

```

1 C:\Users\saima\PycharmProjects\pythonProject1\.venv\
  Scripts\python.exe "C:\Users\saima\PycharmProjects\
  pythonProject1\
  AICTE_WIND_POWER_GENERATION_FORECASTING\WIND POWER ML
  MODEL.py"
2
3
4 Head of all dataset:
5
6           Time  temperature_2m  ...
  windgusts_10m  Power
7 0  2017-01-02 00:00:00          28.5
   ...           1.4  0.1635
8 1  2017-01-02 01:00:00          28.4
   ...           4.4  0.1424
9 2  2017-01-02 02:00:00          26.8
   ...           3.2  0.1214
10 3 2017-01-02 03:00:00          27.4
   ...           1.6  0.1003
11 4 2017-01-02 04:00:00          27.3
   ...           4.0  0.0793
12
13 [5 rows x 10 columns]
14
15           Time  temperature_2m  ...
  windgusts_10m  Power
16 0  2017-01-02 00:00:00          14.5
   ...           9.9  0.2574
17 1  2017-01-02 01:00:00          14.5
   ...           9.5  0.2535
18 2  2017-01-02 02:00:00          14.7
   ...           9.4  0.2497
19 3  2017-01-02 03:00:00          14.7
   ...           9.1  0.2458
20 4  2017-01-02 04:00:00          14.8
   ...           8.7  0.2419
21
22 [5 rows x 10 columns]
23
24           Time  temperature_2m  ...
  windgusts_10m  Power

```

```

25 0 2017-01-02 00:00:00 29.7
    ... 8.8 0.3438
26 1 2017-01-02 01:00:00 29.6
    ... 8.5 0.3954
27 2 2017-01-02 02:00:00 29.8
    ... 9.7 0.4471
28 3 2017-01-02 03:00:00 29.8
    ... 9.9 0.4988
29 4 2017-01-02 04:00:00 30.2
    ... 9.4 0.5504
30
31 [5 rows x 10 columns]
32
33          Time  temperature_2m  ...
   windgusts_10m  Power
34 0 2017-01-02 00:00:00 22.7
    ... 5.3 0.3047
35 1 2017-01-02 01:00:00 22.0
    ... 5.7 0.3516
36 2 2017-01-02 02:00:00 21.7
    ... 6.4 0.3985
37 3 2017-01-02 03:00:00 21.7
    ... 6.4 0.4454
38 4 2017-01-02 04:00:00 22.4
    ... 6.6 0.4922
39
40 [5 rows x 10 columns]
41
42
43
44 Tail of all datasets:
45          Time  temperature_2m  ...
   windgusts_10m  Power
46 43795 2021-12-31 19:00:00 34.1
    ... 2.5 0.1796
47 43796 2021-12-31 20:00:00 34.8
    ... 4.8 0.2066
48 43797 2021-12-31 21:00:00 34.1
    ... 4.3 0.2336
49 43798 2021-12-31 22:00:00 34.4
    ... 4.2 0.2606

```

```

50 43799 2021-12-31 23:00:00 35.0
    ... 4.3 0.2877
51
52 [5 rows x 10 columns]
53
54          Time  temperature_2m  ...
    windgusts_10m  Power
55 43795 2021-12-31 19:00:00 -17.9
    ... 9.6 0.2530
56 43796 2021-12-31 20:00:00 -18.4
    ... 10.3 0.2549
57 43797 2021-12-31 21:00:00 -18.5
    ... 9.9 0.2569
58 43798 2021-12-31 22:00:00 -18.7
    ... 9.9 0.2589
59 43799 2021-12-31 23:00:00 -18.3
    ... 8.9 0.2609
60
61 [5 rows x 10 columns]
62
63          Time  temperature_2m  ...
    windgusts_10m  Power
64 43795 2021-12-31 19:00:00 14.4
    ... 12.0 0.3275
65 43796 2021-12-31 20:00:00 12.6
    ... 12.3 0.3365
66 43797 2021-12-31 21:00:00 10.3
    ... 11.8 0.3454
67 43798 2021-12-31 22:00:00 8.1
    ... 11.1 0.3544
68 43799 2021-12-31 23:00:00 5.7
    ... 11.7 0.3633
69
70 [5 rows x 10 columns]
71
72          Time  temperature_2m  ...
    windgusts_10m  Power
73 43795 2021-12-31 19:00:00 25.5
    ... 8.2 0.3417
74 43796 2021-12-31 20:00:00 25.3
    ... 7.9 0.3342

