

rendering

March 6, 2021

```
[1]: import numpy as np
import matplotlib.pyplot as plt
import matplotlib.colors as colors
import torch
from bbobtorch import *
```

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[2]: STEP_SIZE = 0.01
FIG_SIZE = (8,8)
CMAP = 'inferno'
ALPHA = 1
SHADING = 'nearest'
MARKER_T = 'x'
MARKER_C = 'r'
```

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[3]: a = torch.arange(-5,5+STEP_SIZE,STEP_SIZE, dtype=t.float32)
b = torch.arange(-5,5+STEP_SIZE,STEP_SIZE, dtype=t.float32)
grid = torch.stack(torch.meshgrid(a, b), -1)
flat_grid = torch.reshape(grid, (-1,2))
agrid, bgrid = np.meshgrid(a.numpy(), b.numpy())
```

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[4]: create_fn = [
    create_f01,
    create_f02,
    create_f03,
    create_f04,
    create_f05,
    create_f06,
    create_f07,
    create_f08,
    create_f09,
    create_f10,
    create_f11,
    create_f12,
    create_f13,
    create_f14,
    create_f15,
    create_f16,
    create_f17,
```

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        create_f18,
        create_f19,
        create_f20,
        create_f21,
        create_f22,
        create_f23,
        create_f24,
    ]

name_fn = [
    'f01',
    'f02',
    'f03',
    'f04',
    'f05',
    'f06',
    'f07',
    'f08',
    'f09',
