```bash
#!/bin/bash
# Created by Darren Holland
# Modified by Darren Holland 2020-11-02
#**********************************************************************
# File for running MOGA design evaluation and passing the output back
# to Dakota.
#**********************************************************************
# $1 is foldername.para FROM Dakota
# $2 is foldername.res returned to Dakota


# --------------
# PRE-PROCESSING
# --------------
# Get the project name and design number from the filename
temp=$1
temp2="$(pwd)"
projname="${temp%.*}"
extension="${temp2#*.}"


# --------
# ANALYSIS
# --------
# Pass project, design number, and result filename into design evaluation
../../GeantEval$projname.sh $projname $extension $2

# ---------------
# POST-PROCESSING
# ---------------
# Change the design number into a five digit value
if [[ $extension -lt 10 ]]
then
       fullext=""0000$extension""
fi
if [[ $extension -lt 100 ]] && [[ $extension -ge 10 ]]
then
       fullext=""000$extension""
fi
if [[ $extension -lt 1000 ]] && [[ $extension -ge 100 ]]
then
       fullext=""00$extension""
fi
if [[ $extension -lt 10000 ]] && [[ $extension -ge 1000 ]]
then
       fullext=""0$extension""
fi
if [[ $extension -ge 10000 ]]
then
       fullext=""$extension""
fi

# ONLY PULL OUT OBJECTIVE FUNCTIONS NEEDED FOR CURRENT ANALYSIS
# Extract objective value from the simulation output
# Use Time (Tmin), Accuracy (Amin), Mass (Mass), and MAC (avgSingleMAC) as
objective functions
cp $2 DesignResults.o
Bad_Geo=$(grep 'Bad_Geo ' "$2" | cut -c 8-)

# Put objective values in file to pass back to Dakota
if [[ $Bad_Geo -lt 1 ]]
then
     # Valid design
       grep 'avgSingleMAC ' "$2" | cut -c 14- >> results.tmp
       grep 'Ttotal ' "$2" | cut -c 8- >> results.tmp
       grep 'Amin ' "$2" | cut -c 6- >> results.tmp
```

```
        # Get mass from Geant output
    M=$(grep 'Mass' "./bld/"$projname"MOGA"$fullext"mass.txt" | cut -c 5- | rev
| cut -c 3- | rev)
        unit=$(grep 'Mass' "./bld/"$projname"MOGA"$fullext"mass.txt" | rev | cut -
c -2 | rev)
        # Express mass in g
        if [[ $unit == 'kg' ]]
        then
                Mass=$(awk -v dd="$M" 'BEGIN {printf "%.3f\n",dd*1000}');
        else
                if [[ $unit == 'g ' ]]
                then
                        Mass=$M
                else    # Unlikely unit (but theoretically possible for other
designs) is mg
                        Mass=$(awk -v dd="$M" 'BEGIN {printf "%.4f\n",dd/1000}');
                fi
        fi
        echo $Mass >> results.tmp
else
        # Invalid design, set to inf
        echo 'inf' >> results.tmp
        echo 'inf' >> results.tmp
        echo 'inf' >> results.tmp
        echo 'inf' >> results.tmp
fi

# Rename temporary file as return file
mv results.tmp $2
```