```

```

75 43797 2021-12-31 21:00:00 24.9
... 7.9 0.3267
76 43798 2021-12-31 22:00:00 24.9
... 7.8 0.3192
77 43799 2021-12-31 23:00:00 24.9
... 7.8 0.3117
78
79 [5 rows x 10 columns]
80
81
82
83 Summary statistics of all dataset:
84
85
86 temperature_2m relativehumidity_2m ...
windgusts_10m Power
87 count 43800.000000 43800.000000 ...
43800.000000 43800.000000
88 mean 47.862911 72.288744
... 7.771795 0.405385
89 std 19.453691 16.852287
... 3.569147 0.288322
90 min -14.400000 18.000000
... 0.500000 0.000000
91 25% 32.100000 60.000000
... 5.000000 0.148900
92 50% 47.300000 74.000000
... 7.200000 0.347650
93 75% 64.500000 86.000000
... 10.000000 0.659600
94 max 94.100000 100.000000
... 29.200000 0.991300
95
96 [8 rows x 9 columns]
97
98 temperature_2m relativehumidity_2m ...
windgusts_10m Power
99 count 43800.000000 43800.000000 ...
43800.000000 43800.000000
100 mean 42.725605 69.085091
... 8.557470 0.249902

```

```

101 std          23.724354          17.317481
    ...          3.710385          0.209088
102 min          -31.200000          16.000000
    ...          0.500000          0.000000
103 25%          26.100000          56.000000
    ...          5.800000          0.076200
104 50%          42.700000          71.000000
    ...          8.200000          0.194950
105 75%          63.000000          83.000000
    ...          10.800000         0.381800
106 max          95.400000          100.000000
    ...          29.000000          0.985900
107
108 [8 rows x 9 columns]
109
110      temperature_2m  relativehumidity_2m  ...
      windgusts_10m      Power
111 count      43800.000000      43800.000000  ...
      43800.000000  43800.000000
112 mean          49.225632          68.290708
    ...          8.134600          0.307503
113 std          22.551070          17.865965
    ...          3.661115          0.263879
114 min          -26.700000          12.000000
    ...          0.500000          0.000000
115 25%          32.000000          55.000000
    ...          5.400000          0.077000
116 50%          50.300000          70.000000
    ...          7.700000          0.240700
117 75%          68.400000          83.000000
    ...          10.400000          0.498400
118 max          101.700000          100.000000
    ...          26.600000          0.999400
119
120 [8 rows x 9 columns]
121
122      temperature_2m  relativehumidity_2m  ...
      windgusts_10m      Power
123 count      43800.000000      43800.000000  ...
      43800.000000  43800.000000
124 mean          46.809829          70.956621

```

```

124   ...      7.688954      0.250926
125 std      21.561586      16.969744
    ...      3.458954      0.228814
126 min     -28.800000      9.000000
    ...      0.500000      0.000000
127 25%      30.300000      59.000000
    ...      5.000000      0.066700
128 50%      47.100000      73.000000
    ...      7.300000      0.184700
129 75%      65.400000      85.000000
    ...      9.900000      0.371825
130 max      93.800000     100.000000
    ...     26.400000      0.988800
131
132 [8 rows x 9 columns]
133
134
135
136 Missing values in all dataset:
137
138
139 Time      0
140 temperature_2m      0
141 relativehumidity_2m      0
142 dewpoint_2m      0
143 windspeed_10m      0
144 windspeed_100m      0
145 winddirection_10m      0
146 winddirection_100m      0
147 windgusts_10m      0
148 Power      0
149 dtype: int64
150
151 Time      0
152 temperature_2m      0
153 relativehumidity_2m      0
154 dewpoint_2m      0
155 windspeed_10m      0
156 windspeed_100m      0
157 winddirection_10m      0
158 winddirection_100m      0

```

```

159 windgusts_10m          0
160 Power                  0
161 dtype: int64
162
163 Time                    0
164 temperature_2m          0
165 relativehumidity_2m     0
166 dewpoint_2m            0
167 windspeed_10m          0
168 windspeed_100m         0
169 winddirection_10m       0
170 winddirection_100m     0
171 windgusts_10m          0
172 Power                  0
173 dtype: int64
174
175 Time                    0
176 temperature_2m          0
177 relativehumidity_2m     0
178 dewpoint_2m            0
179 windspeed_10m          0
180 windspeed_100m         0
181 winddirection_10m       0
182 winddirection_100m     0
183 windgusts_10m          0
184 Power                  0
185 dtype: int64
186
187
188
189 Column names in Location1 dataset: Index(['Time', '
    temperature_2m', 'relativehumidity_2m', 'dewpoint_2m
    ',
190         'windspeed_10m', 'windspeed_100m', '
    winddirection_10m',
191         'winddirection_100m', 'windgusts_10m', 'Power
    '],
192         dtype='object')
193
194 Column names in Location2 dataset: Index(['Time', '
    temperature_2m', 'relativehumidity_2m', 'dewpoint_2m

