```
def calculate_kbdi(max_temp_f, precip_in, prev_kbdi=0):
    """Calculates the Keetch-Byram Drought Index (KBDI)"""

    # Calculate drought factor
    drought_factor = 0.968 * np.exp(0.0875 * max_temp_f + 1.5552) -
8.258

    # Adjust for precipitation
    if precip_in > 0.2:
        net_precip = precip_in - 0.2
    else:
        net_precip = 0

    # Calculate KBDI
    kbdi = max(0, min(800, prev_kbdi + drought_factor - net_precip))

    return kbdi

# Calculate KBDI for each day in your dataset
kbdi_values = []
for i in range(len(data)):
    max_temp = data['max_temp_f'][i]
    precip = data['precip_in'][i]
    if i == 0:
        prev_kbdi = 0
    else:
        prev_kbdi = kbdi_values[i - 1]

    kbdi = calculate_kbdi(max_temp, precip, prev_kbdi)
    kbdi_values.append(kbdi)

data['KBDI'] = kbdi_values

print(data)

import pandas as pd
import numpy as np

def calc_ffwi(temp, rh, wind, kbdi=None):
    """
    Calculates the Fosberg Fire Weather Index (FFWI) and the modified
FFWI (mFFWI).

    Parameters:
        temp (float): Temperature in degrees Fahrenheit
        rh (float): Relative humidity in percent
        wind (float): Wind speed in miles per hour
        kbdi (float, optional): Keetch-Byram Drought Index, required
for mFFWI

    Returns:
```

```
        tuple: (FFWI, mFFWI)
    """

    # Calculate equilibrium moisture content (m)
    if rh < 10:
        m = 10.03229 + 0.281073 * rh - 0.000578 * rh * temp
    elif 10 <= rh <= 50:
        m = 2.22749 + 0.160107 * rh - 0.01478 * temp
    else:
        m = 21.0606 + 0.005565 * rh**2 - 0.00035 * rh * temp -
0.483199 * rh

    # Calculate Fosberg Fire Weather Index (FFWI)
    ffwi = np.exp(0.05039 * temp - 0.02016 * rh + 0.00504 * wind)

    # Calculate modified FFWI (mFFWI) if KBDI is provided
    if kbdi is not None:
        fa = 1 + (kbdi / 100)
        mffwi = ffwi * fa
    else:
        mffwi = None

    return ffwi, mffwi

# Example usage
temp = 80
rh = 30
wind = 10
kbdi = 500

ffwi, mffwi = calc_ffwi(temp, rh, wind, kbdi)

print("FFWI:", ffwi)
print("mFFWI:", mffwi)
```