    'f10',
    'f11',
    'f12',
    'f13',
    'f14',
    'f15',
    'f16',
    'f17',
    'f18',
    'f19',
    'f20',
    'f21',
    'f22',
    'f23',
    'f24',
]

```

```

[5]: for cr, name in zip(create_fn, name_fn):
    fn = cr(2, seed=42)
    results = torch.reshape(fn(flat_grid), grid.shape[:-1]) - fn.f_opt

    plt.figure(figsize=FIG_SIZE)
    plt.pcolormesh(a, b, results, cmap=CMAP, alpha=ALPHA, shading=SHADING)
    plt.scatter(*fn.x_opt.tolist()[:-1], marker=MARKER_T, c=MARKER_C)
    plt.title(name)
    plt.show()

    plt.figure(figsize=FIG_SIZE)

```

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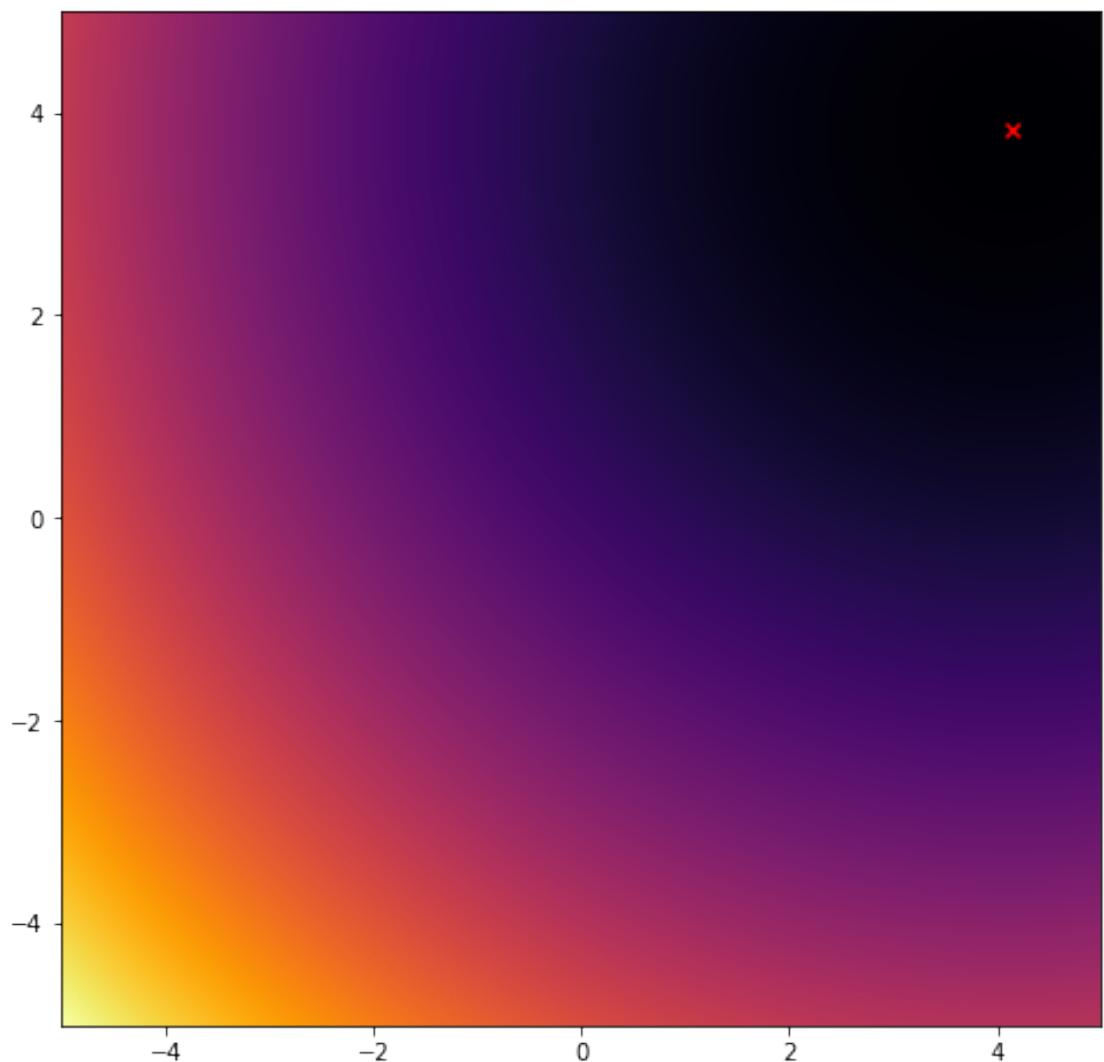
