

Import relevant packages here.

```
In [ ]: import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
import math
```

Load the data and verify it is loaded correctly.

- Print it (head, tail, or specific rows, choose a sensible number of rows).
- Compare it to the source file.

```
In [ ]: data = pd.read_csv("cf_data.csv")
data
```

```
Out [ ]:
```

	dv	s	a
0	-0.743240	53.5427	1.242570
1	-0.557230	53.6120	1.777920
2	-0.454769	53.6541	0.544107
3	-0.525396	53.7030	-0.294755
4	-0.601285	53.7592	-0.290961
...
73903	5.198740	116.1390	-0.795081
73904	5.104280	115.6270	-0.314263
73905	5.137640	115.1180	0.232283
73906	5.153480	114.5990	0.262078
73907	5.258680	113.1120	-0.612440

73908 rows × 3 columns

In the ensuing, you will use `numpy`.

Let's create a grid for the values to plot. But first create **two arrays named `dv` and `s`** using `numpy.linspace` that hold the grid values at the relevant indices in their respective dimension of the grid.

Create a **grid named `a`** with zeros using `numpy.zeros` in to which calculated acceleration values can be stored.

Let the grid span:

- Speed difference `dv` [m/s]
 - From -10 till 10
 - With 41 evenly spaced values
- Headway `s` [m]
 - From 0 till 200
 - With 21 evenly spaced values

```
In [ ]: dv = np.linspace(-10, 10, 41)
s = np.linspace(0, 200, 21)
a = np.zeros((len(dv), len(s))) # len(dv) means length of x axis and len(
print(a)
print(s)
print(dv)
```

Create from the imported data 3 separate `numpy` arrays for each column `dv`, `s` and `a`. (We do this for speed reasons later.)

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- You can access the data of each column in a `DataFrame` using `data.xxx` where `xxx` is the column name (not as a string).
- Use the method `to_numpy()` to convert a column to a `numpy` array.

```
In [ ]: DV = data.dv.to_numpy()
S = data.s.to_numpy()
A = data.a.to_numpy()

print(DV)
print(S)
print(A)
```

```
[-0.74324 -0.55723 -0.454769 ...  5.13764  5.15348  5.25868 ]
[ 53.5427  53.612  53.6541 ... 115.118 114.599 113.112 ]
[ 1.24257  1.77792  0.544107 ...  0.232283  0.262078 -0.61244 ]
```

Create an algorithm that calculates all the acceleration values and stores them in the grid. The algorithm is described visually in the last part of the lecture. At each grid point, it calculates a weighted mean of all measurements. The weights are given by an exponential function, based on the 'distance' between the grid point, and the measurement values of `dv` and `s`. To get you started, how many `for`-loops do you need?

For this you will need `math`.

Use an *upsilon* of 1.5m/s and a *sigma* of 30m.

Warning: This calculation may take some time. So:

- Print a line for each iteration of the outer-most `for`-loop that shows you the progress.
- Test your code by running it only on the first 50 measurements of the data.

```
In [ ]: # ...
sigma = 30 # m
upsilon = 1.5 # m/s
#DV = DV[:50]
#S = S[:50]
#A = A[:50]
for i, speed in enumerate(dv):
    print(f"Processing dv grid point {i + 1}/{len(dv)}")
    for j, distance in enumerate(s):
        weighted_sum = 0
        total_weight = 0

        for k in range(len(DV)):
            delta_dv = speed - DV[k]
            delta_s = distance - S[k]
```

```

weight = np.exp(-abs(delta_dv)/upsilon - abs(delta_s)/sigma)

weighted_sum += weight * A[k]
total_weight += weight

print(f"At grid point ({i}, {j}): total_weight = {total_weight},

if total_weight > 0:
    a[i, j] = weighted_sum / total_weight

print("Finished")

```

Processing dv grid point 1/41

```

At grid point (0, 0): total_weight = 82.76657673072508, weighted_sum = 43.76616217361347
At grid point (0, 1): total_weight = 115.20206286465836, weighted_sum = 61.23316525906768
At grid point (0, 2): total_weight = 151.9956780599928, weighted_sum = 85.27056513740041
At grid point (0, 3): total_weight = 177.727014603773, weighted_sum = 110.01684777705982
At grid point (0, 4): total_weight = 183.9683259226321, weighted_sum = 120.67591603230454
At grid point (0, 5): total_weight = 173.5532033725617, weighted_sum = 115.48172905655895
At grid point (0, 6): total_weight = 153.5629896812729, weighted_sum = 98.77626121483164
At grid point (0, 7): total_weight = 132.74937277646129, weighted_sum = 81.05047882299597
At grid point (0, 8): total_weight = 116.08943817673965, weighted_sum = 63.55561874319231
At grid point (0, 9): total_weight = 103.32599297711072, weighted_sum = 49.79935691677611
At grid point (0, 10): total_weight = 93.53305097757776, weighted_sum = 37.9039263543886
At grid point (0, 11): total_weight = 86.22599030122927, weighted_sum = 28.057818152330594
At grid point (0, 12): total_weight = 78.2902683412589, weighted_sum = 19.98269260101273
At grid point (0, 13): total_weight = 68.60310572440481, weighted_sum = 12.372189195628923
At grid point (0, 14): total_weight = 57.96939614001013, weighted_sum = 7.299581739774015
At grid point (0, 15): total_weight = 51.3926977109841, weighted_sum = 2.18743499591928
At grid point (0, 16): total_weight = 49.352889215372215, weighted_sum = -3.021756044930785
At grid point (0, 17): total_weight = 51.46637226943119, weighted_sum = -8.796130003819904
At grid point (0, 18): total_weight = 54.36600011718717, weighted_sum = -13.877086692204715
At grid point (0, 19): total_weight = 54.07718720212466, weighted_sum = -16.237973167489393
At grid point (0, 20): total_weight = 49.8698291234159, weighted_sum = -1

```

1.757604378474827

Processing dv grid point 2/41

At grid point (1, 0): total_weight = 114.1986475684553, weighted_sum = 59.60860622691605

At grid point (1, 1): total_weight = 158.9472028440335, weighted_sum = 83.40343384338512

At grid point (1, 2): total_weight = 209.57276864051408, weighted_sum = 116.13760834993165

At grid point (1, 3): total_weight = 244.47323347822754, weighted_sum = 149.5395865413283

At grid point (1, 4): total_weight = 252.81926552425335, weighted_sum = 164.67498376680368

At grid point (1, 5): total_weight = 238.80327696052552, weighted_sum = 158.4167408286136

At grid point (1, 6): total_weight = 211.2234575270672, weighted_sum = 136.02709769107253

At grid point (1, 7): total_weight = 182.1478546595204, weighted_sum = 112.0086850548089

At grid point (1, 8): total_weight = 158.5194263673717, weighted_sum = 88.18847797362682

At grid point (1, 9): total_weight = 139.93688370466342, weighted_sum = 69.52865196386543

At grid point (1, 10): total_weight = 125.02158955402318, weighted_sum = 53.46897089627822

At grid point (1, 11): total_weight = 112.95722822676977, weighted_sum = 40.33324687097813

At grid point (1, 12): total_weight = 99.98489042537449, weighted_sum = 30.019155106955456

At grid point (1, 13): total_weight = 85.79296779682441, weighted_sum = 20.260144676092814

At grid point (1, 14): total_weight = 71.54339835470866, weighted_sum = 13.247010451070674

At grid point (1, 15): total_weight = 62.26992007871906, weighted_sum = 6.557312961630474

At grid point (1, 16): total_weight = 58.26793368590726, weighted_sum = 0.3276713976634366

At grid point (1, 17): total_weight = 58.87253557873143, weighted_sum = -6.27693428669759

At grid point (1, 18): total_weight = 59.588529887144745, weighted_sum = -11.825858782008835

At grid point (1, 19): total_weight = 56.87677561057363, weighted_sum = -14.014467874261655

At grid point (1, 20): total_weight = 51.54366657566431, weighted_sum = -9.412080985073068

Processing dv grid point 3/41

At grid point (2, 0): total_weight = 156.44874971553185, weighted_sum = 80.09563107926512

At grid point (2, 1): total_weight = 217.74191690251038, weighted_sum = 112.07961500801987

At grid point (2, 2): total_weight = 286.7788068558409, weighted_sum = 156.05508529938996

At grid point (2, 3): total_weight = 333.23939492075385, weighted_sum = 200.2860597044211

At grid point (2, 4): total_weight = 343.60262406459475, weighted_sum = 22

0.4479631581497
At grid point (2, 5): total_weight = 324.9120673917866, weighted_sum = 21
3.0107697857666
At grid point (2, 6): total_weight = 287.1818365411583, weighted_sum = 18
4.0113881230582
At grid point (2, 7): total_weight = 246.5113032751094, weighted_sum = 15
2.08510898069298
At grid point (2, 8): total_weight = 212.5797996060087, weighted_sum = 11
9.960451563299
At grid point (2, 9): total_weight = 184.72014231064722, weighted_sum = 9
4.68819192431074
At grid point (2, 10): total_weight = 160.79234097171658, weighted_sum = 7
2.78154137690404
At grid point (2, 11): total_weight = 139.5689909312009, weighted_sum = 5
4.89789851969863
At grid point (2, 12): total_weight = 119.85727868500797, weighted_sum = 4
1.58477027701876
At grid point (2, 13): total_weight = 101.64699919758414, weighted_sum = 2
9.936261805561532
At grid point (2, 14): total_weight = 84.61800053211509, weighted_sum = 2
0.68031686007161
At grid point (2, 15): total_weight = 73.112523361996, weighted_sum = 12.2
28869515714287
At grid point (2, 16): total_weight = 67.41730244827471, weighted_sum = 4.
76459330158276
At grid point (2, 17): total_weight = 66.5920543723285, weighted_sum = -2.
739951791516106
At grid point (2, 18): total_weight = 65.04134840538981, weighted_sum = -
8.583730510978697
At grid point (2, 19): total_weight = 59.52475553708041, weighted_sum = -1
0.44892439979621
At grid point (2, 20): total_weight = 53.064148539405345, weighted_sum = -
6.960160696453344
Processing dv grid point 4/41
At grid point (3, 0): total_weight = 212.98504624150917, weighted_sum = 10
5.30633960687307
At grid point (3, 1): total_weight = 296.40734608199534, weighted_sum = 14
7.38155210690192
At grid point (3, 2): total_weight = 389.7984974626989, weighted_sum = 20
5.17865993114347
At grid point (3, 3): total_weight = 450.6025890560512, weighted_sum = 26
1.9349490526988
At grid point (3, 4): total_weight = 461.99605153901507, weighted_sum = 28
6.3693294886913
At grid point (3, 5): total_weight = 436.2654786070931, weighted_sum = 27
7.3497829524425
At grid point (3, 6): total_weight = 385.4354525143681, weighted_sum = 24
2.26794273634093
At grid point (3, 7): total_weight = 328.784076907899, weighted_sum = 201.
4823721998261
At grid point (3, 8): total_weight = 279.82756473090774, weighted_sum = 15
9.21221101407818
At grid point (3, 9): total_weight = 238.20573501601703, weighted_sum = 12
5.54358111157498

