FINALCODE

DATE	19 november 2022
TEAM ID	PNT2022TMID48112
PROJECTNAME	SmartsolutionsforRailways

CODE:

```
# Import common
librariesimport numpy as
npimportpandasaspd
importmatplotlib.pyplotasplt


#Importthe
PyGeohydrolibaraytoolsimportpyge
ohydroasgh
frompygeohydroimportSSFR,plot
```

```
#Usethesmartsolutionforrailways(SSFR)s

sfr =SSFR()

#Specify date rangeofinterest

dates=("2020-01-01","2020-12-31")

#Filterstationsto haveonlythosewith properdates

stations=info_box[(info_box.begin_date<=dates[0])&(info_box.end_dat
e>=dates[1])].site_no.tolist()


#Removeduplicatesbyconvertingtoasetst

ations= set(stations)

#Specifycharacteristicsofinterest

select_attributes = journey time ,train announcement ,
waitingarrangement,securityinthestation,seatcondition


#Initializeastoragematrix

nldi_data=np.zeros((len(flow_data.columns),len(select_attributes)))


#Loop throughallgages,and requestNLDIdata neareach

gagefori,stinenumerate(flow_data.columns):


   #Navigateupallflowlinesfromgage

   flowlines=NLDI().navigate_byid(fsource='nwissite',
```

```
                    fid =
                    f'{st}',navigation="upstreamTributaries
                    ",source='flowlines',
                    distance=10)
    #Getthenearestcomid
    station_comid=flowlines.nhdplus_comid.to_list()[0]

    #SourceNLDIlocaldata
    nldi_data[i,:]=NLDI().getcharacteristic_byid(station_comid,"local",ch
ar_ids=select_attributes)
```