tmpresults = results - results.min() + 1
plt.pcolormesh(a, b, tmpresults, cmap=CMAP, alpha=ALPHA, u
˓→shading=SHADING, norm=colors.LogNorm(tmpresults.min(), tmpresults.max()))
plt.scatter(*fn.x_opt.tolist()[:-1], marker=MARKER_T, c=MARKER_C)
plt.title("Log " + name)
plt.show()

fig = plt.figure(figsize=FIG_SIZE)
ax = fig.add_subplot(111, projection='3d')
ax.plot_surface(
    agrid, bgrid, -results.cpu().numpy(),
    cmap=CMAP,
    alpha=ALPHA,
)
plt.title(name + " 3D")
plt.show()

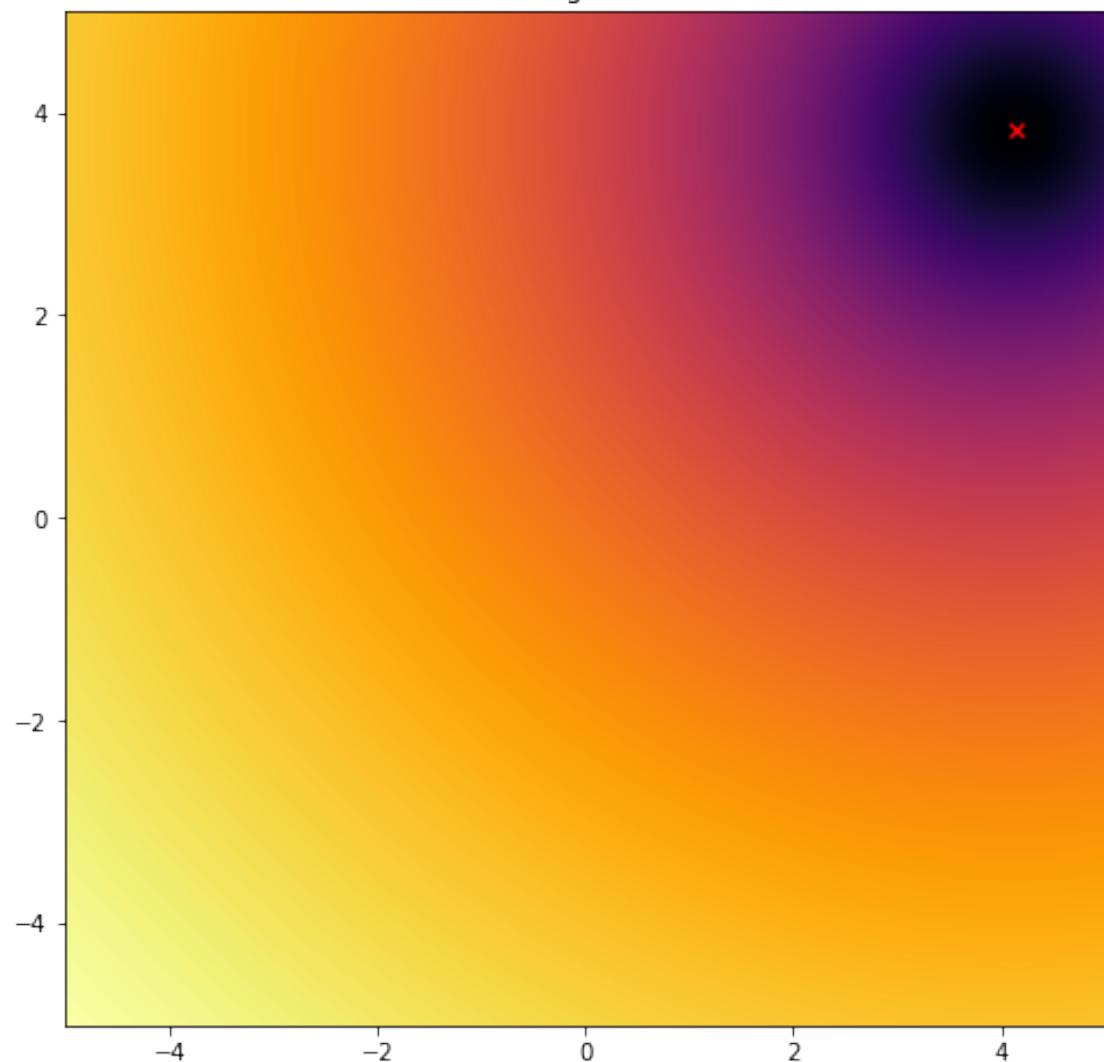
fig = plt.figure(figsize=FIG_SIZE)
ax = fig.add_subplot(111, projection='3d')
ax.plot_surface(
    agrid, bgrid, -t.log_(results+1).cpu().numpy(),