At grid point (3, 10): total_weight = 200.52514200007857, weighted_sum = 9
5.82258533207454
At grid point (3, 11): total_weight = 166.84816652888193, weighted_sum = 7
1.90343432308714
At grid point (3, 12): total_weight = 138.9321221103322, weighted_sum = 5
4.20569967566048
At grid point (3, 13): total_weight = 116.7489526080664, weighted_sum = 3
9.952603705230224
At grid point (3, 14): total_weight = 97.90411859991558, weighted_sum = 2
8.60260484492611
At grid point (3, 15): total_weight = 84.72410083687677, weighted_sum = 1
8.442123141183927
At grid point (3, 16): total_weight = 77.7114441917041, weighted_sum = 9.8
1358784171256
At grid point (3, 17): total_weight = 75.65880634628705, weighted_sum = 1.
4836825526909656
At grid point (3, 18): total_weight = 71.83040164806746, weighted_sum = -
4.692027900172757
At grid point (3, 19): total_weight = 63.02070405719978, weighted_sum = -
6.517347546337672
At grid point (3, 20): total_weight = 54.60770662104132, weighted_sum = -
4.3144017536675205
Processing dv grid point 5/41
At grid point (4, 0): total_weight = 288.22327765516354, weighted_sum = 13
6.87644814944096
At grid point (4, 1): total_weight = 401.07953777322933, weighted_sum = 19
1.60525469670887
At grid point (4, 2): total_weight = 526.4365347203609, weighted_sum = 26
6.6964952668412
At grid point (4, 3): total_weight = 604.5799631344148, weighted_sum = 33
8.1848166072868
At grid point (4, 4): total_weight = 615.2997713906467, weighted_sum = 36
6.7261997325304
At grid point (4, 5): total_weight = 578.3964631803447, weighted_sum = 35
3.78259679554736
At grid point (4, 6): total_weight = 511.22828115251167, weighted_sum = 31
3.04727596886
At grid point (4, 7): total_weight = 433.78895529995543, weighted_sum = 26
2.7281373886555
At grid point (4, 8): total_weight = 364.2776605423668, weighted_sum = 20
8.2665573918608
At grid point (4, 9): total_weight = 304.15412345702424, weighted_sum = 16
3.32877412040747
At grid point (4, 10): total_weight = 249.36571475504604, weighted_sum = 1
23.36147702695779
At grid point (4, 11): total_weight = 201.55992369495183, weighted_sum = 9
2.24230324921784
At grid point (4, 12): total_weight = 164.1282970440429, weighted_sum = 6
9.32572413738406
At grid point (4, 13): total_weight = 136.28701445862157, weighted_sum = 5
1.637540638936485
At grid point (4, 14): total_weight = 114.66909605636793, weighted_sum = 3
8.19304950078821
At grid point (4, 15): total_weight = 99.39070984913305, weighted_sum = 2

6.26141787570393
At grid point (4, 16): total_weight = 90.60551447013559, weighted_sum = 1
6.526481420307984
At grid point (4, 17): total_weight = 86.75360700722504, weighted_sum = 7.
527364036886562
At grid point (4, 18): total_weight = 80.02419226173622, weighted_sum = 1.
6338603938390024
At grid point (4, 19): total_weight = 68.06167937388025, weighted_sum = -
0.9550158725878496
At grid point (4, 20): total_weight = 57.604191905569124, weighted_sum = -
0.5628694791424754
Processing dv grid point 6/41
At grid point (5, 0): total_weight = 390.7508198593913, weighted_sum = 17
8.37747429584704
At grid point (5, 1): total_weight = 543.7059963591398, weighted_sum = 24
9.75357616994782
At grid point (5, 2): total_weight = 712.307944096214, weighted_sum = 347.
5680596160419
At grid point (5, 3): total_weight = 813.2287628457082, weighted_sum = 43
7.95299113925785
At grid point (5, 4): total_weight = 823.3479339821923, weighted_sum = 47
2.60453339308185
At grid point (5, 5): total_weight = 770.4207350798745, weighted_sum = 45
3.94516372824364
At grid point (5, 6): total_weight = 679.5457428670918, weighted_sum = 40
5.19692956332545
At grid point (5, 7): total_weight = 574.127834768334, weighted_sum = 343.
0734468425262
At grid point (5, 8): total_weight = 476.45318929104224, weighted_sum = 27
2.6092330440581
At grid point (5, 9): total_weight = 391.72052415197305, weighted_sum = 21
2.867978890793
At grid point (5, 10): total_weight = 315.07951214548774, weighted_sum = 1
59.8663084873426
At grid point (5, 11): total_weight = 249.49637867970148, weighted_sum = 1
19.0695556065752
At grid point (5, 12): total_weight = 199.39022017982313, weighted_sum = 8
9.2441636939303
At grid point (5, 13): total_weight = 162.87206935704228, weighted_sum = 6
6.68351295916297
At grid point (5, 14): total_weight = 136.34469555800362, weighted_sum = 4
9.90165741745785
At grid point (5, 15): total_weight = 118.07379228362008, weighted_sum = 3
5.4960718817076
At grid point (5, 16): total_weight = 106.60702056119499, weighted_sum = 2
4.056391528951828
At grid point (5, 17): total_weight = 100.02093909884114, weighted_sum = 1
3.754759993719892
At grid point (5, 18): total_weight = 89.83350395309668, weighted_sum = 8.
131702776905502
At grid point (5, 19): total_weight = 75.22908892071356, weighted_sum = 4.
507579454816296
At grid point (5, 20): total_weight = 63.01495196613846, weighted_sum = 3.
2331723856346657

Processing dv grid point 7/41

At grid point (6, 0): total_weight = 530.6652965813747, weighted_sum = 23
2.7155426068017
At grid point (6, 1): total_weight = 738.327252173406, weighted_sum = 325.
9080180417862
At grid point (6, 2): total_weight = 965.5298267468377, weighted_sum = 45
3.4580397961687
At grid point (6, 3): total_weight = 1096.7406595744094, weighted_sum = 56
7.6944285940766
At grid point (6, 4): total_weight = 1105.3750572075771, weighted_sum = 60
8.9152153109558
At grid point (6, 5): total_weight = 1029.6515818223177, weighted_sum = 58
1.7259591573702
At grid point (6, 6): total_weight = 904.8361984899533, weighted_sum = 52
0.8850107275128
At grid point (6, 7): total_weight = 761.3206741741533, weighted_sum = 44
4.15274159579724
At grid point (6, 8): total_weight = 625.3842914127995, weighted_sum = 35
3.06556952521237
At grid point (6, 9): total_weight = 508.2561666028137, weighted_sum = 27
5.03151262097316
At grid point (6, 10): total_weight = 403.7434306187363, weighted_sum = 20
6.8301873664439
At grid point (6, 11): total_weight = 315.23784122123215, weighted_sum = 1
53.40835147989458
At grid point (6, 12): total_weight = 247.95130061950616, weighted_sum = 1
14.18367800461996
At grid point (6, 13): total_weight = 198.75808366281788, weighted_sum = 8
4.51551455741404
At grid point (6, 14): total_weight = 163.6406296970091, weighted_sum = 6
2.22740711981453
At grid point (6, 15): total_weight = 140.24185090322112, weighted_sum = 4
4.179679695597756
At grid point (6, 16): total_weight = 124.87654147375608, weighted_sum = 2
9.95699574307894
At grid point (6, 17): total_weight = 114.41022585916882, weighted_sum = 1
6.7902418557462
At grid point (6, 18): total_weight = 100.321181707656, weighted_sum = 10.
5640509010549
At grid point (6, 19): total_weight = 83.88222076646063, weighted_sum = 6.
587395787545784
At grid point (6, 20): total_weight = 70.29944731021247, weighted_sum = 4.
608750453789704

Processing dv grid point 8/41

At grid point (7, 0): total_weight = 722.2798971434895, weighted_sum = 30
5.76786037871415
At grid point (7, 1): total_weight = 1004.8466231983174, weighted_sum = 42
8.3067203330524
At grid point (7, 2): total_weight = 1311.8167331440109, weighted_sum = 59
5.8197142467421
At grid point (7, 3): total_weight = 1483.7814346602327, weighted_sum = 74
0.7817254516399
At grid point (7, 4): total_weight = 1488.618498834749, weighted_sum = 78
7.7653004898253

At grid point (7, 5): total_weight = 1379.5386909734234, weighted_sum = 74
6.5371019079372
At grid point (7, 6): total_weight = 1206.241700879436, weighted_sum = 66
7.0213064755443
At grid point (7, 7): total_weight = 1009.0727436376975, weighted_sum = 56
9.2664567704402
At grid point (7, 8): total_weight = 820.167337376372, weighted_sum = 450.
42033769276645
At grid point (7, 9): total_weight = 658.3741661629543, weighted_sum = 34
7.14867281721774
At grid point (7, 10): total_weight = 518.0686421061998, weighted_sum = 25
9.93074193610585
At grid point (7, 11): total_weight = 401.0515844379833, weighted_sum = 19
2.43709844669664
At grid point (7, 12): total_weight = 311.6617136936879, weighted_sum = 14
2.55519348948712
At grid point (7, 13): total_weight = 245.4801487477744, weighted_sum = 10
4.54214881381897
At grid point (7, 14): total_weight = 197.75470112511007, weighted_sum = 7
5.52357073961257
At grid point (7, 15): total_weight = 166.64857415160463, weighted_sum = 5
2.756017732027495
At grid point (7, 16): total_weight = 146.7280885732054, weighted_sum = 3
4.91839360691808
At grid point (7, 17): total_weight = 132.1199834122021, weighted_sum = 1
7.9238246942825
At grid point (7, 18): total_weight = 114.20569151124703, weighted_sum = 1
0.56999856785649
At grid point (7, 19): total_weight = 96.19363618470364, weighted_sum = 6.
742054144227122
At grid point (7, 20): total_weight = 81.25840958592899, weighted_sum = 4.
751949313736623
Processing dv grid point 9/41
At grid point (8, 0): total_weight = 983.4911337508784, weighted_sum = 40
4.0950887619438
At grid point (8, 1): total_weight = 1368.1397360303006, weighted_sum = 56
6.1558371170419
At grid point (8, 2): total_weight = 1783.0065730272647, weighted_sum = 78
7.4399379243927
At grid point (8, 3): total_weight = 2009.3213599627586, weighted_sum = 97
2.5530658985421
At grid point (8, 4): total_weight = 2005.632726511598, weighted_sum = 102
4.9571490296364
At grid point (8, 5): total_weight = 1846.8266258293593, weighted_sum = 96
2.7410085569752
At grid point (8, 6): total_weight = 1605.4018878582676, weighted_sum = 85
7.0443007209452
At grid point (8, 7): total_weight = 1335.5733822884922, weighted_sum = 72
9.3130964773468
At grid point (8, 8): total_weight = 1078.0391025514232, weighted_sum = 57
5.4938825324716
At grid point (8, 9): total_weight = 858.2904795394659, weighted_sum = 44
0.24392229242585
At grid point (8, 10): total_weight = 671.7716461128164, weighted_sum = 32

