Spoiler

<<Inputs>>
- mid airfoil
- tip airfoil
- spoiler span
- spoiler chord
- spoiler angle

- strut airfoil shape?
- strut lateral location
- strut height
- strut chord
- strut thickness
- strut sweep
- strut cant

- endplate present?
- endplate thickness
- endplate sweep
- endplate cant

<<Attributes>>
- total wetted area

<<part>>
main_plate

MainPlate

<<Inputs>>
- mid airfoil
- tip airfoil
- span
- chord
- angle
- tip cant

<<@Inputs>>
- section positions

<<Attributes>>
- wetted area

<<part>>
section_mid

<<part>>
section_tip

Section

<<Inputs>>
- airfoil name
- chord
- angle

1

AvlAnalysis

<<Inputs>>
- spoiler geometry
- flow velocity
- flow density

<<Attributes>>
- total downforce
- total drag foce
- lift distribution along span
- drag distribution along span

1

<<part>>
struts

1

<<part>>
strut_left

OR
If airfoil_shape = True: StrutAirfoil
If airfoil_shape = False: StrutPlate

1

<<part>>
strut_right

StrutPlate

<<Inputs>>
- chord
- height
- thickness
- sweep
- cant

<<@Inputs>>
- spanwise position

<<Attributes>>
- wetted area

StrutAirfoil

<<Inputs>>
- chord
- height
- thickness
- sweep
- cant

<<@Inputs>>
- spanwise position

<< Attributes>>
- wetted area

StructuralAnalysis

<<Inputs>>
- spoiler geometry
- flow maximum velocity
- flow density
- young's modulus
- yield strength
- shear strength
- material density
- poisson ratio

<<Attributes>>
- stress distribution along span
- deflection along span
- skin thickness
- number of ribs

1

<<part>>
endplates

1

<<part>>
endplate_left

IF
If endplate_present = True: Endplate

1

<<part>>
endplate_right

Endplate

<<Inputs>>
- thickness
- sweep
- cant

<<@Inputs>>
- chord
- height
- spanwise position

<<Attributes>>
- wetted area

WeightEstimation

<<Inputs>>
- spoiler geometry
- material density
- number of ribs
- skin thickness

<<Attributes>>
- spoiler weight