    cmap=CMAP,
    alpha=ALPHA,
)
plt.title(name + " log3D")
plt.show()

```

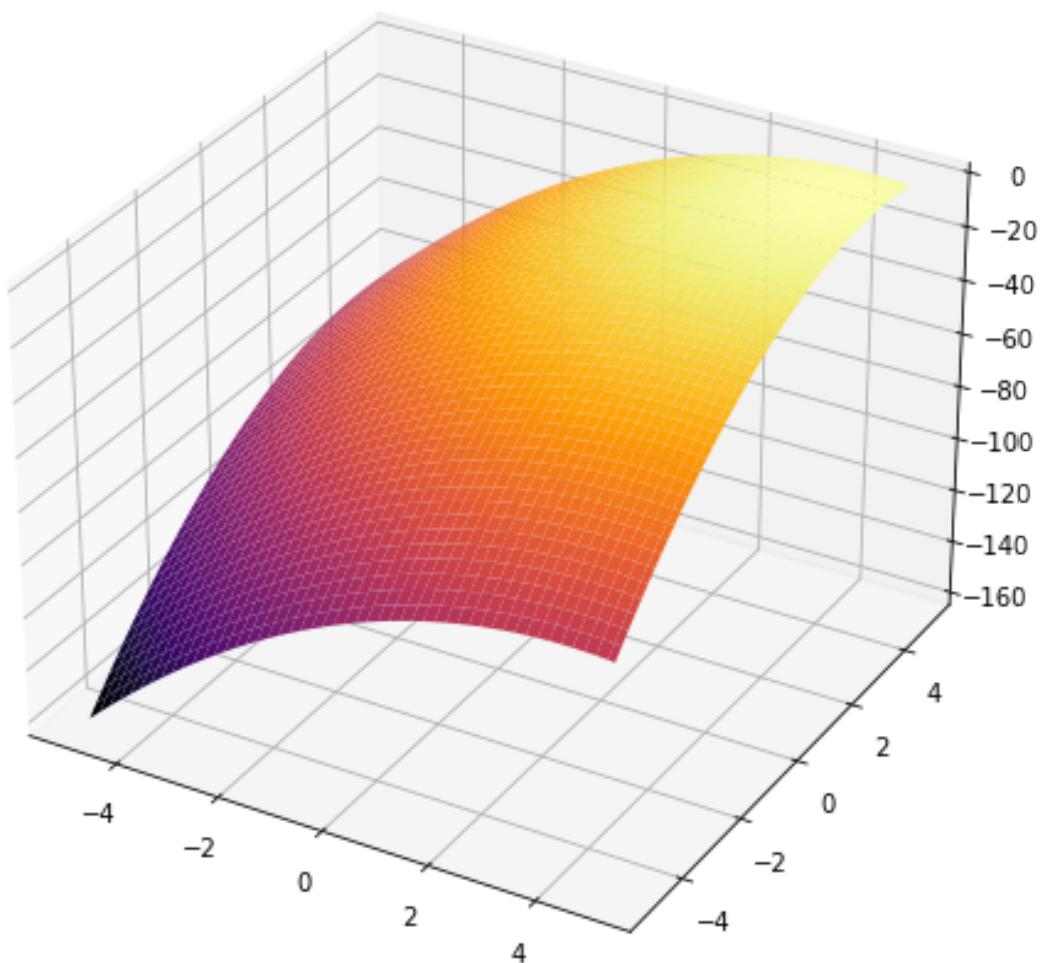
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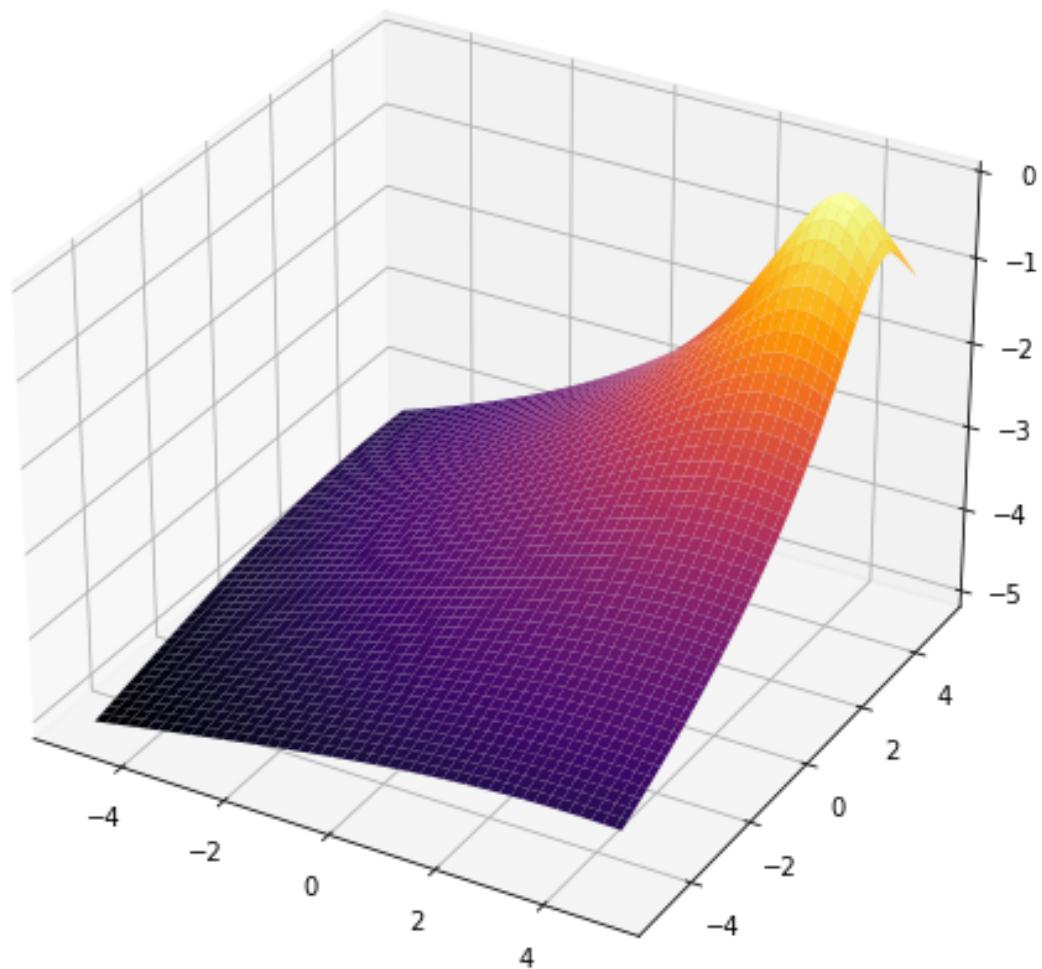
Log f01



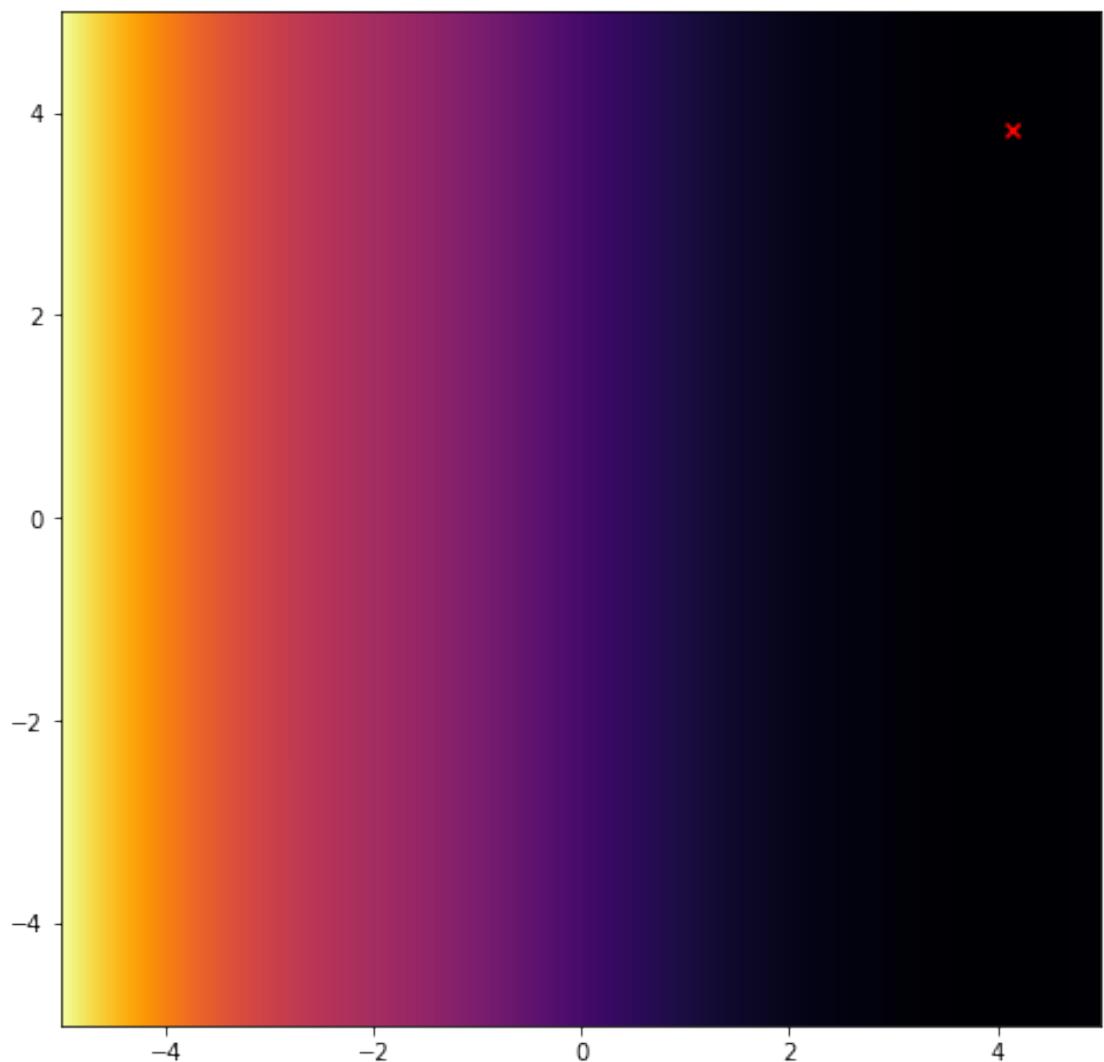
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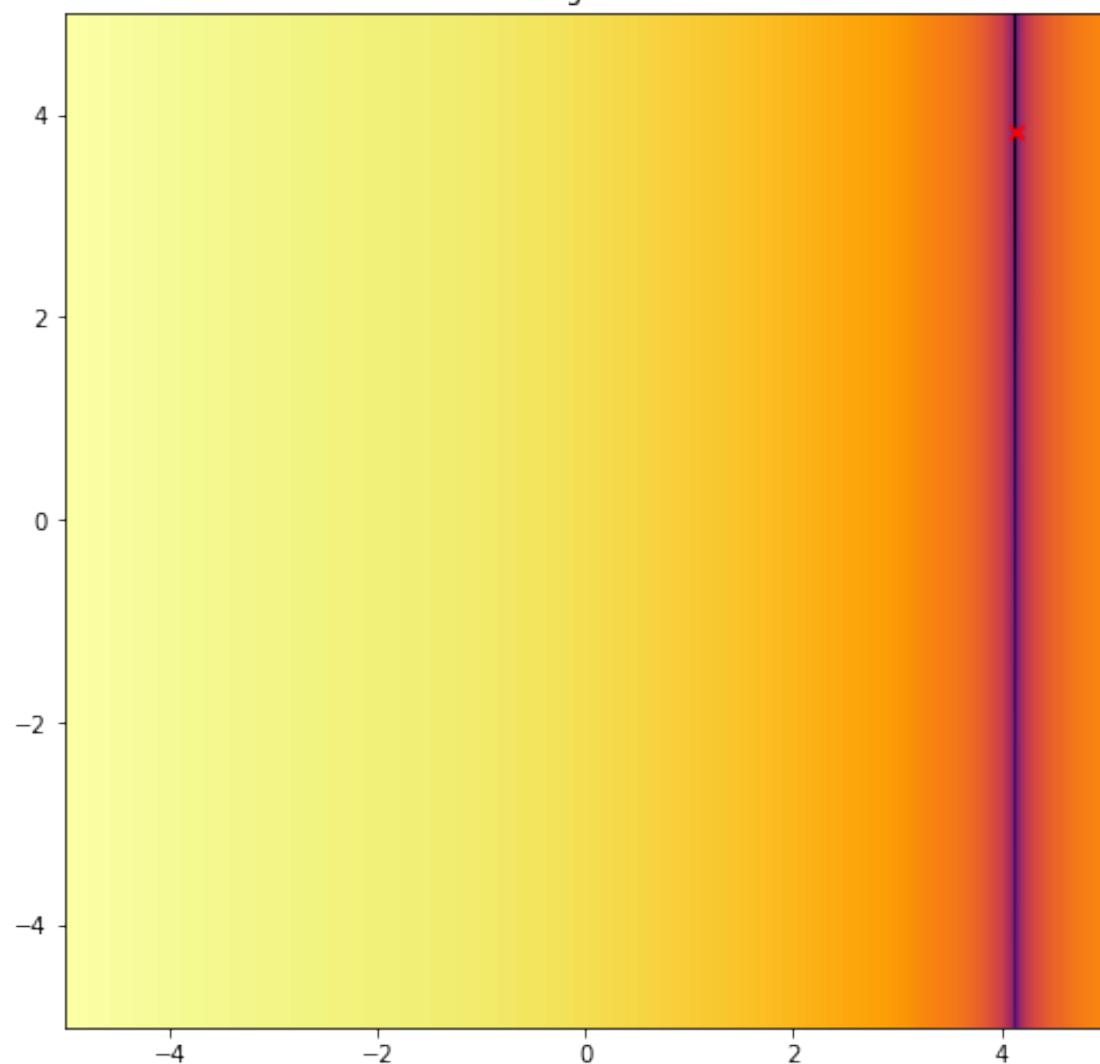
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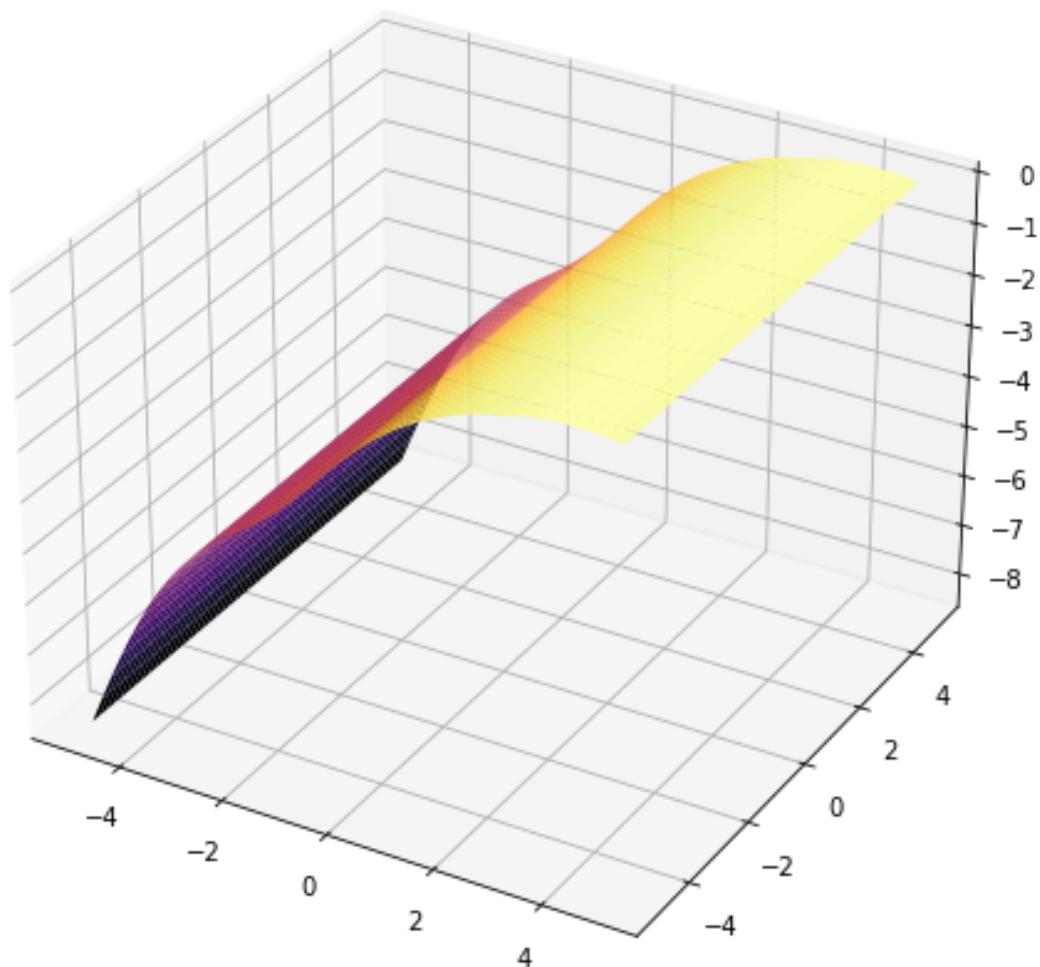
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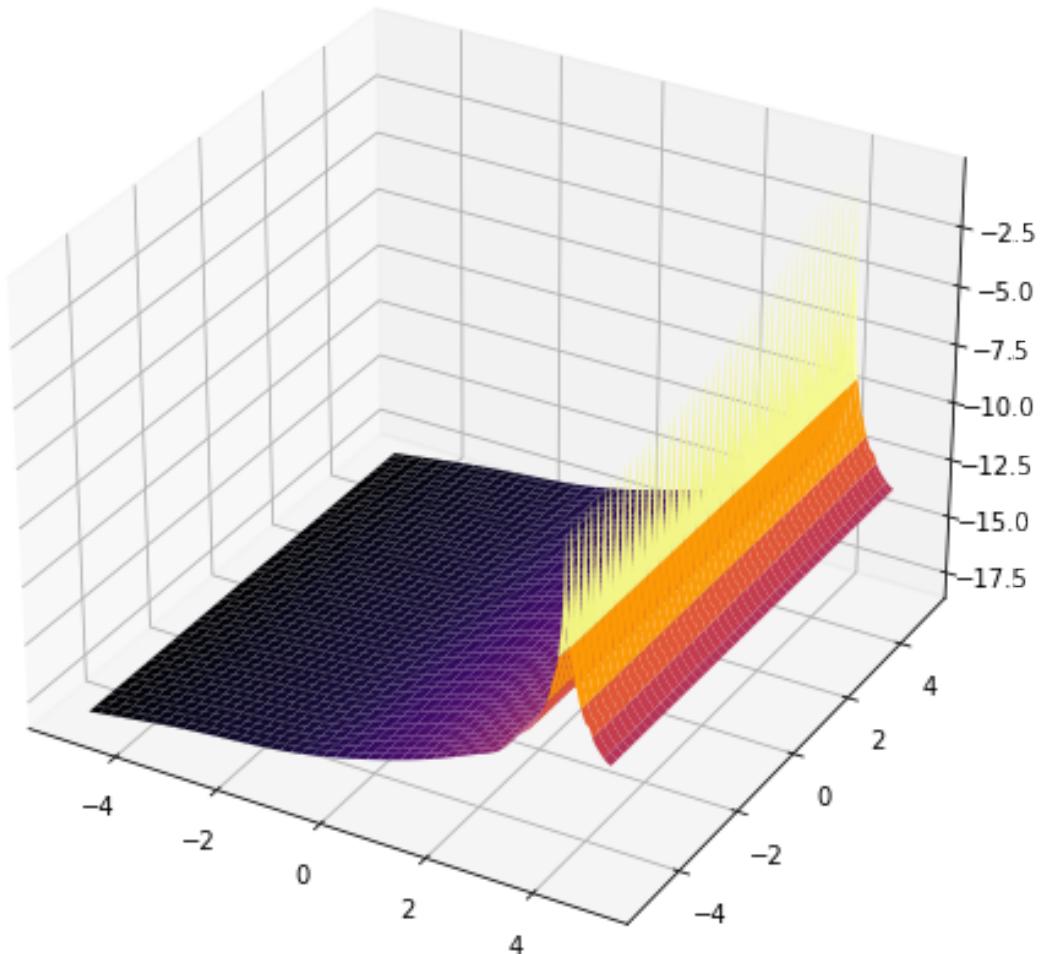
Log f02



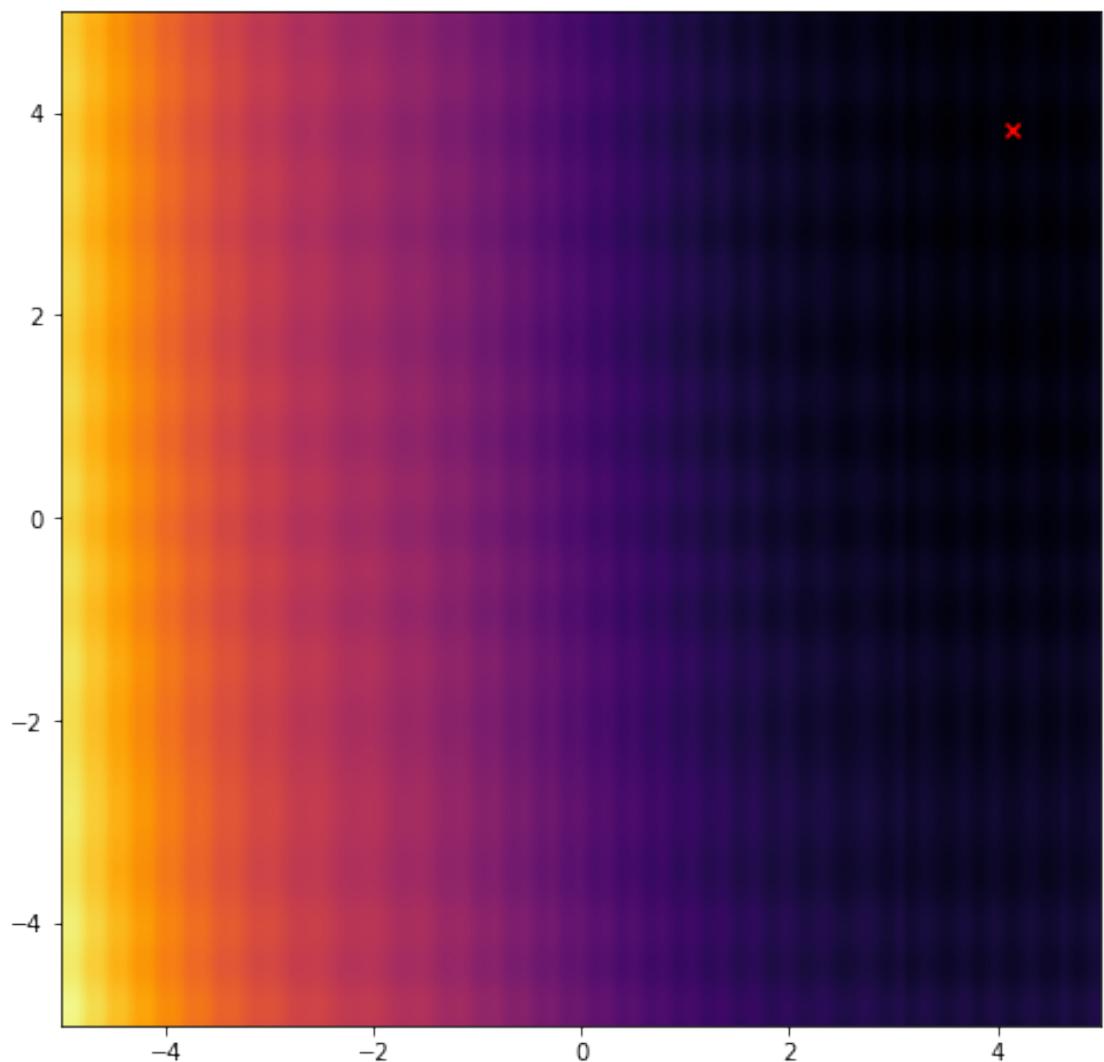