8.9786221622093
At grid point (8, 11): total_weight = 517.4192350222917, weighted_sum = 24
3.58340650477484
At grid point (8, 12): total_weight = 398.5830823088229, weighted_sum = 18
0.12832942369906
At grid point (8, 13): total_weight = 309.3563214386831, weighted_sum = 13
1.42458018734249
At grid point (8, 14): total_weight = 243.87228414565672, weighted_sum = 9
3.79247113293424
At grid point (8, 15): total_weight = 201.16451289505866, weighted_sum = 6
4.92787004810238
At grid point (8, 16): total_weight = 174.7610605517788, weighted_sum = 4
2.820937004626956
At grid point (8, 17): total_weight = 155.10276860572574, weighted_sum = 2
1.81372755334816
At grid point (8, 18): total_weight = 132.92574124088623, weighted_sum = 1
2.505674751091336
At grid point (8, 19): total_weight = 112.95630842533376, weighted_sum =
7.791767616394673
At grid point (8, 20): total_weight = 96.25616382428565, weighted_sum = 4.
938186258516969
Processing dv grid point 10/41
At grid point (9, 0): total_weight = 1336.240471223851, weighted_sum = 53
1.4383433198202
At grid point (9, 1): total_weight = 1858.6874591187075, weighted_sum = 74
4.7463157152184
At grid point (9, 2): total_weight = 2417.6211028390403, weighted_sum = 10
35.6171766308755
At grid point (9, 3): total_weight = 2714.5249024156333, weighted_sum = 12
71.4461644053288
At grid point (9, 4): total_weight = 2694.1612034347218, weighted_sum = 13
28.6048075898527
At grid point (9, 5): total_weight = 2462.468519851872, weighted_sum = 123
5.5019265460314
At grid point (9, 6): total_weight = 2123.9408565247654, weighted_sum = 10
92.1639282805183
At grid point (9, 7): total_weight = 1755.6881905440648, weighted_sum = 92
2.5816430041086
At grid point (9, 8): total_weight = 1411.0091989088928, weighted_sum = 72
7.1314865308563
At grid point (9, 9): total_weight = 1117.5407531467265, weighted_sum = 55
3.848520441331
At grid point (9, 10): total_weight = 870.7608665627598, weighted_sum = 41
2.4053368622249
At grid point (9, 11): total_weight = 668.8646450483941, weighted_sum = 30
5.4797062347875
At grid point (9, 12): total_weight = 512.2339357791233, weighted_sum = 22
5.86838784356104
At grid point (9, 13): total_weight = 392.91908897989526, weighted_sum = 1
64.19567002772837
At grid point (9, 14): total_weight = 303.6133656499948, weighted_sum = 11
5.92093312431753
At grid point (9, 15): total_weight = 244.44830870798643, weighted_sum = 7
9.16490153144119

At grid point (9, 16): total_weight = 208.0177381779458, weighted_sum = 5
0.802100020117166
At grid point (9, 17): total_weight = 181.95384664752015, weighted_sum = 2
5.81611347999882
At grid point (9, 18): total_weight = 155.171490504792, weighted_sum = 14.
684499038926988
At grid point (9, 19): total_weight = 132.88380182767227, weighted_sum =
8.512571840232567
At grid point (9, 20): total_weight = 114.77772784956035, weighted_sum =
4.386169102040628
Processing dv grid point 11/41
At grid point (10, 0): total_weight = 1809.5182065231218, weighted_sum = 6
88.3722200968323
At grid point (10, 1): total_weight = 2516.75235190332, weighted_sum = 96
4.9774831947537
At grid point (10, 2): total_weight = 3266.3078928317796, weighted_sum = 1
341.56087812898
At grid point (10, 3): total_weight = 3650.2739590222545, weighted_sum = 1
635.9977934609522
At grid point (10, 4): total_weight = 3596.163008044249, weighted_sum = 16
91.1901136615022
At grid point (10, 5): total_weight = 3258.8584162118077, weighted_sum = 1
554.4678423351986
At grid point (10, 6): total_weight = 2785.451547986499, weighted_sum = 13
59.1256433487756
At grid point (10, 7): total_weight = 2288.8823903767798, weighted_sum = 1
138.8199923006052
At grid point (10, 8): total_weight = 1834.8968256707635, weighted_sum = 8
95.9284572061387
At grid point (10, 9): total_weight = 1449.0432520544882, weighted_sum = 6
82.4461641887993
At grid point (10, 10): total_weight = 1124.9117582386025, weighted_sum =
508.02701807386154
At grid point (10, 11): total_weight = 863.1376149856596, weighted_sum = 3
76.93542470056366
At grid point (10, 12): total_weight = 659.0036101510748, weighted_sum = 2
79.20834727884454
At grid point (10, 13): total_weight = 501.46165028018606, weighted_sum =
202.67723866732845
At grid point (10, 14): total_weight = 381.5241852739399, weighted_sum = 1
41.98463156066484
At grid point (10, 15): total_weight = 300.70828891045784, weighted_sum =
95.83238252984887
At grid point (10, 16): total_weight = 250.11559764145161, weighted_sum =
59.970166167531154
At grid point (10, 17): total_weight = 215.41546423300784, weighted_sum =
31.07250282126217
At grid point (10, 18): total_weight = 183.19081340749278, weighted_sum =
17.95378656432096
At grid point (10, 19): total_weight = 157.84726552896598, weighted_sum =
10.35787101547895
At grid point (10, 20): total_weight = 137.5180389069482, weighted_sum =
4.625676450984911
Processing dv grid point 12/41

At grid point (11, 0): total_weight = 2421.7413949665965, weighted_sum = 8
70.0999300164245
At grid point (11, 1): total_weight = 3367.777193303195, weighted_sum = 12
20.2867978671593
At grid point (11, 2): total_weight = 4358.795364354127, weighted_sum = 16
97.3823126006118
At grid point (11, 3): total_weight = 4842.496164604445, weighted_sum = 20
54.837618227985
At grid point (11, 4): total_weight = 4732.736329918159, weighted_sum = 20
99.4275290483893
At grid point (11, 5): total_weight = 4253.652496095887, weighted_sum = 19
05.4675936305257
At grid point (11, 6): total_weight = 3602.4181009563404, weighted_sum = 1
639.9412153875164
At grid point (11, 7): total_weight = 2940.945031952482, weighted_sum = 13
62.4854100150628
At grid point (11, 8): total_weight = 2348.500734910597, weighted_sum = 10
69.6101034222286
At grid point (11, 9): total_weight = 1845.1360782304916, weighted_sum = 8
13.936468324414
At grid point (11, 10): total_weight = 1426.040088659839, weighted_sum = 6
06.0344122716548
At grid point (11, 11): total_weight = 1092.2471240819975, weighted_sum =
448.42818825820274
At grid point (11, 12): total_weight = 831.791450788792, weighted_sum = 33
0.8377459460307
At grid point (11, 13): total_weight = 629.9560306697549, weighted_sum = 2
39.6635854131655
At grid point (11, 14): total_weight = 474.7144899497408, weighted_sum = 1
67.28380824569442
At grid point (11, 15): total_weight = 368.87802639696724, weighted_sum =
112.22528606590814
At grid point (11, 16): total_weight = 301.6966615870218, weighted_sum = 6
9.27156082148962
At grid point (11, 17): total_weight = 255.94511340447005, weighted_sum =
36.99643510214815
At grid point (11, 18): total_weight = 216.60800466793384, weighted_sum =
22.59148416719369
At grid point (11, 19): total_weight = 187.85901638012055, weighted_sum =
13.45390442574374
At grid point (11, 20): total_weight = 164.10039286866078, weighted_sum =
6.217245997146131
Processing dv grid point 13/41
At grid point (12, 0): total_weight = 3155.044413733446, weighted_sum = 10
27.6151774752313
At grid point (12, 1): total_weight = 4386.7083117623815, weighted_sum = 1
442.4059265402102
At grid point (12, 2): total_weight = 5661.324081089731, weighted_sum = 20
15.9868742767117
At grid point (12, 3): total_weight = 6248.182200446471, weighted_sum = 24
36.3126195705454
At grid point (12, 4): total_weight = 6066.561453173888, weighted_sum = 24
81.121354252403
At grid point (12, 5): total_weight = 5416.686230565165, weighted_sum = 22

36.3486001090405
At grid point (12, 6): total_weight = 4561.538531223971, weighted_sum = 19
07.5179917007251
At grid point (12, 7): total_weight = 3705.6599382840272, weighted_sum = 1
577.3435351187563
At grid point (12, 8): total_weight = 2951.259634453121, weighted_sum = 12
38.5351670090267
At grid point (12, 9): total_weight = 2307.6421573954667, weighted_sum = 9
38.764416104015
At grid point (12, 10): total_weight = 1776.6616348744867, weighted_sum =
697.7212669328028
At grid point (12, 11): total_weight = 1357.5568318949747, weighted_sum =
514.3509883799604
At grid point (12, 12): total_weight = 1030.0875879613423, weighted_sum =
378.32093022658205
At grid point (12, 13): total_weight = 778.2624671379897, weighted_sum = 2
74.17018591453314
At grid point (12, 14): total_weight = 583.0109975424072, weighted_sum = 1
91.05270655027397
At grid point (12, 15): total_weight = 448.7125369281562, weighted_sum = 1
27.70444064400436
At grid point (12, 16): total_weight = 362.5050368336211, weighted_sum = 7
8.11937226540645
At grid point (12, 17): total_weight = 303.3632853070015, weighted_sum = 4
3.233867418069316
At grid point (12, 18): total_weight = 256.05275847932904, weighted_sum =
27.999115342677193
At grid point (12, 19): total_weight = 222.73544931743325, weighted_sum =
17.3270871938469
At grid point (12, 20): total_weight = 193.42444380433213, weighted_sum =
8.60543080096112
Processing dv grid point 14/41
At grid point (13, 0): total_weight = 4047.4204324049488, weighted_sum = 1
161.114641191389
At grid point (13, 1): total_weight = 5626.021573570147, weighted_sum = 16
31.8609980558294
At grid point (13, 2): total_weight = 7234.997616417508, weighted_sum = 22
99.4985906024795
At grid point (13, 3): total_weight = 7913.326273569982, weighted_sum = 27
80.637854832286
At grid point (13, 4): total_weight = 7612.871636232545, weighted_sum = 28
29.6331776372076
At grid point (13, 5): total_weight = 6740.3322669843055, weighted_sum = 2
540.636504094104
At grid point (13, 6): total_weight = 5634.571288973416, weighted_sum = 21
54.056652443255
At grid point (13, 7): total_weight = 4546.909169640689, weighted_sum = 17
75.112254649001
At grid point (13, 8): total_weight = 3597.7466032408106, weighted_sum = 1
392.9693923268778
At grid point (13, 9): total_weight = 2794.1610375166633, weighted_sum = 1
051.997847732333
At grid point (13, 10): total_weight = 2145.056734118985, weighted_sum = 7
81.2989004391835

At grid point (13, 11): total_weight = 1637.5052542248347, weighted_sum = 575.4945036656949
At grid point (13, 12): total_weight = 1239.6605799687866, weighted_sum = 423.4464858457281
At grid point (13, 13): total_weight = 935.9812698084589, weighted_sum = 307.55674191223585
At grid point (13, 14): total_weight = 697.7920880800302, weighted_sum = 214.90379729683949
At grid point (13, 15): total_weight = 532.3344775499867, weighted_sum = 144.29151504389472
At grid point (13, 16): total_weight = 424.57841940366114, weighted_sum = 89.16249474935239
At grid point (13, 17): total_weight = 348.50795345280625, weighted_sum = 53.22411337200741
At grid point (13, 18): total_weight = 290.5292792688244, weighted_sum = 36.576100051325135
At grid point (13, 19): total_weight = 248.7176870435472, weighted_sum = 24.228897271879102
At grid point (13, 20): total_weight = 211.0181057779057, weighted_sum = 14.500623607637058
Processing dv grid point 15/41
At grid point (14, 0): total_weight = 5144.690935077432, weighted_sum = 1267.2772800993923
At grid point (14, 1): total_weight = 7149.910673143092, weighted_sum = 1783.1171121430464
At grid point (14, 2): total_weight = 9157.681870207523, weighted_sum = 2536.591553307415
At grid point (14, 3): total_weight = 9914.546217678002, weighted_sum = 3074.154292178508
At grid point (14, 4): total_weight = 9435.525976361074, weighted_sum = 3125.89215614648
At grid point (14, 5): total_weight = 8282.325745173963, weighted_sum = 2796.2347857999193
At grid point (14, 6): total_weight = 6869.336503297097, weighted_sum = 2355.136577841983
At grid point (14, 7): total_weight = 5509.582074362817, weighted_sum = 1931.9413287798125
At grid point (14, 8): total_weight = 4335.375890776847, weighted_sum = 1511.9091143800465
At grid point (14, 9): total_weight = 3352.740492524678, weighted_sum = 1140.7279400331047
At grid point (14, 10): total_weight = 2570.4281716440883, weighted_sum = 849.2181497847781
At grid point (14, 11): total_weight = 1960.2129488631297, weighted_sum = 624.8210068128832
At grid point (14, 12): total_weight = 1478.2075163268084, weighted_sum = 456.02010728982236
At grid point (14, 13): total_weight = 1114.3317808631605, weighted_sum = 329.73974337366866
At grid point (14, 14): total_weight = 826.5257028447554, weighted_sum = 230.93727996328766
At grid point (14, 15): total_weight = 624.1848425564228, weighted_sum = 155.32788370298408
At grid point (14, 16): total_weight = 489.8550062579823, weighted_sum = 9