```

```

194 ',
195         'windspeed_10m', 'windspeed_100m', '
        winddirection_10m',
196         'winddirection_100m', 'windgusts_10m', 'Power
        '],
197         dtype='object')
198
199 Column names in Location3 dataset: Index(['Time', '
        temperature_2m', 'relativehumidity_2m', 'dewpoint_2m
        ',
200         'windspeed_10m', 'windspeed_100m', '
        winddirection_10m',
201         'winddirection_100m', 'windgusts_10m', 'Power
        '],
202         dtype='object')
203
204 Column names in Location4 dataset: Index(['Time', '
        temperature_2m', 'relativehumidity_2m', 'dewpoint_2m
        ',
205         'windspeed_10m', 'windspeed_100m', '
        winddirection_10m',
206         'winddirection_100m', 'windgusts_10m', 'Power
        '],
207         dtype='object')
208
209
210
211 Shape of Location1 dataset (rows, columns): (43800,
        10)
212
213 Shape of Location2 dataset (rows, columns): (43800,
        10)
214
215 Shape of Location3 dataset (rows, columns): (43800,
        10)
216
217 Shape of Location4 dataset (rows, columns): (43800,
        10)
218
219
220

```



```

221 Data types in all datasets:
222 Time                object
223 temperature_2m       float64
224 relativehumidity_2m  int64
225 dewpoint_2m          float64
226 windspeed_10m        float64
227 windspeed_100m       float64
228 winddirection_10m    int64
229 winddirection_100m   int64
230 windgusts_10m        float64
231 Power                float64
232 dtype: object
233
234 Time                object
235 temperature_2m       float64
236 relativehumidity_2m  int64
237 dewpoint_2m          float64
238 windspeed_10m        float64
239 windspeed_100m       float64
240 winddirection_10m    int64
241 winddirection_100m   int64
242 windgusts_10m        float64
243 Power                float64
244 dtype: object
245
246 Time                object
247 temperature_2m       float64
248 relativehumidity_2m  int64
249 dewpoint_2m          float64
250 windspeed_10m        float64
251 windspeed_100m       float64
252 winddirection_10m    int64
253 winddirection_100m   int64
254 windgusts_10m        float64
255 Power                float64
256 dtype: object
257
258 Time                object
259 temperature_2m       float64
260 relativehumidity_2m  int64
261 dewpoint_2m          float64

```

```

262 windspeed_10m          float64
263 windspeed_100m         float64
264 winddirection_10m       int64
265 winddirection_100m      int64
266 windgusts_10m          float64
267 Power                   float64
268 dtype: object
269
270
271
272 Mean values in all datasets:
273
274 temperature_2m           47.862911
275 relativehumidity_2m      72.288744
276 dewpoint_2m             38.569308
277 windspeed_10m           3.591147
278 windspeed_100m          6.284431
279 winddirection_10m        203.637329
280 winddirection_100m       203.343676
281 windgusts_10m           7.771795
282 Power                   0.405385
283 dtype: float64
284
285 temperature_2m           42.725605
286 relativehumidity_2m      69.085091
287 dewpoint_2m             32.215932
288 windspeed_10m           4.693236
289 windspeed_100m          7.572439
290 winddirection_10m        208.512626
291 winddirection_100m       206.555594
292 windgusts_10m           8.557470
293 Power                   0.249902
294 dtype: float64
295
296 temperature_2m           49.225632
297 relativehumidity_2m      68.290708
298 dewpoint_2m             38.225450
299 windspeed_10m           4.334103
300 windspeed_100m          7.047603
301 winddirection_10m        194.807100
302 winddirection_100m       194.897055