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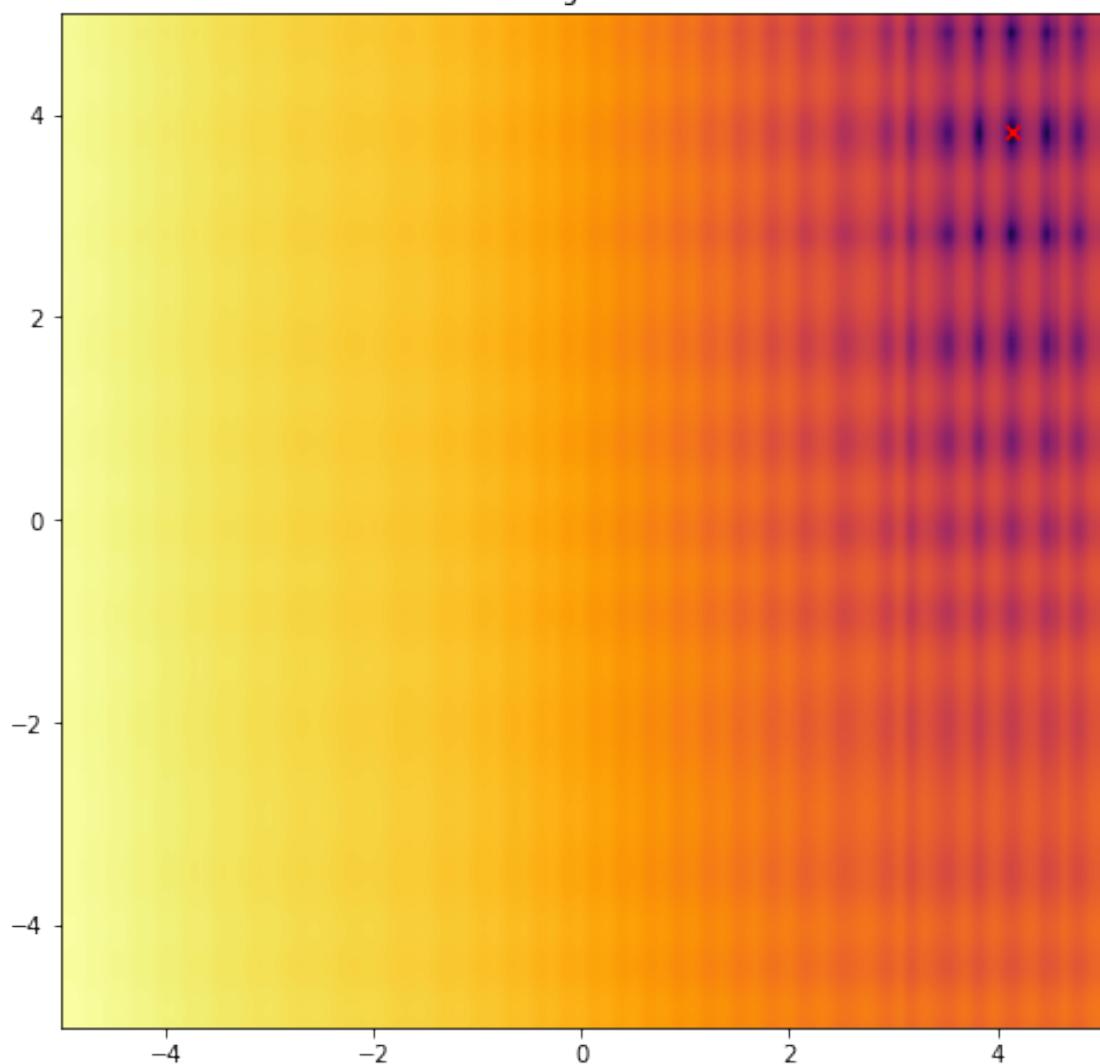
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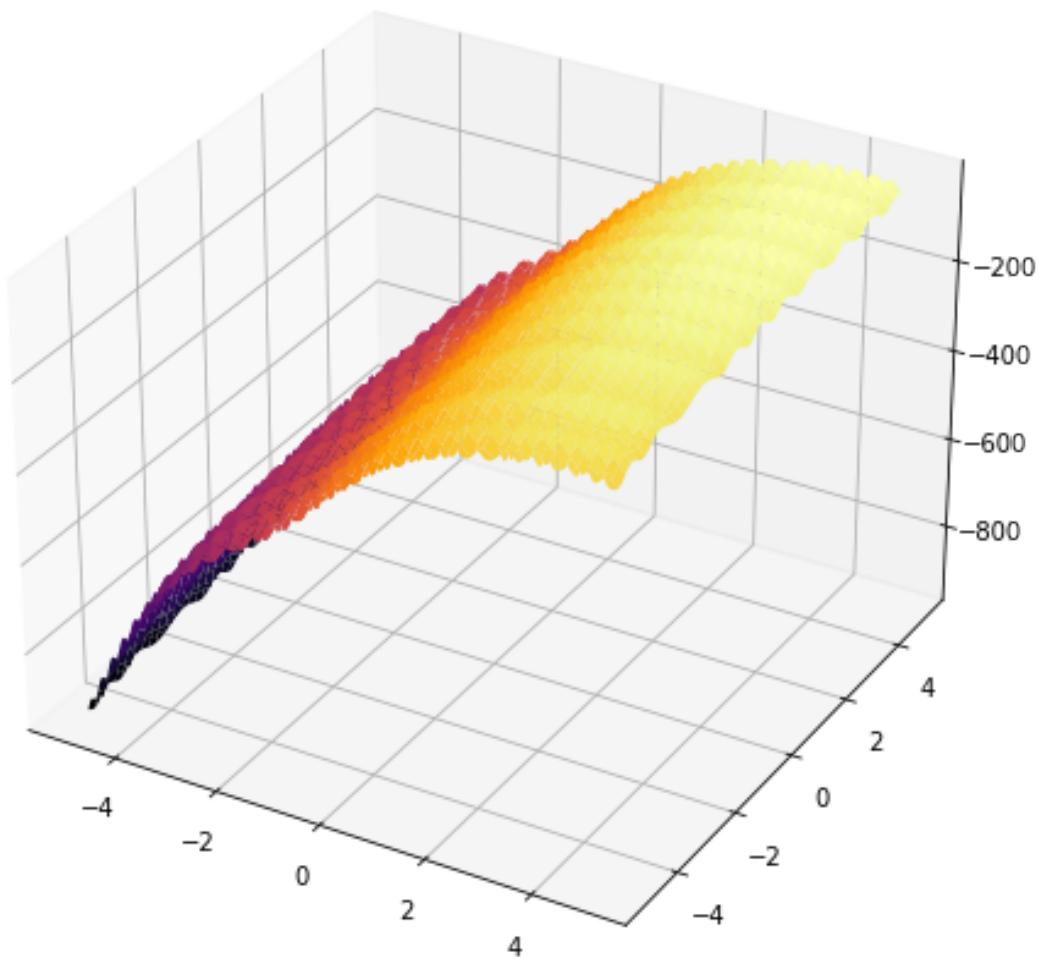
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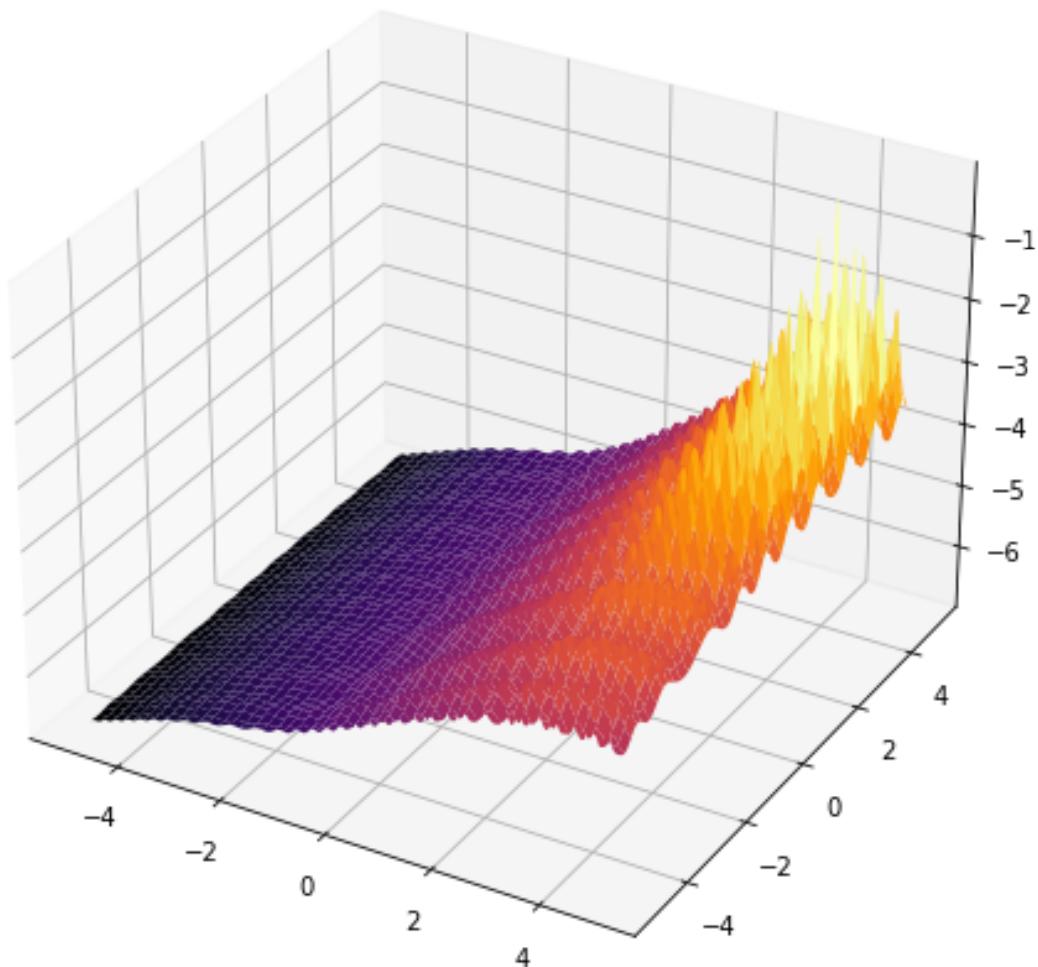
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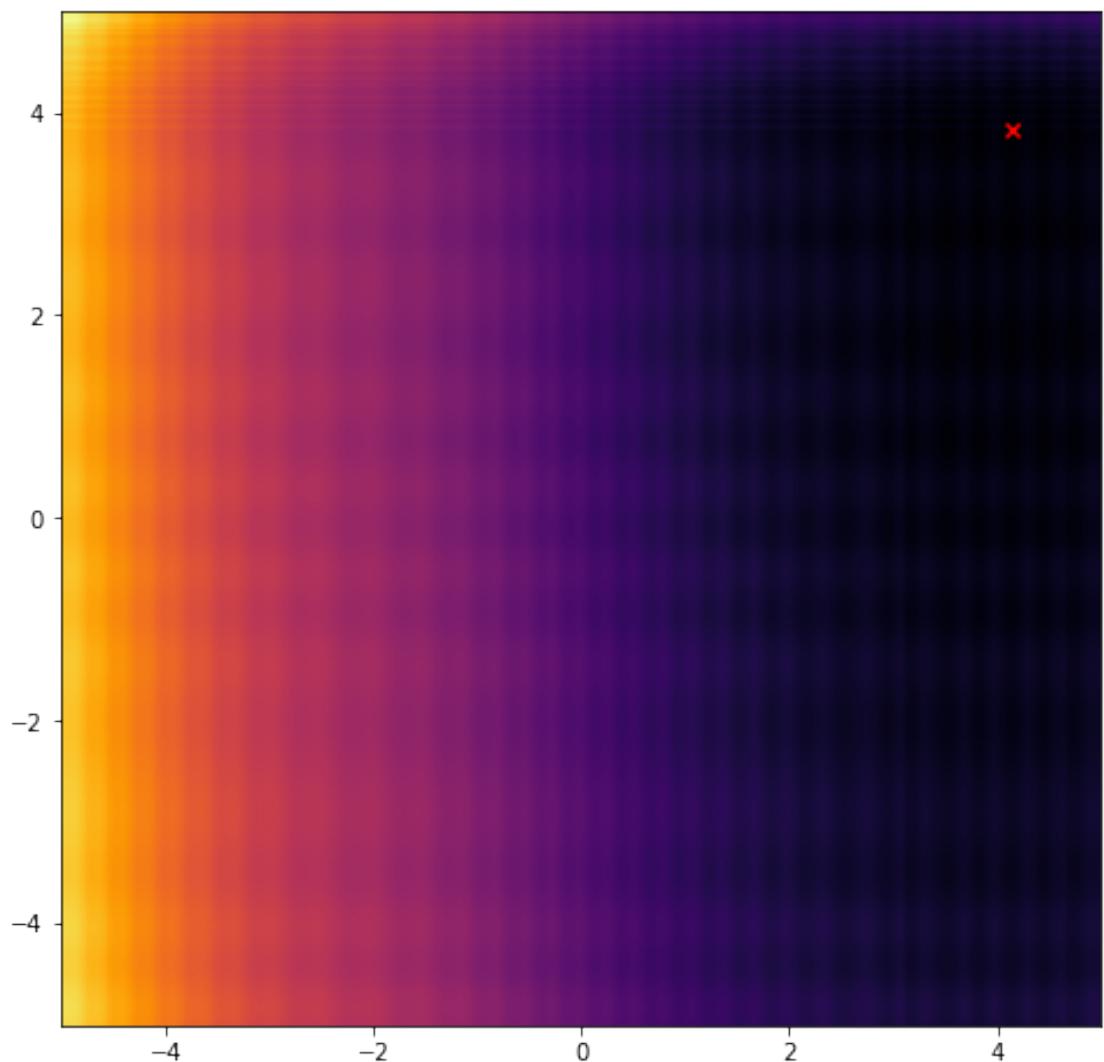
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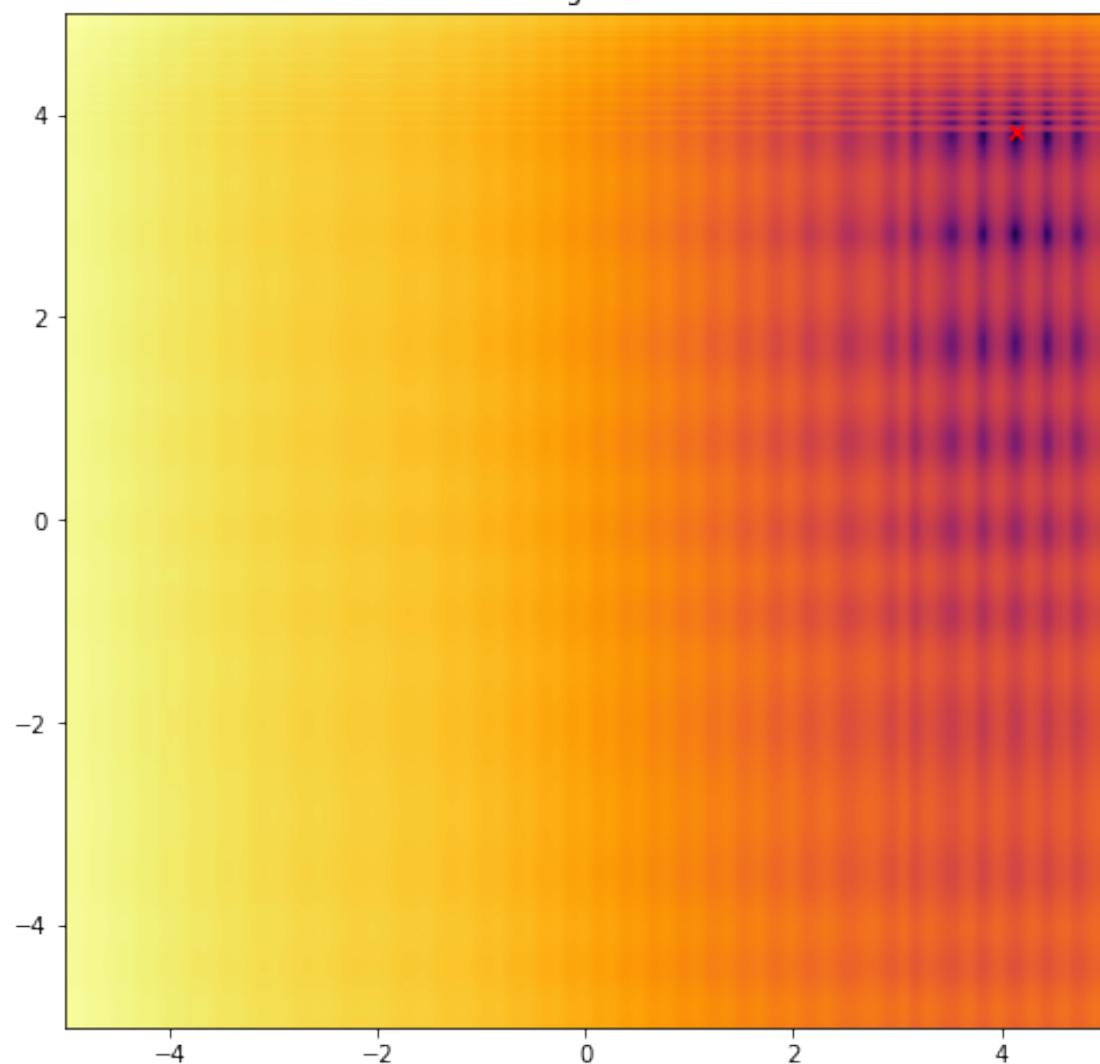
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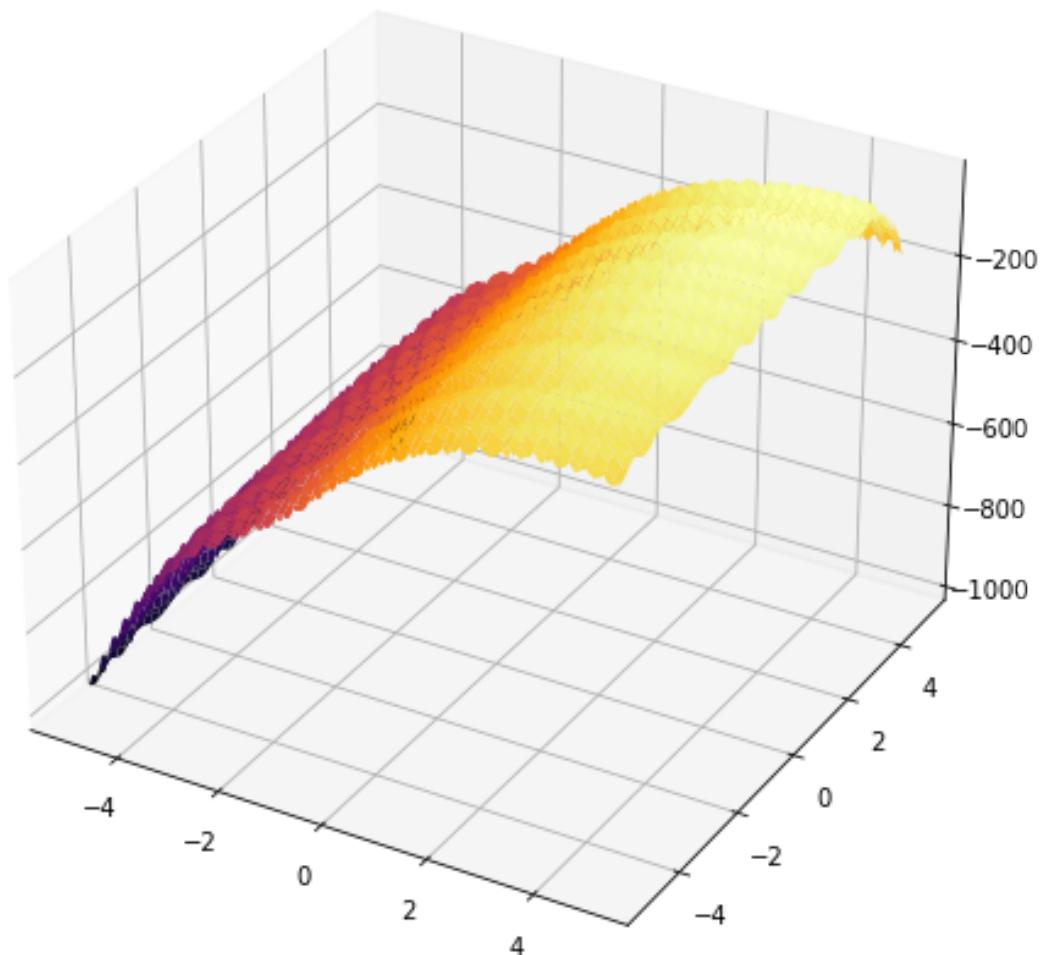
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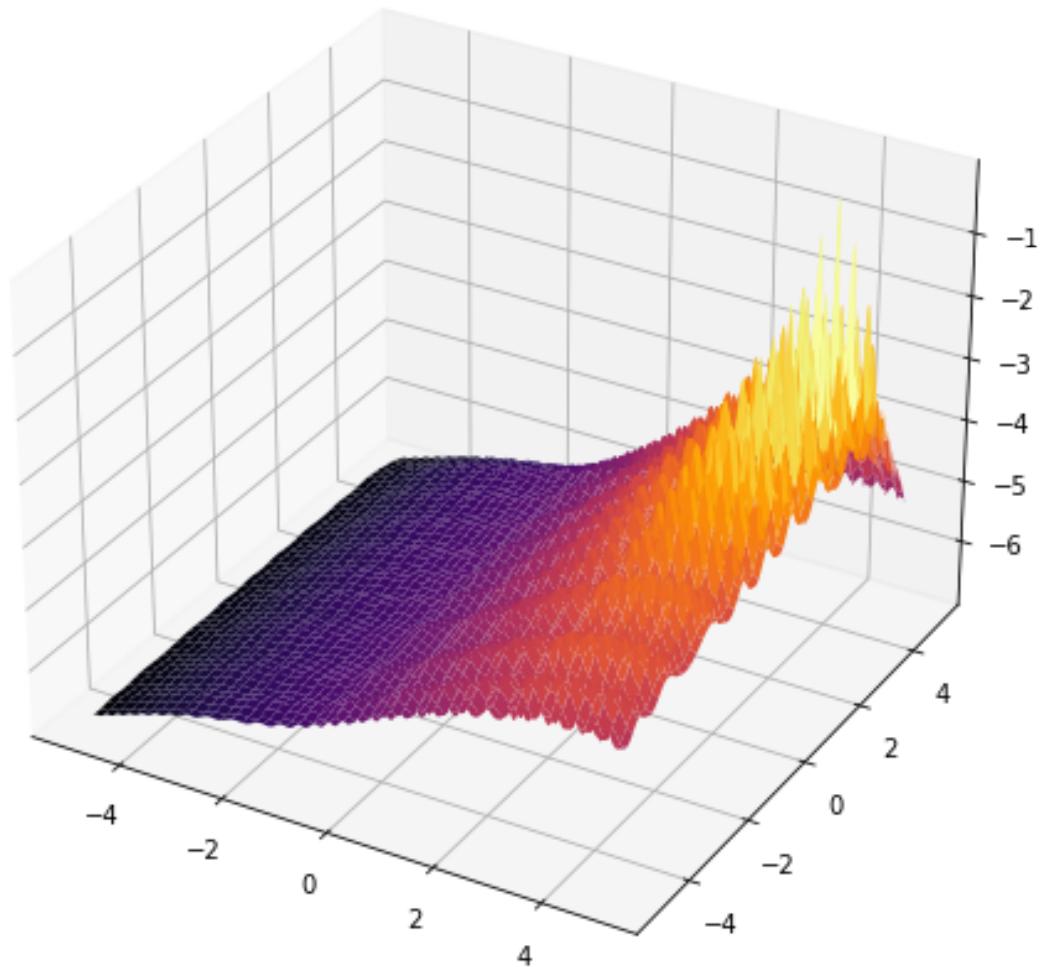
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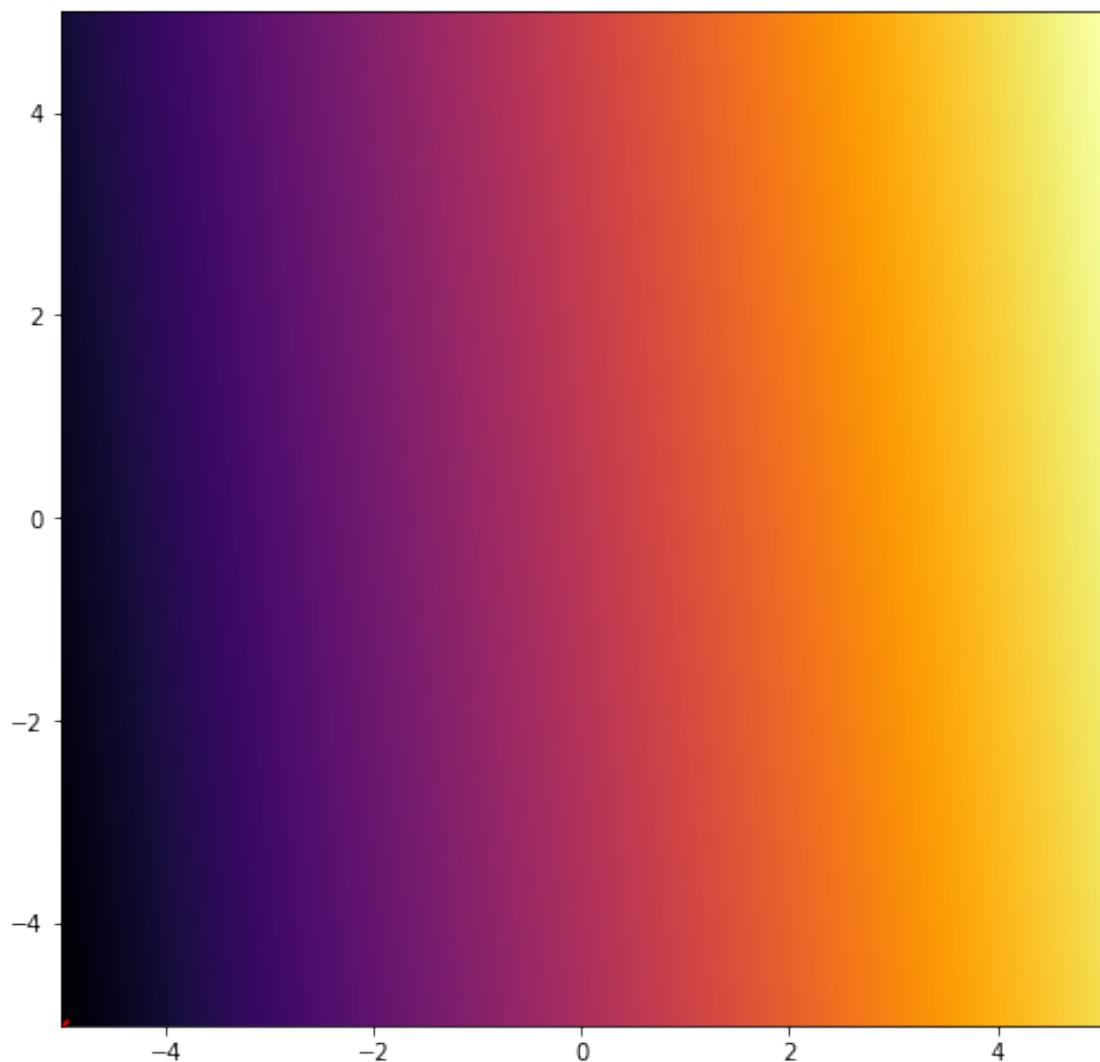
