0.569444	212	-23	0	0
#####				62.34			
###	32.51496	545	0.88746	681	42	0	1
#####				30.08			
###	40.01943	548	0.556722	623	-25	1	0
#####				71.88			
###	63.93813	980	0.720813	291	-26	0	0
#####				72.51			
###	77.16767	587	0.805315	145	-39	0	0
#####				47.32			
###	72.81579	899	0.988729	78	-46	0	0
#####				69.08			
###	42.39471	133	0.603197	889	47	1	1
#####				45.78			
###	96.38922	447	0.80685	781	-3	1	0
#####				41.25			
###	79.03175	194	0.962649	778	-14	0	0
#####				75.60			
###	64.34832	171	0.94441	636	28	1	1
#####				52.81			
###	68.93766	650	0.141082	478	-7	1	0
#####				71.31			
###	53.568	253	0.406392	848	49	0	0

##### ###	39.81848	349	0.32399	60.32 727	-36	0	0
##### ###	48.47781	773	0.086925	98.90 46	-8	1	1
##### ###	80.62769	537	0.633241	40.47 064	-3	0	0
##### ###	21.15148	217	0.735905	62.52 19	36	1	1
##### ###	29.28581	870	0.848128	77.63 196	19	1	0
##### ###	23.68021	990	0.122777	57.68 816	-5	1	0
##### ###	23.2583	405	0.876444	98.22 899	-8	1	1
##### ###	88.43685	367	0.642926	80.53 213	-30	1	0
##### ###	76.29263	153	0.703946	75.98 887	-28	1	0
##### ###	57.93391	335	0.910624	82.99 415	29	0	1
##### ###	27.82673	488	0.624761	96.68 54	-4	0	1
##### ###	59.32927	833	0.335866	93.54 731	-36	1	1
##### ###	57.87774	862	0.825107	80.69 997	-26	1	1
##### ###	33.85615	924	0.363059	82.44 131	-15	1	1
##### ###	54.70813	500	0.034228	40.21 455	24	0	0
##### ###	51.88038	723	0.830655	37.19 547	0	1	1
##### ###	69.26801	866	0.345192	69.96 332	-36	0	0
##### ###	70.80749	402	0.773835	31.28 573	17	1	0
##### ###	23.62432	306	0.362758	63.76 495	-30	1	0
##### ###	49.96901	328	0.861068	44.72 447	-38	0	1
##### ###	70.06879	952	0.219511	54.22 116	35	0	1
##### ###	60.2509	677	0.974547	84.30 633	-32	1	0
##### ###	88.51919	174	0.779759	95.88 663	-17	1	1
##### ###	72.69549	534	0.114238	35.06 914	27	1	1
##### ###	33.03475	202	0.565777	67.39 695	17	0	1

##### ###	25.6455	521	0.985367	91.77 734	1	0	1
##### ###	71.39354	803	0.471065	35.77 56	-24	0	0
##### ###	22.1209	863	0.182107	87.71 598	-22	0	0
##### ###	66.86205	837	0.484778	55.04 609	-23	0	1
##### ###	95.21842	905	0.512458	52.54 663	-16	0	0
##### ###	66.03793	405	0.741687	98.42 265	-43	1	1
##### ###	51.05359	197	0.698846	44.06 014	-35	1	1
##### ###	71.46306	949	0.40255	78.52 358	-15	0	0
##### ###	56.66023	897	0.218023	87.50 085	-21	1	0
##### ###	63.64934	434	0.645054	32.88 284	-33	1	0
##### ###	95.31718	958	0.421704	76.92 698	-49	0	1

electricityprice.py

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_squared_error
import matplotlib.pyplot as plt

# Load the dataset
data = pd.read_csv('electricity_data.csv')  # Replace 'electricity_data.csv'
with your dataset

# Drop non-numeric columns or unwanted columns (like 'Date')
data = data.select_dtypes(exclude=['object'])  # Selects only numeric columns

