PS C:\Users\s> & C:/Users/s/AppData/Local/Microsoft/WindowsApps/python3.11.exe c:/Users/s/Desktop/VS\_Codes/Aerodynamic/Aerodynamic\_Blade\_Soluction.py

Degree Cl Cd Cm Lift to drag ratio

0 -180.0 0.000 0.0198 0.0000 0.000000

1 -175.0 0.374 0.0341 0.1880 10.967742

2 -170.0 0.749 0.0955 0.3770 7.842932

3 -160.0 0.659 0.2807 0.2747 2.347702

4 -155.0 0.736 0.3919 0.3130 1.878030

.. ... ... ... ... ...

122 155.0 -0.798 0.4116 -0.3349 -1.938776

123 160.0 -0.714 0.2931 -0.2942 -2.436029

124 170.0 -0.749 0.0971 -0.3771 -7.713697

125 175.0 -0.374 0.0334 -0.1879 -11.197605

126 180.0 0.000 0.0198 0.0000 0.000000

[127 rows x 5 columns]

No artists with labels found to put in legend. Note that artists whose label start with an underscore are ignored when legend() is called with no argument.

174.3103448

Degree Cl Cd Cm Lift to drag ratio

61 5.0 1.011 0.0058 -0.124 174.310345

5.0

1.011

RNodes AeroTwst DRNodes Chord NFoil Unnamed: 4 PrnElm

0 2.8667 13.308 2.7333 3.542 1 NOPRINT

1 5.6000 13.308 2.7333 3.854 1 NOPRINT

2 8.3333 13.308 2.7333 4.167 2 NOPRINT

3 11.7500 13.308 4.1000 4.557 3 NOPRINT

4 15.8500 11.480 4.1000 4.652 4 NOPRINT

5 19.9500 10.162 4.1000 4.458 4 NOPRINT

6 24.0500 9.011 4.1000 4.249 5 NOPRINT

7 28.1500 7.795 4.1000 4.007 6 NOPRINT

8 32.2500 6.544 4.1000 3.748 6 NOPRINT

9 36.3500 5.361 4.1000 3.502 7 NOPRINT

10 40.4500 4.188 4.1000 3.256 7 NOPRINT

11 44.5500 3.125 4.1000 3.010 8 NOPRINT

12 48.6500 2.319 4.1000 2.764 8 NOPRINT

13 52.7500 1.526 4.1000 2.518 8 NOPRINT

14 56.1667 0.863 2.7333 2.313 8 NOPRINT

15 58.9000 0.370 2.7333 2.086 8 NOPRINT

16 61.6333 0.106 2.7333 1.419 8 NOPRINT

0 2.8667

1 5.6000

2 8.3333

3 11.7500

4 15.8500

5 19.9500

6 24.0500

7 28.1500

8 32.2500

9 36.3500

10 40.4500

11 44.5500

12 48.6500

13 52.7500

14 56.1667

15 58.9000

16 61.6333

Name: RNodes, dtype: float64

For r = 2.8667: Result = []

For r = 5.6: Result = [59.462306457237204]

For r = 8.3333: Result = [59.462306457237204, 41.97493401088199]

For r = 11.75: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922]

For r = 15.85: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612]

For r = 19.95: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874]

For r = 24.05: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764]

For r = 28.15: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864]

For r = 32.25: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814]

For r = 36.35: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229]

For r = 40.45: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077]

For r = 44.55: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852]

For r = 48.65: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852, 2.6704481043120047]

For r = 52.75: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852, 2.6704481043120047, 2.030779954414248]

For r = 56.1667: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852, 2.6704481043120047, 2.030779954414248, 1.4891663959275574]

For r = 58.9: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852, 2.6704481043120047, 2.030779954414248, 1.4891663959275574, 1.097489986081471]

For r = 61.6333: Result = [59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852, 2.6704481043120047, 2.030779954414248, 1.4891663959275574, 1.097489986081471, 0.8165179873501573]