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6.22104632164027
At grid point (14, 17): total_weight = 391.0903133106255, weighted_sum = 6
0.325771484649096
At grid point (14, 18): total_weight = 316.8074383413395, weighted_sum = 4
2.340212453438006
At grid point (14, 19): total_weight = 261.89751626367826, weighted_sum =
29.204159160433104
At grid point (14, 20): total_weight = 215.46015068127144, weighted_sum =
19.30617400304167
Processing dv grid point 16/41
At grid point (15, 0): total_weight = 6433.90483260017, weighted_sum = 129
3.2239576201378
At grid point (15, 1): total_weight = 8939.952753492214, weighted_sum = 18
23.091443746886
At grid point (15, 2): total_weight = 11401.93740375957, weighted_sum = 26
39.797179897987
At grid point (15, 3): total_weight = 12222.811157751708, weighted_sum = 3
237.368681522487
At grid point (15, 4): total_weight = 11505.201124609648, weighted_sum = 3
302.769978075495
At grid point (15, 5): total_weight = 10014.995285718825, weighted_sum = 2
949.1050630055333
At grid point (15, 6): total_weight = 8251.771946496578, weighted_sum = 24
76.238622893796
At grid point (15, 7): total_weight = 6587.149094349685, weighted_sum = 20
28.2197398258947
At grid point (15, 8): total_weight = 5162.706928922848, weighted_sum = 15
86.7932566706295
At grid point (15, 9): total_weight = 3980.7330376571754, weighted_sum = 1
196.6423816701608
At grid point (15, 10): total_weight = 3048.734612137243, weighted_sum = 8
93.8126356933079
At grid point (15, 11): total_weight = 2322.3315289061748, weighted_sum =
659.0441621790089
At grid point (15, 12): total_weight = 1742.7528799646345, weighted_sum =
478.411166043495
At grid point (15, 13): total_weight = 1308.8266595876382, weighted_sum =
344.34754814385735
At grid point (15, 14): total_weight = 965.7264988372326, weighted_sum = 2
40.72085799941394
At grid point (15, 15): total_weight = 721.8526041768496, weighted_sum = 1
60.8634391708476
At grid point (15, 16): total_weight = 556.783113720291, weighted_sum = 9
7.99679143102564
At grid point (15, 17): total_weight = 432.3879181322711, weighted_sum = 6
2.766821314009
At grid point (15, 18): total_weight = 339.5461277345406, weighted_sum = 4
3.859672383658
At grid point (15, 19): total_weight = 271.47787608804356, weighted_sum =
30.370714636681853
At grid point (15, 20): total_weight = 217.84388488184834, weighted_sum =
20.424302688985073
Processing dv grid point 17/41
At grid point (16, 0): total_weight = 7874.423727199434, weighted_sum = 11
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69.9402576117338
At grid point (16, 1): total_weight = 10941.17779272989, weighted_sum = 16
55.8240182423297
At grid point (16, 2): total_weight = 13894.401206426226, weighted_sum = 2
490.3696769370813
At grid point (16, 3): total_weight = 14757.913318516119, weighted_sum = 3
141.7447409169
At grid point (16, 4): total_weight = 13767.792403484094, weighted_sum = 3
245.962995920257
At grid point (16, 5): total_weight = 11913.968605071293, weighted_sum = 2
915.09967022397
At grid point (16, 6): total_weight = 9764.8979030641, weighted_sum = 245
4.3770692416915
At grid point (16, 7): total_weight = 7758.6540739777865, weighted_sum = 2
019.3259945665243
At grid point (16, 8): total_weight = 6054.897487004601, weighted_sum = 15
84.8069423630277
At grid point (16, 9): total_weight = 4653.564887048458, weighted_sum = 11
95.7684456737968
At grid point (16, 10): total_weight = 3559.1851872037064, weighted_sum =
898.0358930542499
At grid point (16, 11): total_weight = 2706.9098739003384, weighted_sum =
667.1081757342316
At grid point (16, 12): total_weight = 2021.2444028672935, weighted_sum =
484.40873120894736
At grid point (16, 13): total_weight = 1511.3758564349446, weighted_sum =
348.3306628859818
At grid point (16, 14): total_weight = 1110.4118871827516, weighted_sum =
242.95359874641758
At grid point (16, 15): total_weight = 822.9981360647989, weighted_sum = 1
61.43706118818884
At grid point (16, 16): total_weight = 625.4381160816025, weighted_sum = 9
7.09526819097212
At grid point (16, 17): total_weight = 475.15897472590905, weighted_sum =
63.495298040456994
At grid point (16, 18): total_weight = 364.3239509466435, weighted_sum = 4
4.04328957969598
At grid point (16, 19): total_weight = 284.35754019473325, weighted_sum =
30.779843823024216
At grid point (16, 20): total_weight = 224.78396268731908, weighted_sum =
21.06024607109236
Processing dv grid point 18/41
At grid point (17, 0): total_weight = 9401.25154415918, weighted_sum = 84
7.2778576971704
At grid point (17, 1): total_weight = 13061.445872730415, weighted_sum = 1
210.9857208861881
At grid point (17, 2): total_weight = 16511.503689296096, weighted_sum = 1
995.700320059299
At grid point (17, 3): total_weight = 17388.05022098983, weighted_sum = 26
82.7335327382434
At grid point (17, 4): total_weight = 16102.4119681035, weighted_sum = 286
2.7447942989766
At grid point (17, 5): total_weight = 13879.829848817302, weighted_sum = 2
623.33115301843

At grid point (17, 6): total_weight = 11315.209660848965, weighted_sum = 225.3495289791167
At grid point (17, 7): total_weight = 8945.346533575357, weighted_sum = 1848.3929007285974
At grid point (17, 8): total_weight = 6947.385598397124, weighted_sum = 1457.9574661951308
At grid point (17, 9): total_weight = 5320.58535024929, weighted_sum = 1102.6852704133585
At grid point (17, 10): total_weight = 4054.120731781448, weighted_sum = 834.821511644372
At grid point (17, 11): total_weight = 3072.785926672677, weighted_sum = 628.3865740751422
At grid point (17, 12): total_weight = 2281.921041491627, weighted_sum = 457.4007164119117
At grid point (17, 13): total_weight = 1699.2806287799651, weighted_sum = 329.09953722896194
At grid point (17, 14): total_weight = 1245.9492981714723, weighted_sum = 229.55392324049
At grid point (17, 15): total_weight = 919.1524119521509, weighted_sum = 152.14749151326697
At grid point (17, 16): total_weight = 692.6236292151857, weighted_sum = 90.84183308218037
At grid point (17, 17): total_weight = 519.4315566419758, weighted_sum = 60.318289614470736
At grid point (17, 18): total_weight = 392.6574283616598, weighted_sum = 41.376613568235015
At grid point (17, 19): total_weight = 302.1469164235553, weighted_sum = 29.224746157419673
At grid point (17, 20): total_weight = 237.24967807917326, weighted_sum = 20.408318127573235
Processing dv grid point 19/41
At grid point (18, 0): total_weight = 10922.17759475981, weighted_sum = 294.9047714666376
At grid point (18, 1): total_weight = 15171.08425511964, weighted_sum = 447.580288243833
At grid point (18, 2): total_weight = 19092.318899038488, weighted_sum = 1105.4515758808523
At grid point (18, 3): total_weight = 19947.29819880628, weighted_sum = 1826.7224271524353
At grid point (18, 4): total_weight = 18352.6559137464, weighted_sum = 2116.362213915337
At grid point (18, 5): total_weight = 15772.720972800202, weighted_sum = 2029.6123354106985
At grid point (18, 6): total_weight = 12786.206937021849, weighted_sum = 1758.2031950632506
At grid point (18, 7): total_weight = 10060.825058298415, weighted_sum = 1492.7611390167688
At grid point (18, 8): total_weight = 7785.101164168257, weighted_sum = 1188.860784397393
At grid point (18, 9): total_weight = 5940.64839782011, weighted_sum = 904.5969105675048
At grid point (18, 10): total_weight = 4504.969375092438, weighted_sum = 692.937024087298
At grid point (18, 11): total_weight = 3402.2467806108784, weighted_sum =

529.0414495549263
At grid point (18, 12): total_weight = 2515.9784195261836, weighted_sum = 385.2268654960673
At grid point (18, 13): total_weight = 1868.481745564645, weighted_sum = 277.1473823362017
At grid point (18, 14): total_weight = 1367.9948181717218, weighted_sum = 192.2426032646953
At grid point (18, 15): total_weight = 1006.2124595576153, weighted_sum = 125.31852463798495
At grid point (18, 16): total_weight = 755.2127572787056, weighted_sum = 71.76189118294008
At grid point (18, 17): total_weight = 562.2955010559086, weighted_sum = 47.19925419964027
At grid point (18, 18): total_weight = 421.88051315494687, weighted_sum = 31.4601805800454
At grid point (18, 19): total_weight = 322.35250100929, weighted_sum = 22.54021991251493
At grid point (18, 20): total_weight = 253.00166829903026, weighted_sum = 16.178568589215153
Processing dv grid point 20/41
At grid point (19, 0): total_weight = 12149.24317176083, weighted_sum = -501.1269307110548
At grid point (19, 1): total_weight = 16871.60757087429, weighted_sum = -656.0880722709379
At grid point (19, 2): total_weight = 21166.557451520883, weighted_sum = -229.91578395129713
At grid point (19, 3): total_weight = 21985.04553219259, weighted_sum = 512.5484204917283
At grid point (19, 4): total_weight = 20138.789878510648, weighted_sum = 966.2850526794858
At grid point (19, 5): total_weight = 17266.258105712986, weighted_sum = 1097.537755673729
At grid point (19, 6): total_weight = 13932.106179245427, weighted_sum = 1027.8738955444207
At grid point (19, 7): total_weight = 10922.129788289978, weighted_sum = 937.727964191824
At grid point (19, 8): total_weight = 8429.824137357553, weighted_sum = 774.8951388886163
At grid point (19, 9): total_weight = 6403.143921233536, weighted_sum = 603.065871884359
At grid point (19, 10): total_weight = 4829.708401565077, weighted_sum = 479.62042985031394
At grid point (19, 11): total_weight = 3633.011671619649, weighted_sum = 379.0430678934872
At grid point (19, 12): total_weight = 2680.069932559921, weighted_sum = 278.25932570970417
At grid point (19, 13): total_weight = 1987.9763653751586, weighted_sum = 201.50985583005823
At grid point (19, 14): total_weight = 1454.2072522093831, weighted_sum = 137.9746219037015
At grid point (19, 15): total_weight = 1068.2681881782235, weighted_sum = 86.16513181419637
At grid point (19, 16): total_weight = 800.637229187273, weighted_sum = 43.54068563526066