# Feature selection
features = data.drop('Electricity_Price', axis=1)  # Excluding the target
variable
target = data['Electricity_Price']

# Split data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(features, target,
test_size=0.2, random_state=42)

# Model training
model = RandomForestRegressor()
```

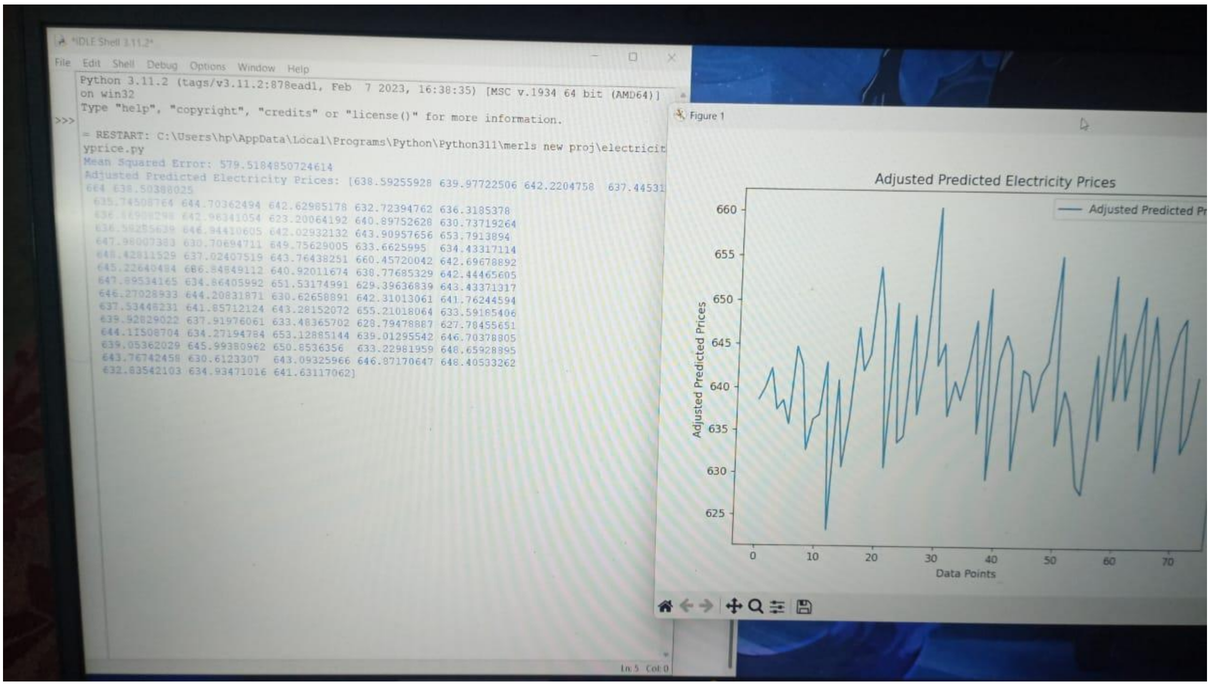
```
model.fit(X_train, y_train)

# Model evaluation
y_pred = model.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
print(f"Mean Squared Error: {mse}")

# Adjust predicted prices based on MSE (example adjustment)
adjusted_predicted_prices = y_pred + mse  # Adjust using MSE (example adjustment)
print("Adjusted Predicted Electricity Prices:", adjusted_predicted_prices)

# Visualization of Adjusted Predicted Prices
plt.figure(figsize=(8, 6))
plt.plot(adjusted_predicted_prices, label='Adjusted Predicted Prices')
plt.title('Adjusted Predicted Electricity Prices')
plt.xlabel('Data Points')
plt.ylabel('Adjusted Predicted Prices')
plt.legend()
plt.show()
```

output:



This comprehensive report provides a detailed breakdown of each step in the analysis, including code snippets for clarity. The included Python codes are designed to provide transparency and facilitate the reproducibility of the analysis.