```

```

303 windgusts_10m          8.134600
304 Power                  0.307503
305 dtype: float64
306
307 temperature_2m          46.809829
308 relativehumidity_2m     70.956621
309 dewpoint_2m             37.054274
310 windspeed_10m           4.012071
311 windspeed_100m          6.612864
312 winddirection_10m       199.400731
313 winddirection_100m      201.359954
314 windgusts_10m           7.688954
315 Power                   0.250926
316 dtype: float64
317
318
319
320 Median values in all datasets:
321 temperature_2m          47.300000
322 relativehumidity_2m     74.000000
323 dewpoint_2m             38.100000
324 windspeed_10m           3.300000
325 windspeed_100m          6.080000
326 winddirection_10m       225.000000
327 winddirection_100m      226.000000
328 windgusts_10m           7.200000
329 Power                   0.34765
330 dtype: float64
331
332 temperature_2m          42.700000
333 relativehumidity_2m     71.000000
334 dewpoint_2m             32.000000
335 windspeed_10m           4.440000
336 windspeed_100m          7.400000
337 winddirection_10m       224.000000
338 winddirection_100m      218.000000
339 windgusts_10m           8.200000
340 Power                   0.19495
341 dtype: float64
342
343 temperature_2m          50.3000

```

```

344 relativehumidity_2m      70.0000
345 dewpoint_2m             38.1000
346 windspeed_10m           4.0500
347 windspeed_100m          6.9200
348 winddirection_10m        191.0000
349 winddirection_100m        193.0000
350 windgusts_10m            7.7000
351 Power                     0.2407
352 dtype: float64
353
354 temperature_2m            47.1000
355 relativehumidity_2m        73.0000
356 dewpoint_2m              37.1000
357 windspeed_10m            3.7500
358 windspeed_100m           6.5000
359 winddirection_10m          207.0000
360 winddirection_100m          211.0000
361 windgusts_10m             7.3000
362 Power                     0.1847
363 dtype: float64
364
365
366
367 Info of Location1 dataset:
368 <class 'pandas.core.frame.DataFrame'>
369 RangeIndex: 43800 entries, 0 to 43799
370 Data columns (total 10 columns):
371 #      Column              Non-Null Count  Dtype
372 ---  -
373 0      Time                   43800 non-null  object
374 1      temperature_2m         43800 non-null  float64
375 2      relativehumidity_2m    43800 non-null  int64
376 3      dewpoint_2m            43800 non-null  float64
377 4      windspeed_10m          43800 non-null  float64
378 5      windspeed_100m         43800 non-null  float64
379 6      winddirection_10m      43800 non-null  int64
380 7      winddirection_100m     43800 non-null  int64
381 8      windgusts_10m          43800 non-null  float64
382 9      Power                  43800 non-null  float64
383 dtypes: float64(6), int64(3), object(1)
384 memory usage: 3.3+ MB

```

```

385
386
387 Info of Location2 dataset:
388 <class 'pandas.core.frame.DataFrame'>
389 RangeIndex: 43800 entries, 0 to 43799
390 Data columns (total 10 columns):
391 #      Column                                Non-Null Count  Dtype
392 ---  -
393 0      Time                                43800 non-null  object
394 1      temperature_2m                     43800 non-null  float64
395 2      relativehumidity_2m                43800 non-null  int64
396 3      dewpoint_2m                       43800 non-null  float64
397 4      windspeed_10m                     43800 non-null  float64
398 5      windspeed_100m                    43800 non-null  float64
399 6      winddirection_10m                 43800 non-null  int64
400 7      winddirection_100m                43800 non-null  int64
401 8      windgusts_10m                     43800 non-null  float64
402 9      Power                             43800 non-null  float64
403 dtypes: float64(6), int64(3), object(1)
404 memory usage: 3.3+ MB
405
406
407 Info of Location3 dataset:
408 <class 'pandas.core.frame.DataFrame'>
409 RangeIndex: 43800 entries, 0 to 43799
410 Data columns (total 10 columns):
411 #      Column                                Non-Null Count  Dtype
412 ---  -
413 0      Time                                43800 non-null  object
414 1      temperature_2m                     43800 non-null  float64
415 2      relativehumidity_2m                43800 non-null  int64
416 3      dewpoint_2m                       43800 non-null  float64
417 4      windspeed_10m                     43800 non-null  float64
418 5      windspeed_100m                    43800 non-null  float64
419 6      winddirection_10m                 43800 non-null  int64
420 7      winddirection_100m                43800 non-null  int64
421 8      windgusts_10m                     43800 non-null  float64
422 9      Power                             43800 non-null  float64
423 dtypes: float64(6), int64(3), object(1)
424 memory usage: 3.3+ MB
425