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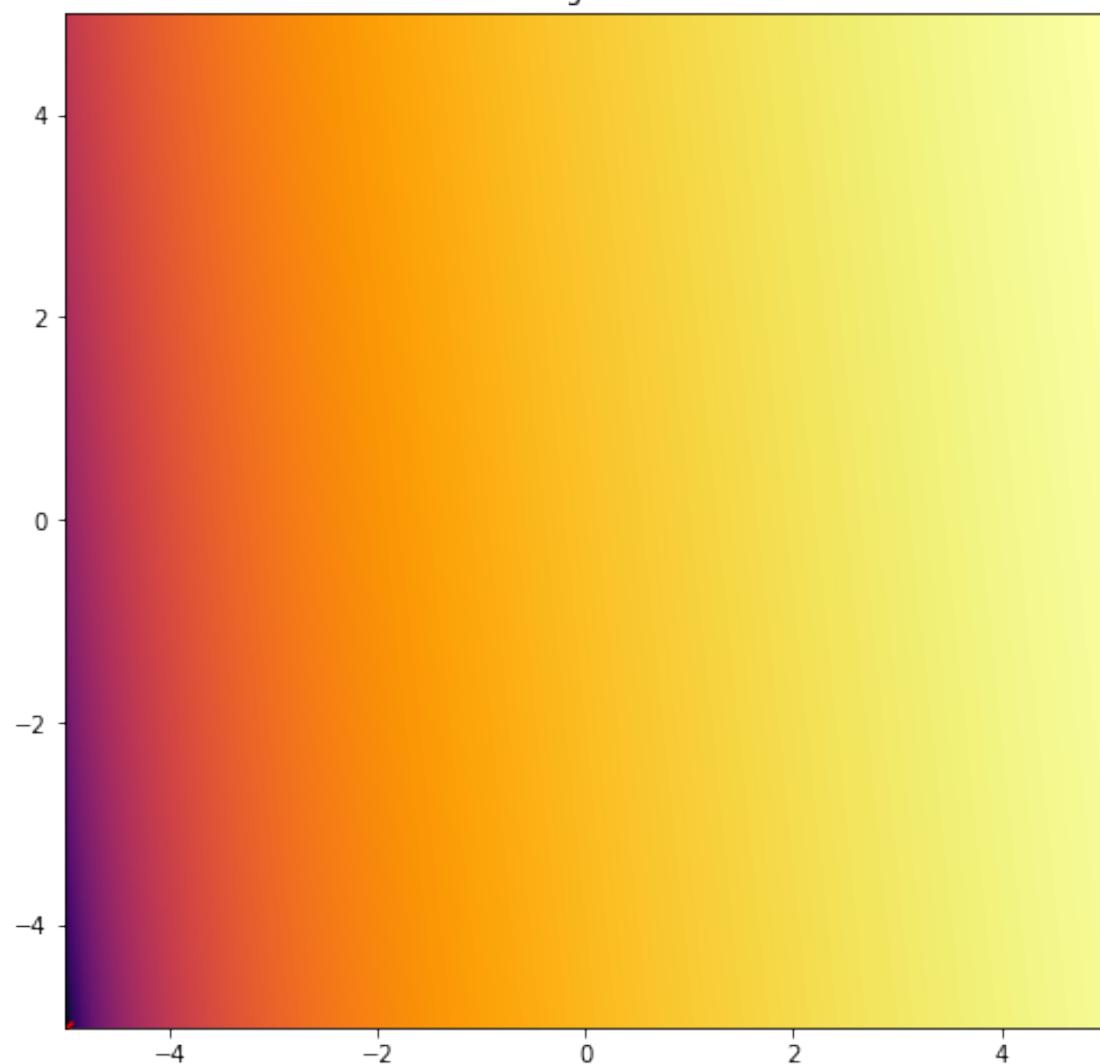
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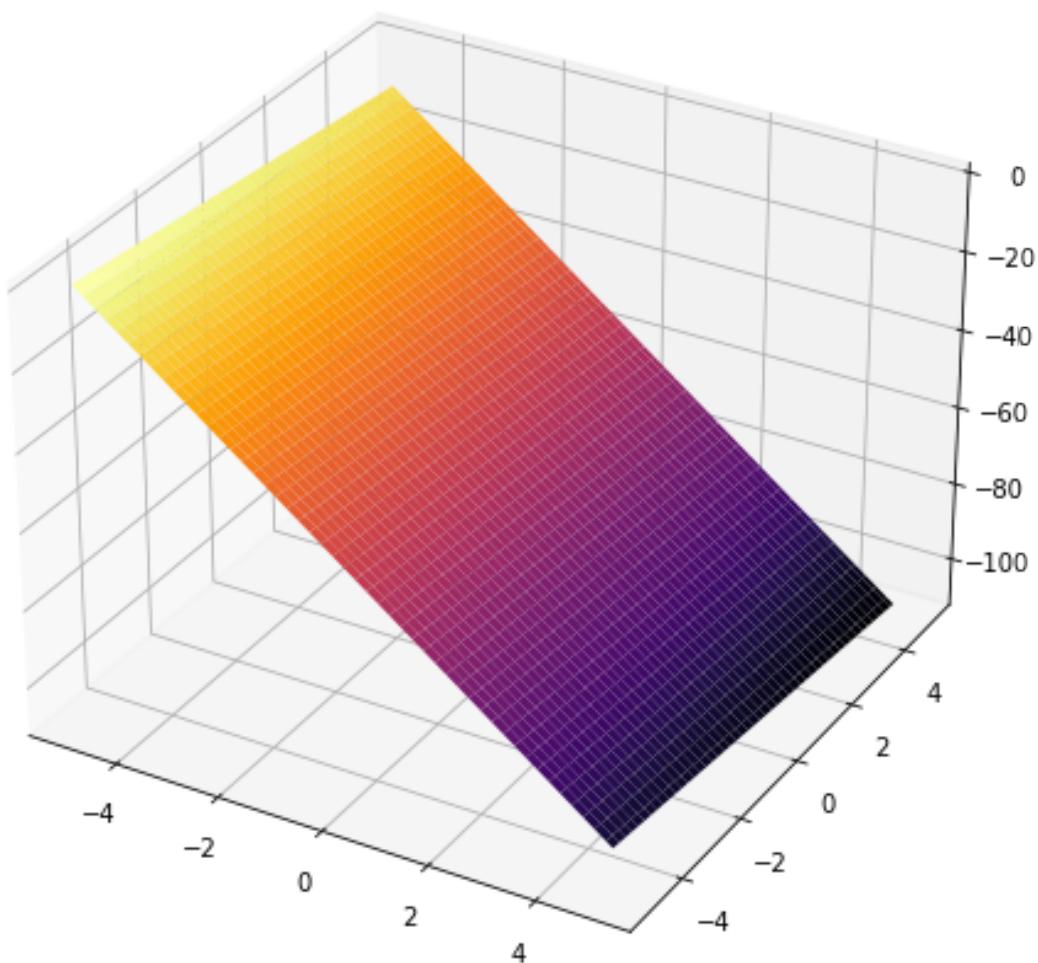
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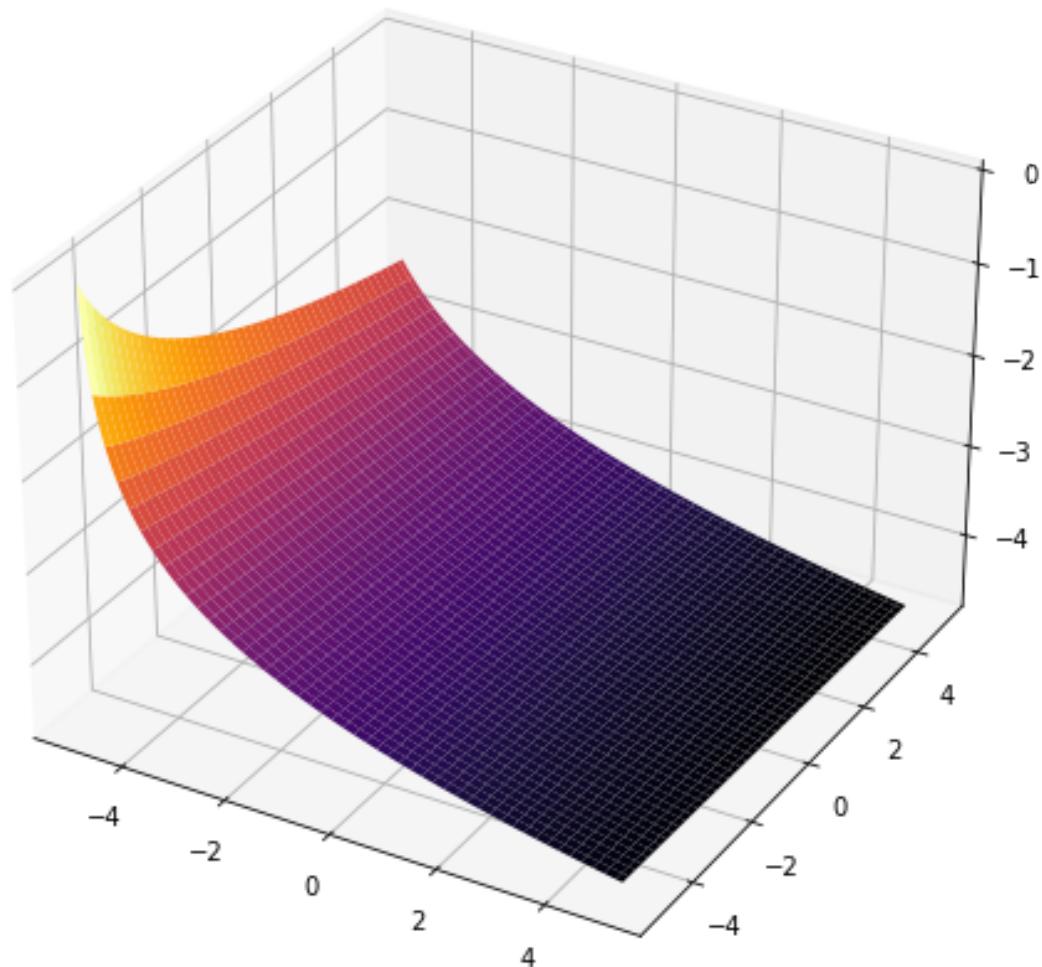
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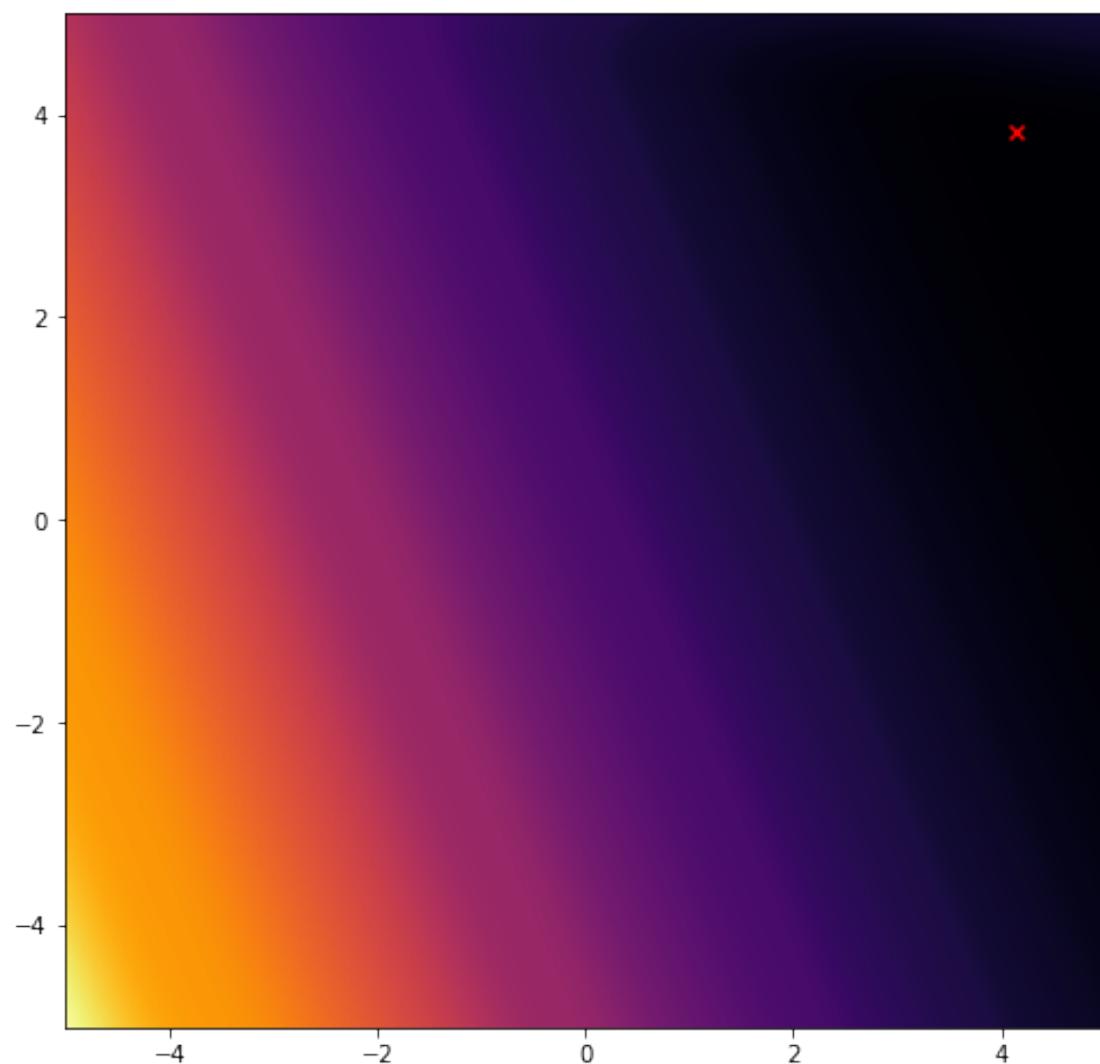
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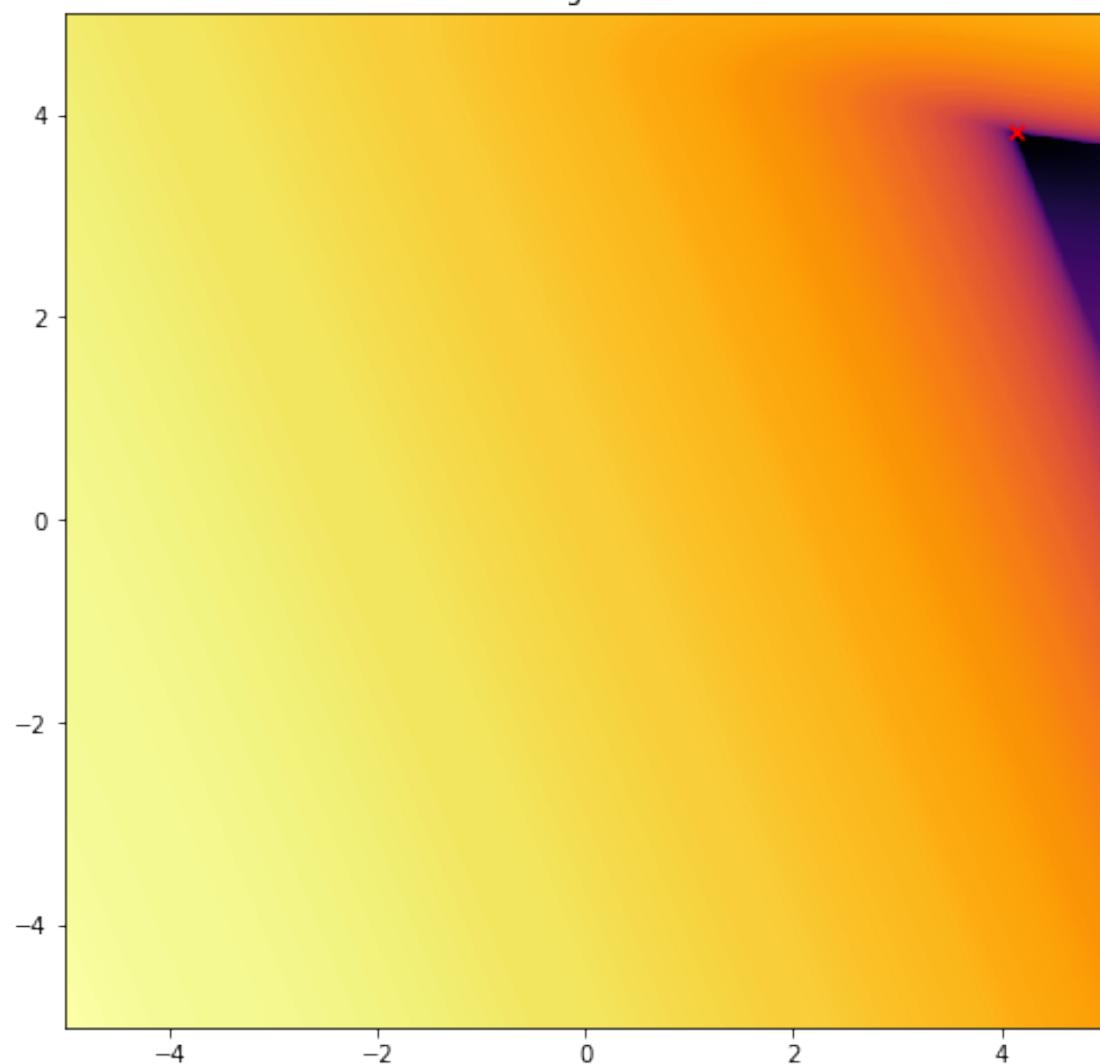
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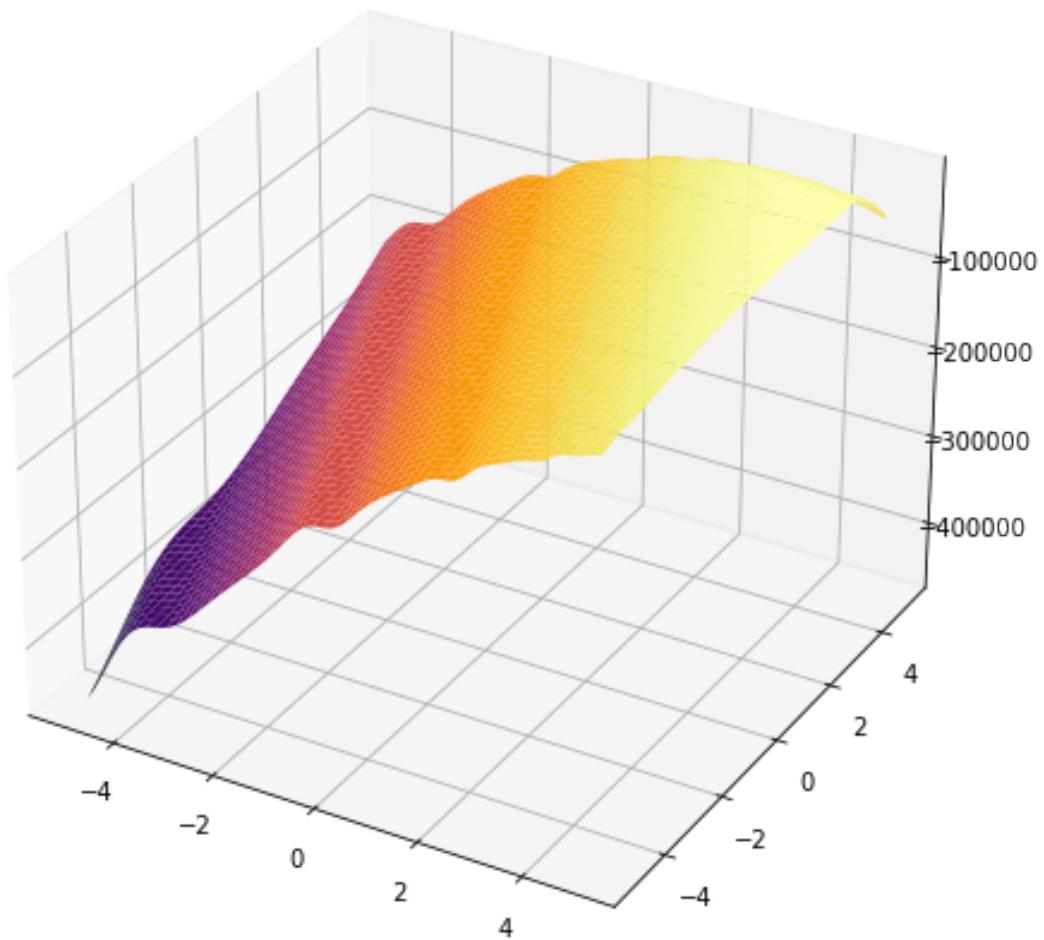
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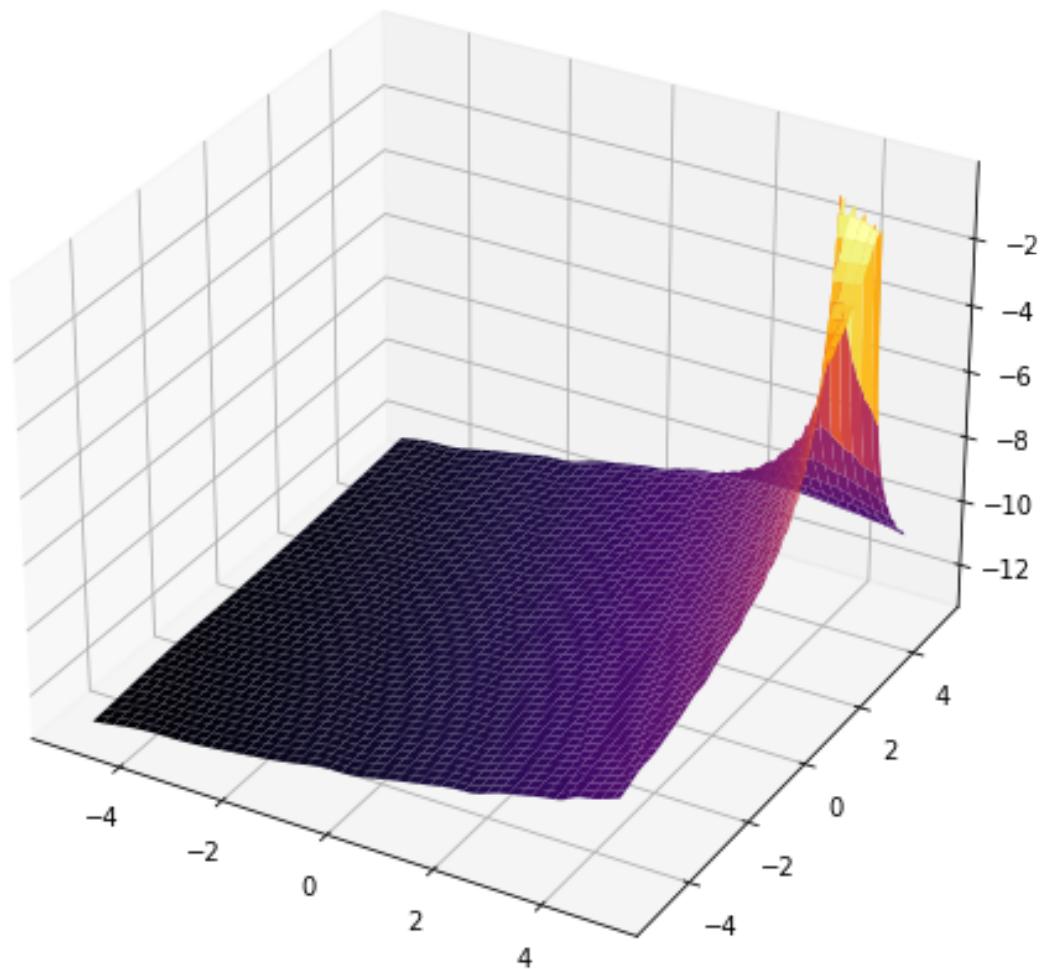