At grid point (19, 17): total_weight = 593.8984073714621, weighted_sum = 26.80182472017098
At grid point (19, 18): total_weight = 443.94259696329857, weighted_sum = 16.221812926169328
At grid point (19, 19): total_weight = 337.9736174526715, weighted_sum = 12.262467494938036
At grid point (19, 20): total_weight = 265.56181032165955, weighted_sum = 9.684771225021585
Processing dv grid point 21/41
At grid point (20, 0): total_weight = 12715.269019444011, weighted_sum = -1470.214795779593
At grid point (20, 1): total_weight = 17656.746594292603, weighted_sum = -2004.0705095808455
At grid point (20, 2): total_weight = 22089.16335908275, weighted_sum = -1912.6744363078762
At grid point (20, 3): total_weight = 22842.58312030941, weighted_sum = -1167.8283974321469
At grid point (20, 4): total_weight = 20847.360171687546, weighted_sum = -500.5878401177911
At grid point (20, 5): total_weight = 17824.82048124757, weighted_sum = -91.55985352400488
At grid point (20, 6): total_weight = 14347.62931901503, weighted_sum = 111.63955715479898
At grid point (20, 7): total_weight = 11235.073113440169, weighted_sum = 248.07933690350575
At grid point (20, 8): total_weight = 8663.028935559763, weighted_sum = 265.12150805446345
At grid point (20, 9): total_weight = 6552.478745670736, weighted_sum = 236.3303281213262
At grid point (20, 10): total_weight = 4919.607423670943, weighted_sum = 217.98719559814788
At grid point (20, 11): total_weight = 3685.8438335628107, weighted_sum = 194.3366673418233
At grid point (20, 12): total_weight = 2715.984629405792, weighted_sum = 146.6409784983356
At grid point (20, 13): total_weight = 2013.501923915667, weighted_sum = 108.27720618155766
At grid point (20, 14): total_weight = 1472.3688608705568, weighted_sum = 71.11291671256431
At grid point (20, 15): total_weight = 1081.7585474731147, weighted_sum = 38.14791947462803
At grid point (20, 16): total_weight = 811.3682257120054, weighted_sum = 9.13795675568337
At grid point (20, 17): total_weight = 601.5280712800261, weighted_sum = 1.163457133293344
At grid point (20, 18): total_weight = 449.31785032289304, weighted_sum = -3.346838327176427
At grid point (20, 19): total_weight = 341.7044032981991, weighted_sum = -1.446518000903229
At grid point (20, 20): total_weight = 269.2074924700169, weighted_sum = 0.2747278491121013
Processing dv grid point 22/41
At grid point (21, 0): total_weight = 12424.930114079383, weighted_sum = -2470.021637492195

At grid point (21, 1): total_weight = 17253.623931004637, weighted_sum = -3396.641861887553
At grid point (21, 2): total_weight = 21575.450546457705, weighted_sum = -3691.070942711201
At grid point (21, 3): total_weight = 22318.30799154196, weighted_sum = -2996.1110742703668
At grid point (21, 4): total_weight = 20346.75773559226, weighted_sum = -2124.963833013119
At grid point (21, 5): total_weight = 17360.565972259297, weighted_sum = -1418.0931624981372
At grid point (21, 6): total_weight = 13953.666692946128, weighted_sum = -920.5202699526955
At grid point (21, 7): total_weight = 10925.153845753064, weighted_sum = -543.2517103899578
At grid point (21, 8): total_weight = 8420.655292908608, weighted_sum = -23.3128662162192
At grid point (21, 9): total_weight = 6354.7153344244425, weighted_sum = -187.80281513548124
At grid point (21, 10): total_weight = 4761.126559118937, weighted_sum = -86.83522051858473
At grid point (21, 11): total_weight = 3559.9442153817595, weighted_sum = -22.921723579309063
At grid point (21, 12): total_weight = 2623.581060308497, weighted_sum = -7.831606507805537
At grid point (21, 13): total_weight = 1944.8725071934286, weighted_sum = -0.6912493745139147
At grid point (21, 14): total_weight = 1421.9565098657122, weighted_sum = -6.607565462194582
At grid point (21, 15): total_weight = 1044.9966303088393, weighted_sum = -16.847100145012753
At grid point (21, 16): total_weight = 784.4106392209852, weighted_sum = -29.180351260390143
At grid point (21, 17): total_weight = 580.9932672927043, weighted_sum = -26.216833590645543
At grid point (21, 18): total_weight = 432.5022368925526, weighted_sum = -23.101951402558736
At grid point (21, 19): total_weight = 327.31304802325315, weighted_sum = -16.094522632513115
At grid point (21, 20): total_weight = 256.4479064454287, weighted_sum = -10.869037641732167
Processing dv grid point 23/41
At grid point (22, 0): total_weight = 11344.8251432117, weighted_sum = -3191.3504582418304
At grid point (22, 1): total_weight = 15758.478517315276, weighted_sum = -4409.426032556657
At grid point (22, 2): total_weight = 19753.241900477948, weighted_sum = -5053.585438954702
At grid point (22, 3): total_weight = 20516.22780662711, weighted_sum = -4468.869247257158
At grid point (22, 4): total_weight = 18727.16999426245, weighted_sum = -3469.2111384226287
At grid point (22, 5): total_weight = 15957.85027210887, weighted_sum = -2536.1735387761887
At grid point (22, 6): total_weight = 12814.204431893813, weighted_sum = -

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1796.4464695059112
At grid point (22, 7): total_weight = 10030.485314611908, weighted_sum = -
1220.7757690348878
At grid point (22, 8): total_weight = 7723.686500892739, weighted_sum = -8
28.3010360354424
At grid point (22, 9): total_weight = 5820.014025178845, weighted_sum = -5
54.1715587440726
At grid point (22, 10): total_weight = 4353.686158147095, weighted_sum = -
354.8730028388321
At grid point (22, 11): total_weight = 3250.775263190007, weighted_sum = -
218.89702154169677
At grid point (22, 12): total_weight = 2399.7292773807053, weighted_sum =
-148.30283155341175
At grid point (22, 13): total_weight = 1780.2990262822648, weighted_sum =
-100.7411442270623
At grid point (22, 14): total_weight = 1301.4306387403406, weighted_sum =
-77.49611493172922
At grid point (22, 15): total_weight = 956.0162310715522, weighted_sum = -
66.077056206754
At grid point (22, 16): total_weight = 717.1821307855855, weighted_sum = -
62.176873489562425
At grid point (22, 17): total_weight = 529.9706248852234, weighted_sum = -
48.95608807265515
At grid point (22, 18): total_weight = 392.122238028175, weighted_sum = -3
8.44450109812784
At grid point (22, 19): total_weight = 294.33684183761125, weighted_sum =
-27.577763659785358
At grid point (22, 20): total_weight = 227.77592386394988, weighted_sum =
-19.653670901555685
Processing dv grid point 24/41
At grid point (23, 0): total_weight = 9839.651804086689, weighted_sum = -3
518.1811078383394
At grid point (23, 1): total_weight = 13672.997257391133, weighted_sum = -
4873.795931514822
At grid point (23, 2): total_weight = 17210.0161656042, weighted_sum = -57
67.953696300645
At grid point (23, 3): total_weight = 17985.24549454755, weighted_sum = -5
334.423510452577
At grid point (23, 4): total_weight = 16467.62006710203, weighted_sum = -4
302.901099467566
At grid point (23, 5): total_weight = 14027.931519315931, weighted_sum = -
3248.239576877457
At grid point (23, 6): total_weight = 11276.83666422685, weighted_sum = -2
364.1497093206394
At grid point (23, 7): total_weight = 8835.971777763032, weighted_sum = -1
669.6274594396311
At grid point (23, 8): total_weight = 6802.285747759303, weighted_sum = -1
166.7154355020969
At grid point (23, 9): total_weight = 5127.272194378056, weighted_sum = -8
01.5878681885409
At grid point (23, 10): total_weight = 3836.608884864225, weighted_sum = -
539.0350704681973
At grid point (23, 11): total_weight = 2866.8300385961033, weighted_sum =
-357.8790122424511
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At grid point (23, 12): total_weight = 2122.3877483259375, weighted_sum = -250.10764317137725
At grid point (23, 13): total_weight = 1575.3440477453678, weighted_sum = -175.16880618267965
At grid point (23, 14): total_weight = 1150.853390053041, weighted_sum = -130.4593661587579
At grid point (23, 15): total_weight = 844.2319350261312, weighted_sum = -102.8926711316921
At grid point (23, 16): total_weight = 631.7691379322775, weighted_sum = -86.89001651310697
At grid point (23, 17): total_weight = 465.68546676542604, weighted_sum = -66.07075715548349
At grid point (23, 18): total_weight = 342.8959390335173, weighted_sum = -50.037311745443056
At grid point (23, 19): total_weight = 255.6617753232492, weighted_sum = -36.29334908523153
At grid point (23, 20): total_weight = 195.72242664745784, weighted_sum = -26.30720660905223
Processing dv grid point 25/41
At grid point (24, 0): total_weight = 8250.742608294579, weighted_sum = -3514.3009685644865
At grid point (24, 1): total_weight = 11469.63299904815, weighted_sum = -4876.730901246404
At grid point (24, 2): total_weight = 14510.48922564229, weighted_sum = -5907.723940646181
At grid point (24, 3): total_weight = 15291.101087923656, weighted_sum = -5649.862702875853
At grid point (24, 4): total_weight = 14077.846740269599, weighted_sum = -4680.745333234519
At grid point (24, 5): total_weight = 12008.181050583244, weighted_sum = -3605.975464009755
At grid point (24, 6): total_weight = 9680.718573810445, weighted_sum = -2668.1693150505184
At grid point (24, 7): total_weight = 7606.08640668465, weighted_sum = -1919.3229781003886
At grid point (24, 8): total_weight = 5860.859083633646, weighted_sum = -1356.2327692243996
At grid point (24, 9): total_weight = 4425.983949539705, weighted_sum = -940.7141361729942
At grid point (24, 10): total_weight = 3320.2741173623826, weighted_sum = -643.5051403976212
At grid point (24, 11): total_weight = 2489.7426202116385, weighted_sum = -438.6668687110084
At grid point (24, 12): total_weight = 1852.0917037421736, weighted_sum = -309.3438812179761
At grid point (24, 13): total_weight = 1375.6871036674213, weighted_sum = -218.56793226845517
At grid point (24, 14): total_weight = 1004.0564107731602, weighted_sum = -161.29596378898816
At grid point (24, 15): total_weight = 735.1915573174313, weighted_sum = -123.8988198188563
At grid point (24, 16): total_weight = 548.3134848517612, weighted_sum = -100.34078214001093
At grid point (24, 17): total_weight = 403.01562053214826, weighted_sum =