[59.462306457237204, 41.97493401088199, 30.753995929541922, 22.05059700708612, 15.734104734616874, 11.73875855842764, 9.00821226687864, 7.032191945895814, 5.539183728628229, 4.372837573824077, 3.4372357022852, 2.6704481043120047, 2.030779954414248, 1.4891663959275574, 1.097489986081471, 0.8165179873501573, 0.5602219024525228]

For r = 2.8667: Result = []

For r = 5.6: Result = [22.430582895204765]

For r = 8.3333: Result = [22.430582895204765, 18.1735142241734]

For r = 11.75: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771]

For r = 15.85: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341]

For r = 19.95: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135]

For r = 24.05: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276]

For r = 28.15: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824]

For r = 32.25: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926]

For r = 36.35: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722]

For r = 40.45: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194]

For r = 44.55: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648]

For r = 48.65: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648, 3.3180946102827256]

For r = 52.75: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648, 3.3180946102827256, 3.042839949409356]

For r = 56.1667: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648, 3.3180946102827256, 3.042839949409356, 2.809481131610511]

For r = 58.9: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648, 3.3180946102827256, 3.042839949409356, 2.809481131610511, 2.640566392625111]

For r = 61.6333: Result = [22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648, 3.3180946102827256, 3.042839949409356, 2.809481131610511, 2.640566392625111, 2.5193176742611656]

[22.430582895204765, 18.1735142241734, 14.525438337673771, 11.305436787606341, 8.80097374635135, 7.159683739189276, 6.017463537827824, 5.18219810960926, 4.546960757775722, 4.048539960826194, 3.647501845374648, 3.3180946102827256, 3.042839949409356, 2.809481131610511, 2.640566392625111, 2.5193176742611656, 2.4086645178811623]

r Chord Betz Chord NREL Twist Betz Twist NREL

0 2.8667 NaN 3.542 NaN 13.308

1 5.6000 NaN 3.854 NaN 13.308

2 8.3333 NaN 4.167 NaN 13.308

3 11.7500 NaN 4.557 NaN 13.308

4 15.8500 NaN 4.652 NaN 11.480

5 19.9500 NaN 4.458 NaN 10.162

6 24.0500 NaN 4.249 NaN 9.011

7 28.1500 NaN 4.007 NaN 7.795

8 32.2500 NaN 3.748 NaN 6.544

9 36.3500 NaN 3.502 NaN 5.361

10 40.4500 NaN 3.256 NaN 4.188

11 44.5500 NaN 3.010 NaN 3.125

12 48.6500 NaN 2.764 NaN 2.319

13 52.7500 NaN 2.518 NaN 1.526

14 56.1667 NaN 2.313 NaN 0.863

15 58.9000 NaN 2.086 NaN 0.370

16 61.6333 NaN 1.419 NaN 0.106

r Chord Betz Chord NREL Twist Betz Twist NREL

0 2.8667 22.430583 3.542 59.462306 13.308

1 5.6000 18.173514 3.854 41.974934 13.308

2 8.3333 14.525438 4.167 30.753996 13.308

3 11.7500 11.305437 4.557 22.050597 13.308

4 15.8500 8.800974 4.652 15.734105 11.480

5 19.9500 7.159684 4.458 11.738759 10.162

6 24.0500 6.017464 4.249 9.008212 9.011

7 28.1500 5.182198 4.007 7.032192 7.795

8 32.2500 4.546961 3.748 5.539184 6.544

9 36.3500 4.048540 3.502 4.372838 5.361

10 40.4500 3.647502 3.256 3.437236 4.188

11 44.5500 3.318095 3.010 2.670448 3.125

12 48.6500 3.042840 2.764 2.030780 2.319

13 52.7500 2.809481 2.518 1.489166 1.526

14 56.1667 2.640566 2.313 1.097490 0.863

15 58.9000 2.519318 2.086 0.816518 0.370

16 61.6333 2.408665 1.419 0.560222 0.106