```

```

426
427 Info of Location4 dataset:
428 <class 'pandas.core.frame.DataFrame'>
429 RangeIndex: 43800 entries, 0 to 43799
430 Data columns (total 10 columns):
431 #    Column                                Non-Null Count  Dtype
432 ---  -
433 0    Time                                43800 non-null  object
434 1    temperature_2m                     43800 non-null  float64
435 2    relativehumidity_2m                43800 non-null  int64
436 3    dewpoint_2m                       43800 non-null  float64
437 4    windspeed_10m                     43800 non-null  float64
438 5    windspeed_100m                    43800 non-null  float64
439 6    winddirection_10m                 43800 non-null  int64
440 7    winddirection_100m                43800 non-null  int64
441 8    windgusts_10m                     43800 non-null  float64
442 9    Power                             43800 non-null  float64
443 dtypes: float64(6), int64(3), object(1)
444 memory usage: 3.3+ MB
445
446
447
448
449 Merged Data - First 5 Rows:
450      Time  temperature_2m  ...
      windgusts_10m  Power
451 0  2017-01-02 00:00:00      28.5
      ...          1.4  0.1635
452 1  2017-01-02 01:00:00      28.4
      ...          4.4  0.1424
453 2  2017-01-02 02:00:00      26.8
      ...          3.2  0.1214
454 3  2017-01-02 03:00:00      27.4
      ...          1.6  0.1003
455 4  2017-01-02 04:00:00      27.3
      ...          4.0  0.0793
456
457 [5 rows x 10 columns]
458
459
460 Merged Data - Info:

```

```

461 <class 'pandas.core.frame.DataFrame'>
462 RangeIndex: 175200 entries, 0 to 175199
463 Data columns (total 10 columns):
464 #    Column                                Non-Null Count  Dtype
465 ---  -
466 0    Time                                175200 non-null object
467 1    temperature_2m                     175200 non-null float64
468 2    relativehumidity_2m                175200 non-null int64
469 3    dewpoint_2m                       175200 non-null float64
470 4    windspeed_10m                     175200 non-null float64
471 5    windspeed_100m                    175200 non-null float64
472 6    winddirection_10m                 175200 non-null int64
473 7    winddirection_100m               175200 non-null int64
474 8    windgusts_10m                    175200 non-null float64
475 9    Power                             175200 non-null float64
476 dtypes: float64(6), int64(3), object(1)
477 memory usage: 13.4+ MB
478
479
480
481 Merged Data - Statistical Summary:
482      temperature_2m  relativehumidity_2m  ...
      windgusts_10m      Power
483 count      175200.000000      175200.000000  ...
      175200.000000  175200.000000
484 mean          46.655994          70.155291
      ...          8.038205          0.303429
485 std          22.012738          17.326678
      ...          3.617488          0.257325
486 min         -31.200000          9.000000
      ...          0.500000          0.000000
487 25%          30.200000          57.000000
      ...          5.300000          0.087700
488 50%          46.900000          72.000000
      ...          7.600000          0.233100
489 75%          65.300000          84.000000
      ...          10.300000          0.474200
490 max          101.700000          100.000000
      ...          29.200000          0.999400
491
492 [8 rows x 9 columns]

```

```

493
494
495
496 Missing Values in Merged Data:
497 Time                                0
498 temperature_2m                     0
499 relativehumidity_2m                 0
500 dewpoint_2m                        0
501 windspeed_10m                      0
502 windspeed_100m                    0
503 winddirection_10m                  0
504 winddirection_100m                 0
505 windgusts_10m                      0
506 Power                              0
507 dtype: int64
508
509
510
511 Number of Duplicated Rows:
512 0
513
514
515
516 Column Names in Merged Data:
517 Index(['Time', 'temperature_2m', '
    relativehumidity_2m', 'dewpoint_2m',
518         'windspeed_10m', 'windspeed_100m', '
    winddirection_10m',
519         'winddirection_100m', 'windgusts_10m', 'Power
    '],
520         dtype='object')
521
522
523
524 Dropping 'Time' Column...
525
526
527 Merged Data - First 5 Rows After Dropping 'Time'
    Column:
528     temperature_2m  relativehumidity_2m  ...
    windgusts_10m    Power

```


529	0	28.5		85
	...	1.4	0.1635	
530	1	28.4		86
	...	4.4	0.1424	
531	2	26.8		91
	...	3.2	0.1214	
532	3	27.4		88
	...	1.6	0.1003	
533	4	27.3		88
	...	4.0	0.0793	
534				
535	[5 rows x 9 columns]			
536				
537				
538	Process finished with exit code 0			
539				