-75.4276317464638
At grid point (24, 18): total_weight = 295.7244449788545, weighted_sum = -56.39982053996382
At grid point (24, 19): total_weight = 219.51091414063137, weighted_sum = -41.3108059046328
At grid point (24, 20): total_weight = 166.79129341251746, weighted_sum = -30.345047943794537
Processing dv grid point 26/41
At grid point (25, 0): total_weight = 6747.246233987544, weighted_sum = -3276.819299029418
At grid point (25, 1): total_weight = 9381.766009934585, weighted_sum = -4551.864181678964
At grid point (25, 2): total_weight = 11940.129922437613, weighted_sum = -5616.352003237129
At grid point (25, 3): total_weight = 12709.873322066249, weighted_sum = -5536.349149798753
At grid point (25, 4): total_weight = 11811.795059112912, weighted_sum = -4719.104664403706
At grid point (25, 5): total_weight = 10129.27293047929, weighted_sum = -3715.576460559455
At grid point (25, 6): total_weight = 8207.462498560848, weighted_sum = -2791.275408936295
At grid point (25, 7): total_weight = 6472.8931086566445, weighted_sum = -2034.1604896525332
At grid point (25, 8): total_weight = 4992.396164770648, weighted_sum = -1447.4259913997566
At grid point (25, 9): total_weight = 3778.4772501109014, weighted_sum = -1009.9092106355566
At grid point (25, 10): total_weight = 2845.5609482424475, weighted_sum = -696.5806596507167
At grid point (25, 11): total_weight = 2144.666948166191, weighted_sum = -481.9135913592318
At grid point (25, 12): total_weight = 1605.7588042258371, weighted_sum = -342.45388482929025
At grid point (25, 13): total_weight = 1193.0422602870271, weighted_sum = -243.77812824428156
At grid point (25, 14): total_weight = 869.7286178008712, weighted_sum = -178.7675261074268
At grid point (25, 15): total_weight = 635.4903130511938, weighted_sum = -135.2804747712974
At grid point (25, 16): total_weight = 472.06261266500553, weighted_sum = -106.82205950614409
At grid point (25, 17): total_weight = 346.182180550163, weighted_sum = -79.91708945705801
At grid point (25, 18): total_weight = 253.50166882349052, weighted_sum = -59.54258439060609
At grid point (25, 19): total_weight = 187.74211846647893, weighted_sum = -44.12753044515805
At grid point (25, 20): total_weight = 142.04107234784908, weighted_sum = -32.89723505428538
Processing dv grid point 27/41
At grid point (26, 0): total_weight = 5400.930968636572, weighted_sum = -2899.696765400468
At grid point (26, 1): total_weight = 7510.776968810487, weighted_sum = -4

031.1875090502385
At grid point (26, 2): total_weight = 9613.61749952631, weighted_sum = -50
48.9214214542235
At grid point (26, 3): total_weight = 10346.426718103656, weighted_sum = -
5116.407463246707
At grid point (26, 4): total_weight = 9734.40336620915, weighted_sum = -44
95.470958937088
At grid point (26, 5): total_weight = 8421.052668381833, weighted_sum = -3
617.893829759618
At grid point (26, 6): total_weight = 6868.56023242384, weighted_sum = -27
50.0369325871093
At grid point (26, 7): total_weight = 5435.798602044594, weighted_sum = -2
014.7897929026071
At grid point (26, 8): total_weight = 4196.449561495676, weighted_sum = -1
436.6820080969017
At grid point (26, 9): total_weight = 3184.6265110654986, weighted_sum = -
1004.0934292611221
At grid point (26, 10): total_weight = 2409.8080486347526, weighted_sum = -
693.8136590771238
At grid point (26, 11): total_weight = 1825.7957848220426, weighted_sum = -
482.4389595946807
At grid point (26, 12): total_weight = 1373.089218998542, weighted_sum = -
342.7646743806825
At grid point (26, 13): total_weight = 1019.3234279139425, weighted_sum = -
244.1830353953756
At grid point (26, 14): total_weight = 743.0157924751941, weighted_sum = -
178.82498125145133
At grid point (26, 15): total_weight = 542.3127796541319, weighted_sum = -
134.6199121135423
At grid point (26, 16): total_weight = 401.92468921201555, weighted_sum = -
105.26660028158042
At grid point (26, 17): total_weight = 294.4948731464438, weighted_sum = -
78.90451353102614
At grid point (26, 18): total_weight = 215.5085867592529, weighted_sum = -
58.95635031579756
At grid point (26, 19): total_weight = 159.59183715744064, weighted_sum = -
44.37745990060897
At grid point (26, 20): total_weight = 120.59232953181859, weighted_sum = -
33.67131696940046
Processing dv grid point 28/41
At grid point (27, 0): total_weight = 4248.67960446123, weighted_sum = -24
79.231201189094
At grid point (27, 1): total_weight = 5908.83654535961, weighted_sum = -34
49.2424596914966
At grid point (27, 2): total_weight = 7603.130576275861, weighted_sum = -4
376.943528581152
At grid point (27, 3): total_weight = 8276.737747031579, weighted_sum = -4
553.077845780141
At grid point (27, 4): total_weight = 7884.361844898756, weighted_sum = -4
106.713325261151
At grid point (27, 5): total_weight = 6885.4841841370335, weighted_sum = -
3376.027603377482
At grid point (27, 6): total_weight = 5647.267058673768, weighted_sum = -2
594.7343447560033

At grid point (27, 7): total_weight = 4483.681371215525, weighted_sum = -1911.1797777835081
At grid point (27, 8): total_weight = 3468.2550391658706, weighted_sum = -1368.4985132096108
At grid point (27, 9): total_weight = 2639.192555321805, weighted_sum = -959.3987266771371
At grid point (27, 10): total_weight = 2004.6439354980664, weighted_sum = -664.4043183249578
At grid point (27, 11): total_weight = 1521.6111190576355, weighted_sum = -464.2095061148007
At grid point (27, 12): total_weight = 1144.7983958158532, weighted_sum = -330.5680983677235
At grid point (27, 13): total_weight = 849.0410500095887, weighted_sum = -236.08270367618877
At grid point (27, 14): total_weight = 619.7254346055524, weighted_sum = -173.10761185800723
At grid point (27, 15): total_weight = 452.2754988067315, weighted_sum = -130.03602494714625
At grid point (27, 16): total_weight = 334.94066032411354, weighted_sum = -101.17186256846298
At grid point (27, 17): total_weight = 245.51078319123994, weighted_sum = -76.07411659158164
At grid point (27, 18): total_weight = 179.70556797951352, weighted_sum = -56.9631337160987
At grid point (27, 19): total_weight = 133.24088803304912, weighted_sum = -43.33414347142311
At grid point (27, 20): total_weight = 100.78490810839124, weighted_sum = -33.291953702156405
Processing dv grid point 29/41
At grid point (28, 0): total_weight = 3306.355331050464, weighted_sum = -2058.4787145169603
At grid point (28, 1): total_weight = 4598.398149132006, weighted_sum = -2865.5362719623936
At grid point (28, 2): total_weight = 5944.261968307819, weighted_sum = -3676.9022535078075
At grid point (28, 3): total_weight = 6547.550554436893, weighted_sum = -3920.9834936236516
At grid point (28, 4): total_weight = 6316.474556381851, weighted_sum = -3624.5746410843135
At grid point (28, 5): total_weight = 5576.117720101531, weighted_sum = -3046.857051837668
At grid point (28, 6): total_weight = 4602.051359655742, weighted_sum = -2371.0442368347417
At grid point (28, 7): total_weight = 3666.104580337, weighted_sum = -1754.4546897282203
At grid point (28, 8): total_weight = 2845.814372762835, weighted_sum = -1263.2871724819956
At grid point (28, 9): total_weight = 2173.3942997721056, weighted_sum = -888.8417183639552
At grid point (28, 10): total_weight = 1655.4229530032442, weighted_sum = -616.6475481326538
At grid point (28, 11): total_weight = 1256.1238290012882, weighted_sum = -432.62331612011053
At grid point (28, 12): total_weight = 944.4723091172536, weighted_sum = -

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309.6596529017454
At grid point (28, 13): total_weight = 701.1908297004445, weighted_sum = -
222.2391825176965
At grid point (28, 14): total_weight = 513.2138241129109, weighted_sum = -
163.58261441516885
At grid point (28, 15): total_weight = 374.6419515431877, weighted_sum = -
122.745604111245
At grid point (28, 16): total_weight = 277.30853145389443, weighted_sum =
-95.12607710471002
At grid point (28, 17): total_weight = 203.3475766865403, weighted_sum = -
71.51149102798153
At grid point (28, 18): total_weight = 148.72296691410867, weighted_sum =
-53.170288974625166
At grid point (28, 19): total_weight = 110.15937411159334, weighted_sum =
-40.120372736584585
At grid point (28, 20): total_weight = 83.2567403167669, weighted_sum = -3
0.648809028158
Processing dv grid point 30/41
At grid point (29, 0): total_weight = 2529.5058910588436, weighted_sum = -
1639.0572125266426
At grid point (29, 1): total_weight = 3518.160352383612, weighted_sum = -2
282.2044957751173
At grid point (29, 2): total_weight = 4563.702888427064, weighted_sum = -2
950.5315244004605
At grid point (29, 3): total_weight = 5083.719724616957, weighted_sum = -3
214.4299384402975
At grid point (29, 4): total_weight = 4965.865001733023, weighted_sum = -3
039.829490650771
At grid point (29, 5): total_weight = 4431.627109618519, weighted_sum = -2
606.094527405918
At grid point (29, 6): total_weight = 3688.983914624897, weighted_sum = -2
055.037967983388
At grid point (29, 7): total_weight = 2953.8455878751847, weighted_sum = -
1524.6281836350518
At grid point (29, 8): total_weight = 2306.024418492188, weighted_sum = -1
102.13156378625
At grid point (29, 9): total_weight = 1770.3907916960163, weighted_sum = -
775.7763400711168
At grid point (29, 10): total_weight = 1352.25432726292, weighted_sum = -5
36.8012132943497
At grid point (29, 11): total_weight = 1027.39108078026, weighted_sum = -3
77.3096102213301
At grid point (29, 12): total_weight = 773.2523007056017, weighted_sum = -
271.3384049219377
At grid point (29, 13): total_weight = 575.9857502057467, weighted_sum = -
195.90128493991892
At grid point (29, 14): total_weight = 423.16531144156215, weighted_sum =
-144.99080382054905
At grid point (29, 15): total_weight = 308.97563732340825, weighted_sum =
-108.96670245562568
At grid point (29, 16): total_weight = 228.632772363636, weighted_sum = -8
4.5528664559962
At grid point (29, 17): total_weight = 167.83576907275906, weighted_sum =
-63.801171305487635
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At grid point (29, 18): total_weight = 122.7252850881884, weighted_sum = -47.29620084570547
At grid point (29, 19): total_weight = 90.88609731376509, weighted_sum = -35.58311441933202
At grid point (29, 20): total_weight = 68.71383542639455, weighted_sum = -27.19796015825
Processing dv grid point 31/41
At grid point (30, 0): total_weight = 1908.0128494351216, weighted_sum = -1274.2953638745555
At grid point (30, 1): total_weight = 2654.016103199892, weighted_sum = -1774.5243990763647
At grid point (30, 2): total_weight = 3451.189173634967, weighted_sum = -2306.335078615838
At grid point (30, 3): total_weight = 3878.1732562992365, weighted_sum = -2551.1838053112842
At grid point (30, 4): total_weight = 3834.351418156032, weighted_sum = -2464.2996241070955
At grid point (30, 5): total_weight = 3465.676565162412, weighted_sum = -2157.3209702364993
At grid point (30, 6): total_weight = 2920.2047958966955, weighted_sum = -1729.8614616410066
At grid point (30, 7): total_weight = 2356.8421765444305, weighted_sum = -1292.397852379901
At grid point (30, 8): total_weight = 1853.5241832136185, weighted_sum = -942.3255082036534
At grid point (30, 9): total_weight = 1431.1319927863658, weighted_sum = -665.0183582087215
At grid point (30, 10): total_weight = 1095.6325731696074, weighted_sum = -460.3182906108871
At grid point (30, 11): total_weight = 835.3299550667979, weighted_sum = -324.1646262393054
At grid point (30, 12): total_weight = 630.8215834971442, weighted_sum = -234.05602347049503
At grid point (30, 13): total_weight = 472.144610191176, weighted_sum = -69.28223400114814
At grid point (30, 14): total_weight = 347.94749162243994, weighted_sum = -125.07783915486172
At grid point (30, 15): total_weight = 254.06521358022232, weighted_sum = -93.8566639938732
At grid point (30, 16): total_weight = 188.06970725200657, weighted_sum = -72.70688398224915
At grid point (30, 17): total_weight = 138.34869403351706, weighted_sum = -55.030583874759685
At grid point (30, 18): total_weight = 101.20394515398574, weighted_sum = -40.76121917288448
At grid point (30, 19): total_weight = 74.98763828911137, weighted_sum = -30.6527941216892
At grid point (30, 20): total_weight = 56.763770721439336, weighted_sum = -23.50350719327043
Processing dv grid point 32/41
At grid point (31, 0): total_weight = 1427.7573230514738, weighted_sum = -984.2071939381041
At grid point (31, 1): total_weight = 1986.2556080314632, weighted_sum = -1370.7782419270072

