File - C:\Users\geoff\Desktop\FlyOx Concept\Python\engines\weights.py

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import sys
sys.path.append('../')
from API.db_API import write_to_db, read_from_db

import numpy as np
import matplotlib.pylab as plt

print( '  EMPTY WEIGHT BREAKDOWN                          ')
#initial percentage weights as given by Kundu

mtow = read_from_db('finalMTOW')
wfus=0.085*mtow
wwing=0.09*mtow
whtail=0.02*mtow
wvtail=0.016*mtow
wnacelle=0.016*mtow
wundercarriage=0.05*mtow
wengine=0.185*mtow
wenginecontrol=0.02*mtow
wfuelsystem=0.015*mtow
woilsystem=0.003*mtow
wapu=0*mtow
wflightcontsys=0.015*mtow
whydpneu=0.0055*mtow
welectrical=0.025*mtow
winstrument=0.008*mtow
wavionics=0.02*mtow
wecs=0.004*mtow
woxyg=0*mtow
wfurnishings=0.04*mtow
wmiscelleneous=0.0015*mtow
wcontigency=0.01*mtow

print( '  A) FUSELAGE                          ' + str(wfus)  + '   lb')
print( '  B) WING                              ' + str(wwing)+ ' lb'  )
print( '   C) PROPULSION ')
print( '      a) engine dry weight ' + str(wengine)+ ' lb'  )
print( '      b) nacelle           ' + str(wnacelle) + '  lb')
print( '      c) engine control    ' + str(wenginecontrol) + '  lb')
print( '  D) UNDERCARRIAGE                     ' + str(wundercarriage) +'    lb'   )
print( '  E) TAIL                    '  )

print( '      a) horizontal tail      ' + str(whtail) + '   lb')
print( '      b) verticall tail       ' + str(wvtail) + '   lb')
print( '  F) SYSTEMS  ')
print( '      a) fuel system       ' + str(wfuelsystem) + '   lb')
print( '      b) oil system        ' + str(woilsystem) +'  lb')
print( '      c) a.p.u             ' + str(wapu) +'      lb')
print( '      d) flight contr. sys ' + str(wflightcontsys) + '   lb')
print( '      e) hyd & pneu sys    ' + str(whydpneu)+'  lb'  )
print( '      f) electrical system ' + str(welectrical)+ '  lb')
print( '      g) instruments       ' + str(winstrument)+'  lb'  )
print( '      h) avionics          ' + str(wavionics)+ '   lb'  )
print( '      i) ecs               ' + str(wecs) +'  lb')
print( '      j) oxygen system     ' + str(woxyg) +'      lb')
print( '  G) FURNISHINGS                       ' + str(wfurnishings)+' lb'  )
print( '  H) CONTIGENCY                        ' + str(wcontigency) +'  lb')
print( '  I)MISCELLLENEOUS                     ' + str(wmiscelleneous)+'  lb')
print( '                                       _________     ')

calcemptyw=wfus+wwing+whtail+wvtail+wnacelle+wundercarriage+wengine+wenginecontrol+wfuelsystem+
woilsystem+wapu+wflightcontsys+whydpneu+welectrical+winstrument+wavionics+wecs+woxyg+wfurnishings+
wmiscelleneous+wcontigency

We = read_from_db('emptyWeight')

error=((calcemptyw-We)/We)*100
print( '  TOTAL CALCULATED EMPTY WEIGHT        ' + str(calcemptyw)+'  lb' )
print( '                              ')
print( '  INITIAL ESTIMATED EMPTY WEIGHT       ' + str(We)+'  lb')

print( '  PERCENTAGE ERROR            ' + str(error),' %' )
```