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"""
Carbon and kWh calculator. Searches folder for slurm job output files.
Calculates the total core hours used.
You can specify a start date for the seach.
Uses simple model (http://www.archer.ac.uk/about-archer/hardware/,
carbon trust) to convert this to kWh and kg of carbon.
Requires Python 3.5. For start date functionality requires Mac OS.
"""
import datetime
import time
import os
import glob
import argparse
import sys

folder = sys.argv[1]
startdate = sys.argv[2]

TotalNodeHours = 0
nodeHours = 0
for filename in glob.iglob(folder+"/**/*.o[!ut]*",recursive=True):
    if startdate:
        stat = os.stat(filename)
        creationDate = stat.st_birthtime
        if creationDate > startdate:
            for line in open(filename):
                  if "Resources allocated:" in line:
                   ncpus = line.split("ncpus=")[1].split(",vmem")[0]
                       walltime = line.split("walltime=")[1]
                       with open(folder+"/FilesFound.txt","a") as textfile:
                           textfile.write(filename+'\n')

                       nodes = int(ncpus) / 24
                    hours = int(walltime[:2])+int(walltime[3:5])/
                            60+int(walltime[6:8])/3600
                    nodeHours = nodes*hours
    else:
        for line in open(filename):
                  if "Resources allocated:" in line:
                   ncpus = line.split("ncpus=")[1].split(",vmem")[0]
                       walltime = line.split("walltime=")[1]
                       with open(folder+"/FilesFound.txt","a") as textfile:
                           textfile.write(filename+'\n')

                       nodes = int(ncpus) / 24
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            hours = int(walltime[:2])+int(walltime[3:5])/
                    60+int(walltime[6:8])/3600
            nodeHours = nodes*hours

    if nodeHours is not None:
        TotalNodeHours += nodeHours

if TotalNodeHours==0:
    print ("zero node hours found....aborting...")

else:
    kWh = TotalNodeHours * (1200/4920)
    kgCo2 = kWh*0.5246
    text = """Total kWh for this folder: {0} \n
           Total kg of CO2 for this folder: {1}""".format(kWh, kgCo2)
    print (text)
```