At grid point (31, 2): total_weight = 2589.0135047457898, weighted_sum = -1790.4524355310411
At grid point (31, 3): total_weight = 2931.6031877162336, weighted_sum = -2005.2215024320376
At grid point (31, 4): total_weight = 2934.3344774257116, weighted_sum = -1978.0634184587973
At grid point (31, 5): total_weight = 2685.5584723642546, weighted_sum = -1766.8852162466546
At grid point (31, 6): total_weight = 2290.650560775206, weighted_sum = -1440.1916759474539
At grid point (31, 7): total_weight = 1863.4388184849522, weighted_sum = -1087.0120175350523
At grid point (31, 8): total_weight = 1476.3380980434306, weighted_sum = -802.5559169090212
At grid point (31, 9): total_weight = 1145.9138592001934, weighted_sum = -569.1219390061566
At grid point (31, 10): total_weight = 879.7244372267965, weighted_sum = -396.1985808068082
At grid point (31, 11): total_weight = 673.0619084772931, weighted_sum = -279.96381528104394
At grid point (31, 12): total_weight = 510.2359688365054, weighted_sum = -203.29563161764082
At grid point (31, 13): total_weight = 383.7515197622681, weighted_sum = -147.7899890361726
At grid point (31, 14): total_weight = 283.5630603733114, weighted_sum = -109.36126672768725
At grid point (31, 15): total_weight = 207.20538383499954, weighted_sum = -81.7311075987323
At grid point (31, 16): total_weight = 153.65095550540218, weighted_sum = -62.94124505281067
At grid point (31, 17): total_weight = 113.47103501698678, weighted_sum = -47.706536312006634
At grid point (31, 18): total_weight = 83.12691442910193, weighted_sum = -35.350187175069486
At grid point (31, 19): total_weight = 61.707432853534115, weighted_sum = -26.603878581863015
At grid point (31, 20): total_weight = 46.85276587850098, weighted_sum = -20.493110690254074
Processing dv grid point 33/41
At grid point (32, 0): total_weight = 1055.9147793179002, weighted_sum = -744.2177887522865
At grid point (32, 1): total_weight = 1469.1047967539525, weighted_sum = -1036.6379292086679
At grid point (32, 2): total_weight = 1918.3714524736033, weighted_sum = -1358.7818651869939
At grid point (32, 3): total_weight = 2185.90927645074, weighted_sum = -1538.6265868885273
At grid point (32, 4): total_weight = 2210.461454894511, weighted_sum = -1544.3604478064785
At grid point (32, 5): total_weight = 2045.3192346283513, weighted_sum = -1406.5122410529193
At grid point (32, 6): total_weight = 1763.8995812370324, weighted_sum = -1166.1413275727687
At grid point (32, 7): total_weight = 1446.4240130687976, weighted_sum = -

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890.9124482674956
At grid point (32, 8): total_weight = 1155.8061638025208, weighted_sum = -
665.8067826463787
At grid point (32, 9): total_weight = 904.0441697498288, weighted_sum = -4
75.84395270595456
At grid point (32, 10): total_weight = 697.690208806001, weighted_sum = -3
34.97360080871954
At grid point (32, 11): total_weight = 536.3576481129942, weighted_sum = -
238.60697784171603
At grid point (32, 12): total_weight = 408.2640327555133, weighted_sum = -
175.04452607692178
At grid point (32, 13): total_weight = 308.39448406337533, weighted_sum =
-128.64482462845785
At grid point (32, 14): total_weight = 228.86182214180008, weighted_sum =
-95.905615747203
At grid point (32, 15): total_weight = 167.52341306789407, weighted_sum =
-71.4093572152603
At grid point (32, 16): total_weight = 124.66106209311808, weighted_sum =
-54.68809794632748
At grid point (32, 17): total_weight = 92.67575604520114, weighted_sum = -
41.59718132606552
At grid point (32, 18): total_weight = 68.14480968099903, weighted_sum = -
30.91855088138984
At grid point (32, 19): total_weight = 50.83719609402575, weighted_sum = -
23.36916675817309
At grid point (32, 20): total_weight = 38.897192040590674, weighted_sum =
-18.184016979451048
Processing dv grid point 34/41
At grid point (33, 0): total_weight = 776.7087720730494, weighted_sum = -5
54.8593554764017
At grid point (33, 1): total_weight = 1080.7292190489436, weighted_sum = -
772.9343559322203
At grid point (33, 2): total_weight = 1413.3112834341252, weighted_sum = -
1015.8700882363687
At grid point (33, 3): total_weight = 1618.98927059575, weighted_sum = -11
60.691305334851
At grid point (33, 4): total_weight = 1650.7320256022924, weighted_sum = -
1178.8406897919378
At grid point (33, 5): total_weight = 1541.9525181955792, weighted_sum = -
1091.7543514289189
At grid point (33, 6): total_weight = 1343.0946750018534, weighted_sum = -
919.5819763734875
At grid point (33, 7): total_weight = 1112.7692506795868, weighted_sum = -
713.8862608094411
At grid point (33, 8): total_weight = 899.2527072036517, weighted_sum = -5
41.7911326373343
At grid point (33, 9): total_weight = 710.4699057979394, weighted_sum = -3
92.2511395333415
At grid point (33, 10): total_weight = 552.1120627185564, weighted_sum = -
280.0399394314449
At grid point (33, 11): total_weight = 426.47232974813153, weighted_sum =
-201.26836214425535
At grid point (33, 12): total_weight = 325.06261458849724, weighted_sum =
-148.60725002921043
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At grid point (33, 13): total_weight = 245.16176610816194, weighted_sum = -109.23846148976814
At grid point (33, 14): total_weight = 182.1181500666376, weighted_sum = -81.54676085167462
At grid point (33, 15): total_weight = 133.735255489146, weighted_sum = -60.70641562543859
At grid point (33, 16): total_weight = 100.12734643457664, weighted_sum = -46.50688199427025
At grid point (33, 17): total_weight = 75.24742941364924, weighted_sum = -35.756590337767705
At grid point (33, 18): total_weight = 55.73549687698306, weighted_sum = -26.744998610291493
At grid point (33, 19): total_weight = 41.987160959216325, weighted_sum = -20.37288844164163
At grid point (33, 20): total_weight = 32.59838661711314, weighted_sum = -16.091683433226116
Processing dv grid point 35/41
At grid point (34, 0): total_weight = 570.2604213124172, weighted_sum = -413.32247791832316
At grid point (34, 1): total_weight = 793.5300811459284, weighted_sum = -575.810297317398
At grid point (34, 2): total_weight = 1039.061141410176, weighted_sum = -758.7193520416608
At grid point (34, 3): total_weight = 1196.0485120643145, weighted_sum = -874.3541639095608
At grid point (34, 4): total_weight = 1229.2710661597348, weighted_sum = -898.5132713916602
At grid point (34, 5): total_weight = 1160.905765709646, weighted_sum = -846.4905364340943
At grid point (34, 6): total_weight = 1022.5419988790235, weighted_sum = -725.9415098567188
At grid point (34, 7): total_weight = 856.7165613739473, weighted_sum = -573.3331265656844
At grid point (34, 8): total_weight = 700.6883361875559, weighted_sum = -440.77638599035237
At grid point (34, 9): total_weight = 560.2457418469631, weighted_sum = -324.02078691373873
At grid point (34, 10): total_weight = 439.00266051118786, weighted_sum = -235.08932559577505
At grid point (34, 11): total_weight = 340.3738128134804, weighted_sum = -170.39786881647623
At grid point (34, 12): total_weight = 259.28936263481506, weighted_sum = -125.94794487171689
At grid point (34, 13): total_weight = 195.03246978780146, weighted_sum = -92.40607081843093
At grid point (34, 14): total_weight = 144.92741350476157, weighted_sum = -68.91017584904006
At grid point (34, 15): total_weight = 106.94591223188885, weighted_sum = -51.49868707441983
At grid point (34, 16): total_weight = 80.79823550635567, weighted_sum = -39.742769339409534
At grid point (34, 17): total_weight = 61.70491792695287, weighted_sum = -31.201658633441326
At grid point (34, 18): total_weight = 46.264458238398426, weighted_sum =


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-23.59151714381363
At grid point (34, 19): total_weight = 35.40277757911558, weighted_sum = -
18.205137405094103
At grid point (34, 20): total_weight = 28.107547043796245, weighted_sum =
-14.70751582712262
Processing dv grid point 36/41
At grid point (35, 0): total_weight = 418.0982134892694, weighted_sum = -3
06.65493879647136
At grid point (35, 1): total_weight = 581.8317893627117, weighted_sum = -4
27.2350718587695
At grid point (35, 2): total_weight = 762.8946378035656, weighted_sum = -5
64.132492285876
At grid point (35, 3): total_weight = 882.3916109737883, weighted_sum = -6
54.9112866008408
At grid point (35, 4): total_weight = 914.0554901566662, weighted_sum = -6
80.8090317520592
At grid point (35, 5): total_weight = 873.4874280784319, weighted_sum = -6
53.2383296660012
At grid point (35, 6): total_weight = 779.7634170103613, weighted_sum = -5
72.9493147809055
At grid point (35, 7): total_weight = 661.5213862349464, weighted_sum = -4
60.916695558713
At grid point (35, 8): total_weight = 547.042358884362, weighted_sum = -35
7.3650472526913
At grid point (35, 9): total_weight = 442.90041799694427, weighted_sum = -
267.4747722499721
At grid point (35, 10): total_weight = 350.1481088476028, weighted_sum = -
198.5338919836876
At grid point (35, 11): total_weight = 272.0986718116662, weighted_sum = -
146.0104775609997
At grid point (35, 12): total_weight = 207.06320685970516, weighted_sum =
-108.63987188746033
At grid point (35, 13): total_weight = 155.44120514683487, weighted_sum =
-79.78192598214407
At grid point (35, 14): total_weight = 115.68901653977046, weighted_sum =
-59.619984258887634
At grid point (35, 15): total_weight = 85.95196364059923, weighted_sum = -
44.966475255687904
At grid point (35, 16): total_weight = 65.73960576514033, weighted_sum = -
35.26991735457173
At grid point (35, 17): total_weight = 51.33305525600311, weighted_sum = -
28.648892833490404
At grid point (35, 18): total_weight = 39.248328168799276, weighted_sum =
-22.034416990738457
At grid point (35, 19): total_weight = 30.76451463706185, weighted_sum = -
17.35969615544481
At grid point (35, 20): total_weight = 25.227007004409682, weighted_sum =
-14.5027358698448
Processing dv grid point 37/41
At grid point (36, 0): total_weight = 305.05799449301537, weighted_sum = -
225.25219575536028
At grid point (36, 1): total_weight = 424.5452085625833, weighted_sum = -3
13.837130339686
At grid point (36, 2): total_weight = 557.3066733730956, weighted_sum = -4
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14.9785207315181
At grid point (36, 3): total_weight = 647.1476472826133, weighted_sum = -4
84.2750181712498
At grid point (36, 4): total_weight = 675.2687514662598, weighted_sum = -5
08.49654031146065
At grid point (36, 5): total_weight = 652.8768933196546, weighted_sum = -4
95.90631315710306
At grid point (36, 6): total_weight = 592.0224476418261, weighted_sum = -4
45.01225366337496
At grid point (36, 7): total_weight = 510.03595913599264, weighted_sum = -
364.6227152530518
At grid point (36, 8): total_weight = 426.3192436707402, weighted_sum = -2
83.09809416124773
At grid point (36, 9): total_weight = 348.05218401808304, weighted_sum = -
213.2752759066491
At grid point (36, 10): total_weight = 277.040984597653, weighted_sum = -1
60.04109154238452
At grid point (36, 11): total_weight = 215.2966190240775, weighted_sum = -
118.88466998692309
At grid point (36, 12): total_weight = 163.48256712095392, weighted_sum =
-88.68066145638839
At grid point (36, 13): total_weight = 122.66285078819199, weighted_sum =
-65.42943775705993
At grid point (36, 14): total_weight = 91.6136975202675, weighted_sum = -4
9.335838300661564
At grid point (36, 15): total_weight = 68.71847200936404, weighted_sum = -
37.931174670287085
At grid point (36, 16): total_weight = 53.44770798601452, weighted_sum = -
30.718806794203125
At grid point (36, 17): total_weight = 42.998374464438875, weighted_sum =
-26.312421449047932
At grid point (36, 18): total_weight = 33.87931886825953, weighted_sum = -
20.56326483846926
At grid point (36, 19): total_weight = 27.478250018254585, weighted_sum =
-16.41991677517151
At grid point (36, 20): total_weight = 23.498469509203666, weighted_sum =
-13.998283365029613
Processing dv grid point 38/41
At grid point (37, 0): total_weight = 221.5381728825676, weighted_sum = -1
64.408641940884
At grid point (37, 1): total_weight = 308.32336690194063, weighted_sum = -
229.07267803787752
At grid point (37, 2): total_weight = 405.082394293683, weighted_sum = -30
3.20464869745143
At grid point (37, 3): total_weight = 471.732901128948, weighted_sum = -35
5.17586778289416
At grid point (37, 4): total_weight = 495.05985433249225, weighted_sum = -
375.7665284489026
At grid point (37, 5): total_weight = 483.259453318669, weighted_sum = -37
0.7535698255124
At grid point (37, 6): total_weight = 444.3516790409218, weighted_sum = -3
38.73811470542273
At grid point (37, 7): total_weight = 388.7513341188512, weighted_sum = -2
82.75335898052697
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At grid point (37, 8): total_weight = 327.9343696051622, weighted_sum = -20.29128792633415
At grid point (37, 9): total_weight = 268.97320002552306, weighted_sum = -165.68468950187284
At grid point (37, 10): total_weight = 215.22318245959937, weighted_sum = -124.40533805741295
At grid point (37, 11): total_weight = 166.98361163008587, weighted_sum = -92.67189906709466
At grid point (37, 12): total_weight = 126.55794404194275, weighted_sum = -69.32010461858988
At grid point (37, 13): total_weight = 95.06618315726546, weighted_sum = -51.59812366214541
At grid point (37, 14): total_weight = 71.37990176042936, weighted_sum = -39.533661307730064
At grid point (37, 15): total_weight = 54.17940107647408, weighted_sum = -31.298064234907915
At grid point (37, 16): total_weight = 42.99610789341048, weighted_sum = -26.5283196806248
At grid point (37, 17): total_weight = 35.79087447711968, weighted_sum = -24.273513120673947
At grid point (37, 18): total_weight = 29.229229913169448, weighted_sum = -19.056062900781445
At grid point (37, 19): total_weight = 24.4619992054041, weighted_sum = -15.027905289587345
At grid point (37, 20): total_weight = 21.547279509690515, weighted_sum = -12.561280506444293
Processing dv grid point 39/41
At grid point (38, 0): total_weight = 161.10226899311292, weighted_sum = -120.116497186208
At grid point (38, 1): total_weight = 224.22150160055344, weighted_sum = -167.36518020113553
At grid point (38, 2): total_weight = 294.8571655768744, weighted_sum = -21.75987128084873
At grid point (38, 3): total_weight = 344.4353234977667, weighted_sum = -260.7808130742557
At grid point (38, 4): total_weight = 363.69120222041937, weighted_sum = -278.02155826684043
At grid point (38, 5): total_weight = 358.62853863962624, weighted_sum = -277.3150095923214
At grid point (38, 6): total_weight = 334.7223350269131, weighted_sum = -257.3992230763033
At grid point (38, 7): total_weight = 298.068888389662, weighted_sum = -219.6222787719033
At grid point (38, 8): total_weight = 254.36548707324516, weighted_sum = -172.89706756706806
At grid point (38, 9): total_weight = 209.8949131702853, weighted_sum = -129.83727743155686
At grid point (38, 10): total_weight = 168.85606576958725, weighted_sum = -96.9282717094745
At grid point (38, 11): total_weight = 130.50268469494299, weighted_sum = -72.11007413241852
At grid point (38, 12): total_weight = 98.77110004413845, weighted_sum = -54.12249809155379
At grid point (38, 13): total_weight = 74.34799935944305, weighted_sum = -

40.66817660971089
At grid point (38, 14): total_weight = 56.216436095387266, weighted_sum = -31.682184275183953
At grid point (38, 15): total_weight = 43.300762769809104, weighted_sum = -25.81594479343137
At grid point (38, 16): total_weight = 35.19895774555472, weighted_sum = -22.813253411399497
At grid point (38, 17): total_weight = 30.43996905166371, weighted_sum = -22.039287498898574
At grid point (38, 18): total_weight = 25.985699707114698, weighted_sum = -17.651960959626276
At grid point (38, 19): total_weight = 22.397237146121817, weighted_sum = -13.955276538201089
At grid point (38, 20): total_weight = 20.09931985556972, weighted_sum = -11.681881812627084
Processing dv grid point 40/41
At grid point (39, 0): total_weight = 116.91306316681873, weighted_sum = -88.17305114195388
At grid point (39, 1): total_weight = 162.72478101803827, weighted_sum = -122.86130045918961
At grid point (39, 2): total_weight = 214.15361594050555, weighted_sum = -162.99946848348682
At grid point (39, 3): total_weight = 250.81697546056873, weighted_sum = -192.5818299817291
At grid point (39, 4): total_weight = 266.20409764867503, weighted_sum = -207.19993320676912
At grid point (39, 5): total_weight = 264.5807839164461, weighted_sum = -209.03633194806542
At grid point (39, 6): total_weight = 249.40839753352049, weighted_sum = -196.97952046983332
At grid point (39, 7): total_weight = 226.0495453327821, weighted_sum = -173.3169142839198
At grid point (39, 8): total_weight = 195.62566768365508, weighted_sum = -138.7770392840739
At grid point (39, 9): total_weight = 163.18911403458625, weighted_sum = -103.96699576409114
At grid point (39, 10): total_weight = 131.9890281221653, weighted_sum = -77.03035599249239
At grid point (39, 11): total_weight = 101.67958998825371, weighted_sum = -57.35859856484107
At grid point (39, 12): total_weight = 77.01609294999697, weighted_sum = -43.23401546160596
At grid point (39, 13): total_weight = 58.289523726028534, weighted_sum = -32.8570890317233
At grid point (39, 14): total_weight = 44.63364683878569, weighted_sum = -26.09870613739562
At grid point (39, 15): total_weight = 35.20325880226177, weighted_sum = -21.956724236137397
At grid point (39, 16): total_weight = 29.69057202769731, weighted_sum = -20.254446005054326
At grid point (39, 17): total_weight = 27.07433490468055, weighted_sum = -20.587381071294296
At grid point (39, 18): total_weight = 24.45916139787091, weighted_sum = -17.059462873858354

```

At grid point (39, 19): total_weight = 21.76053007733118, weighted_sum = -
13.773118583287545
At grid point (39, 20): total_weight = 19.813679750071667, weighted_sum =
-11.855790009111898
Processing dv grid point 41/41
At grid point (40, 0): total_weight = 85.01085127990257, weighted_sum = -6
4.86321784560951
At grid point (40, 1): total_weight = 118.32653775224888, weighted_sum = -
90.38483025126965
At grid point (40, 2): total_weight = 155.8609763803804, weighted_sum = -1
20.07511445408169
At grid point (40, 3): total_weight = 183.08611542292223, weighted_sum = -
142.56976422176905
At grid point (40, 4): total_weight = 195.44385305272385, weighted_sum = -
154.8555440992138
At grid point (40, 5): total_weight = 196.0078112389182, weighted_sum = -1
58.40528043569907
At grid point (40, 6): total_weight = 187.03758488746723, weighted_sum = -
152.26665465305143
At grid point (40, 7): total_weight = 172.99715594036726, weighted_sum = -
138.74588805552364
At grid point (40, 8): total_weight = 152.77170332499475, weighted_sum = -
114.18597093393718
At grid point (40, 9): total_weight = 129.31511756968425, weighted_sum = -
85.55789535534493
At grid point (40, 10): total_weight = 104.81886255080295, weighted_sum =
-63.10850488339979
At grid point (40, 11): total_weight = 80.54998173267927, weighted_sum = -
46.97329398437244
At grid point (40, 12): total_weight = 61.189357947426544, weighted_sum =
-35.47154645059071
At grid point (40, 13): total_weight = 46.75614253452123, weighted_sum = -
27.158976389179735
At grid point (40, 14): total_weight = 36.515820025069246, weighted_sum =
-21.84470024754188
At grid point (40, 15): total_weight = 29.811698767426726, weighted_sum =
-18.75775520146568
At grid point (40, 16): total_weight = 26.429188210626695, weighted_sum =
-17.758177413282457
At grid point (40, 17): total_weight = 25.70017140785522, weighted_sum = -
18.580826191288615
At grid point (40, 18): total_weight = 24.804180435308325, weighted_sum =
-16.12124835045275
At grid point (40, 19): total_weight = 22.79482139551391, weighted_sum = -
13.3932780696712
At grid point (40, 20): total_weight = 20.996513444189674, weighted_sum =
-11.938193467596482
Finished

```

The following code will plot the data for you. Does it make sense when considering:

- Negative (slower than leader) and positive (faster than leader) speed differences?

- Small and large headways?

```
In [ ]: X, Y = np.meshgrid(dv, s)
        axs = plt.axes()
        p = axs.pcolor(X, Y, a.T, shading='nearest')
        axs.set_title('Acceleration [m/s/s]')
        axs.set_xlabel('Speed difference [m/s]')
        axs.set_ylabel('Headway [m]')
        axs.figure.colorbar(p)
        axs.figure.set_size_inches(10, 7)
```