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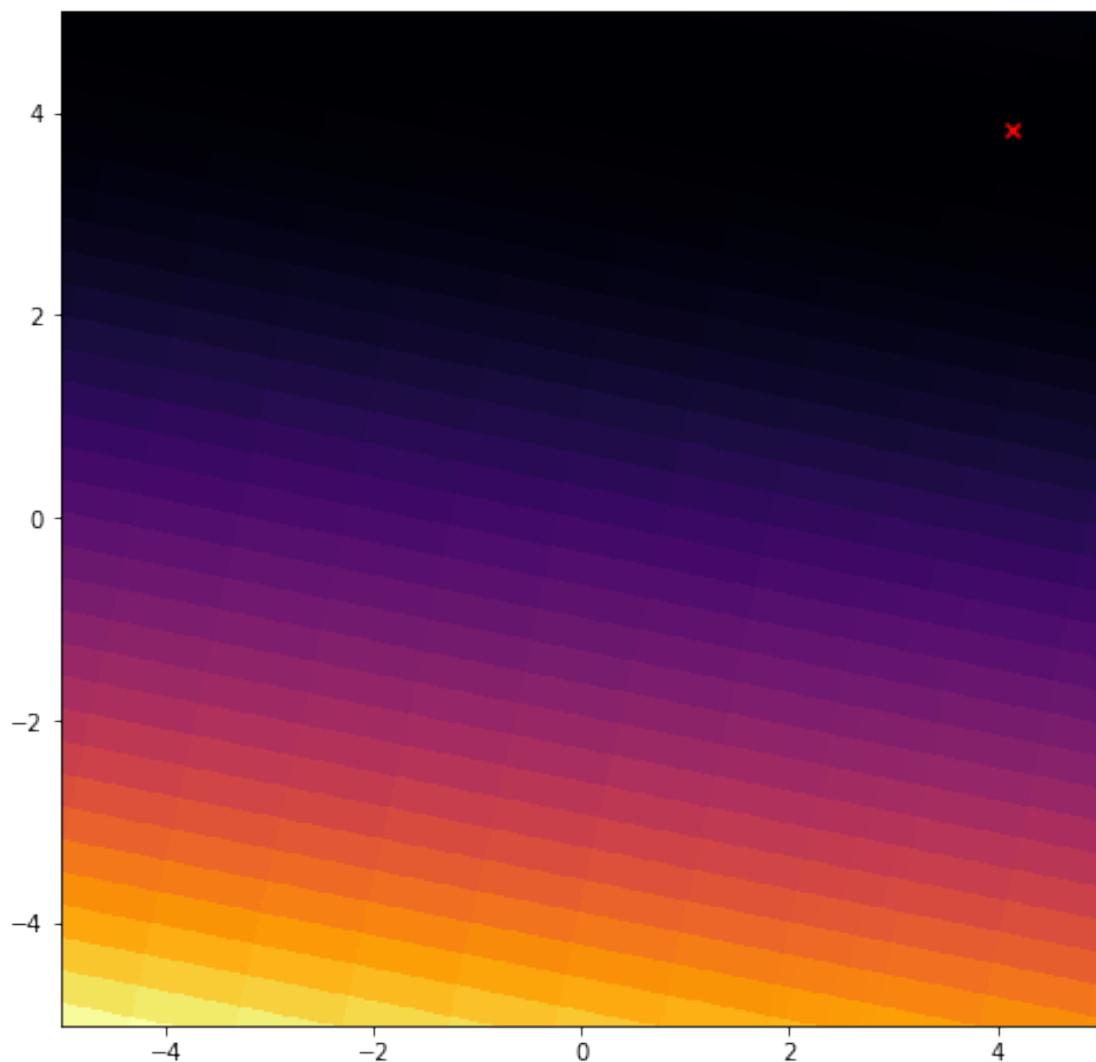
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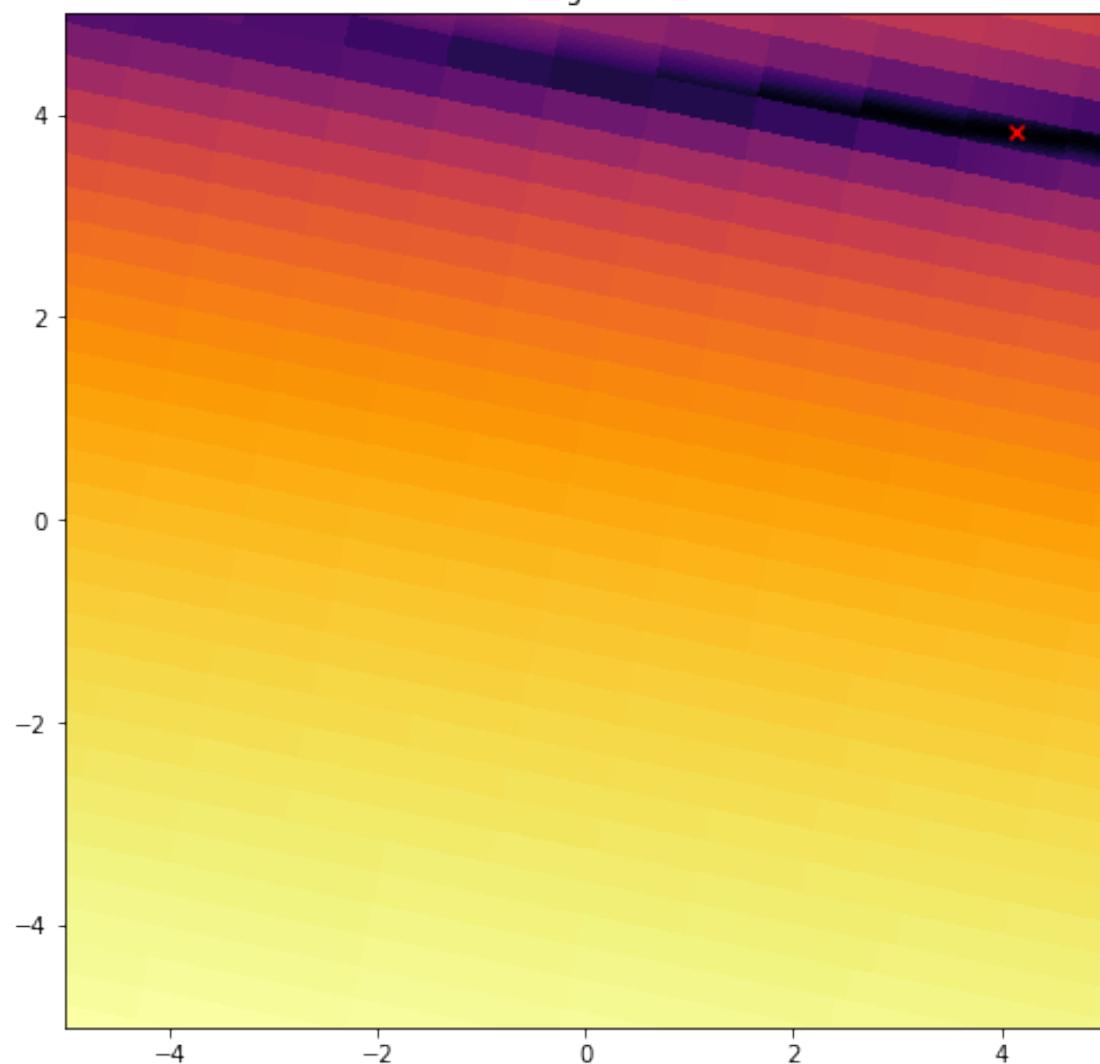
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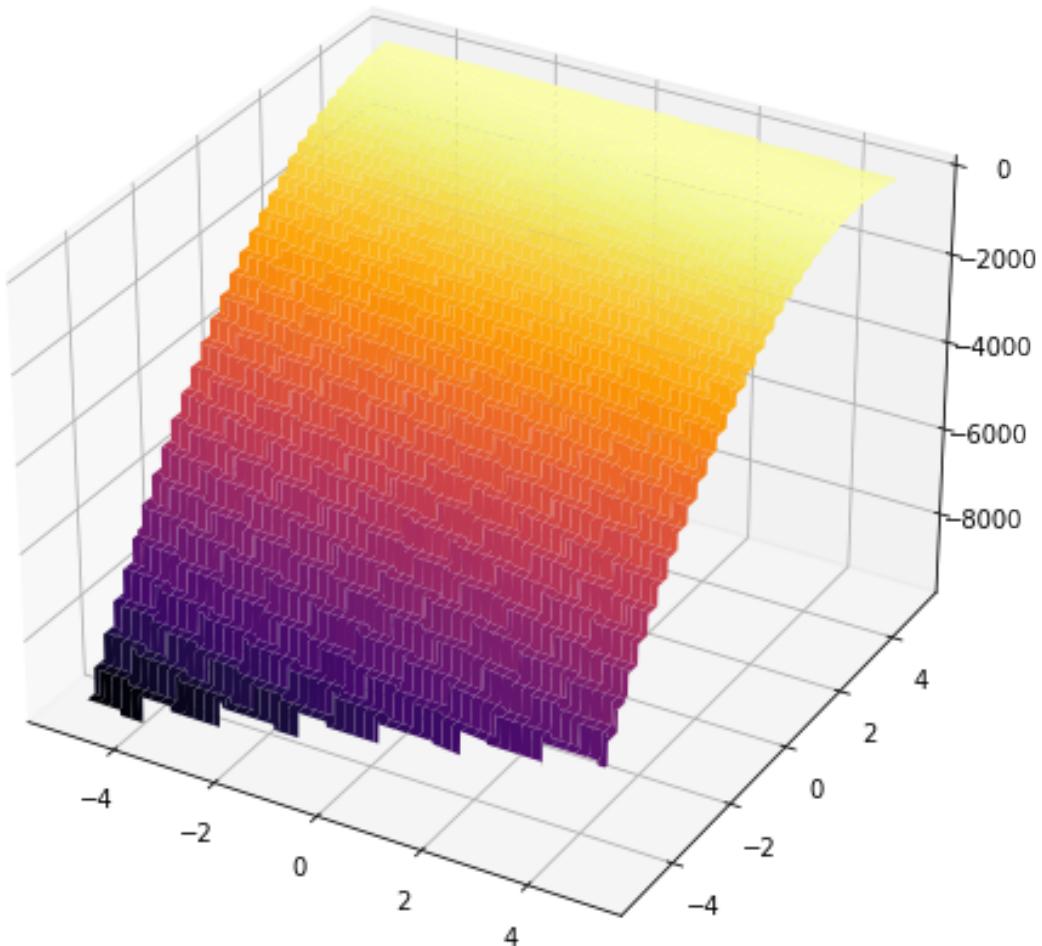
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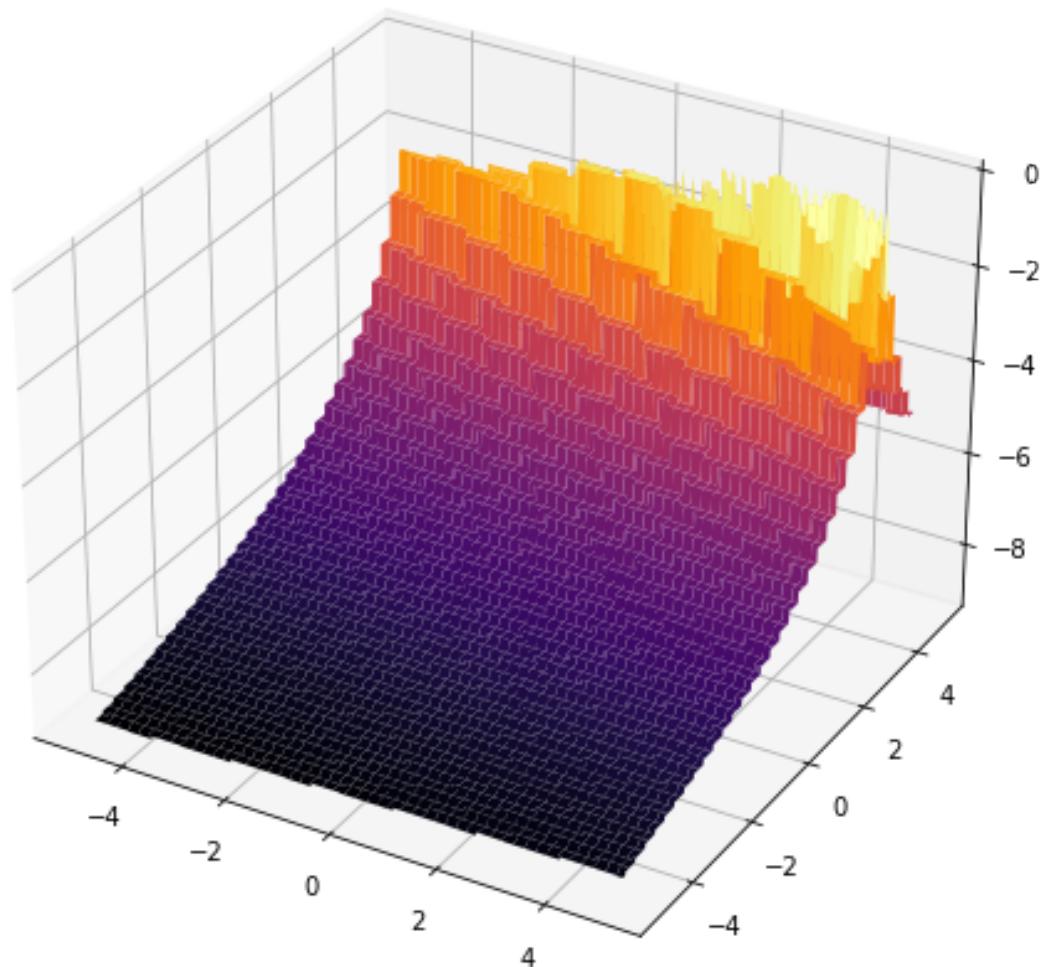
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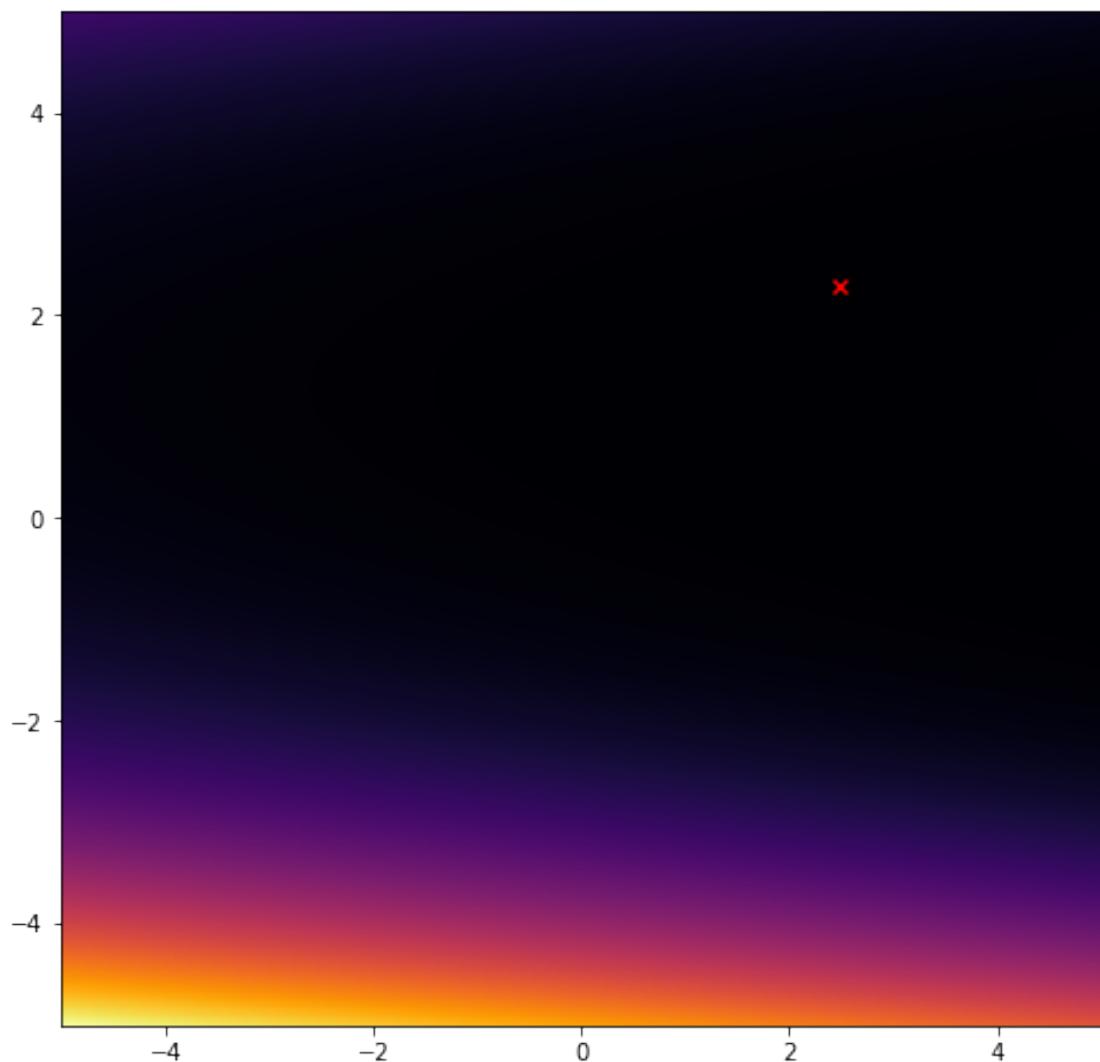
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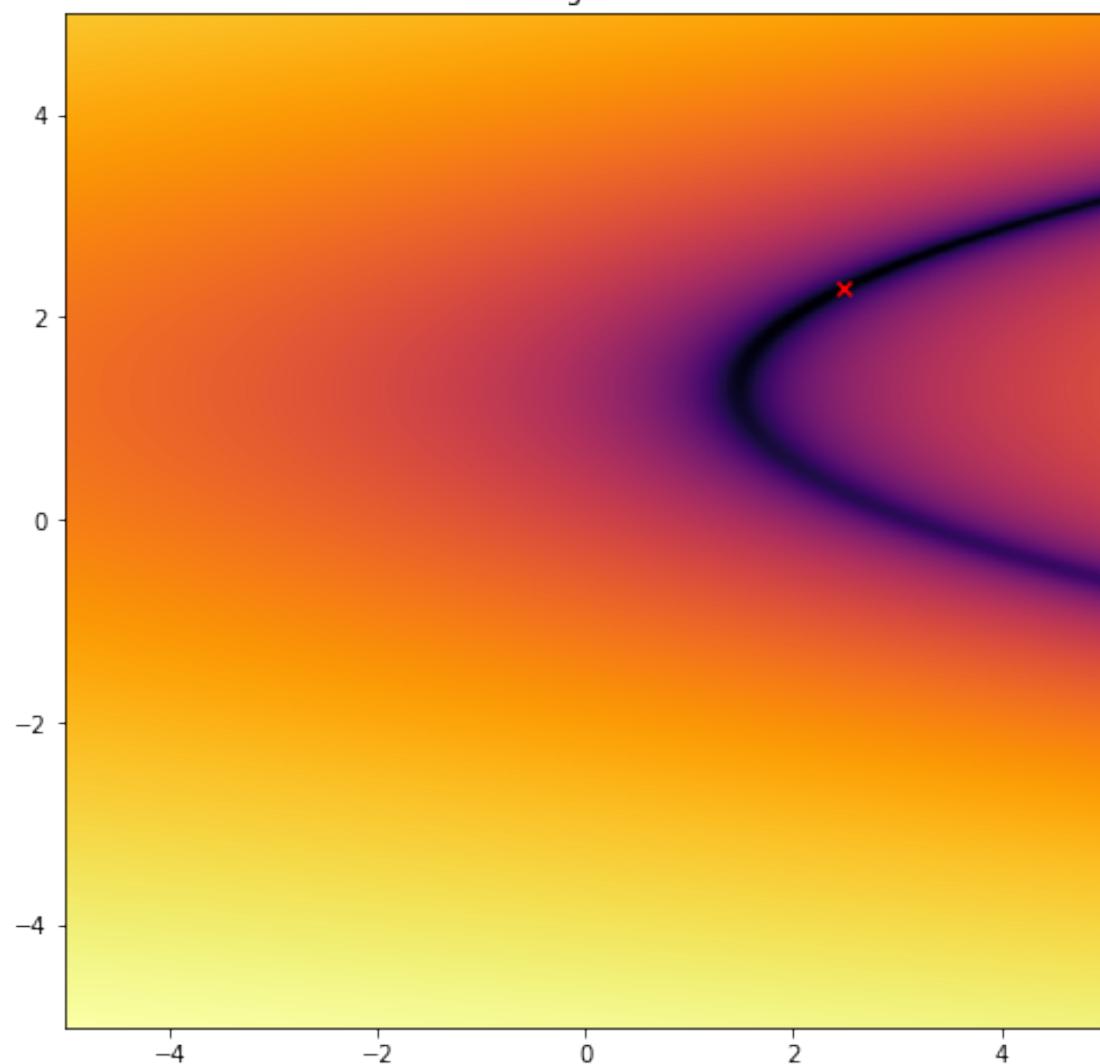
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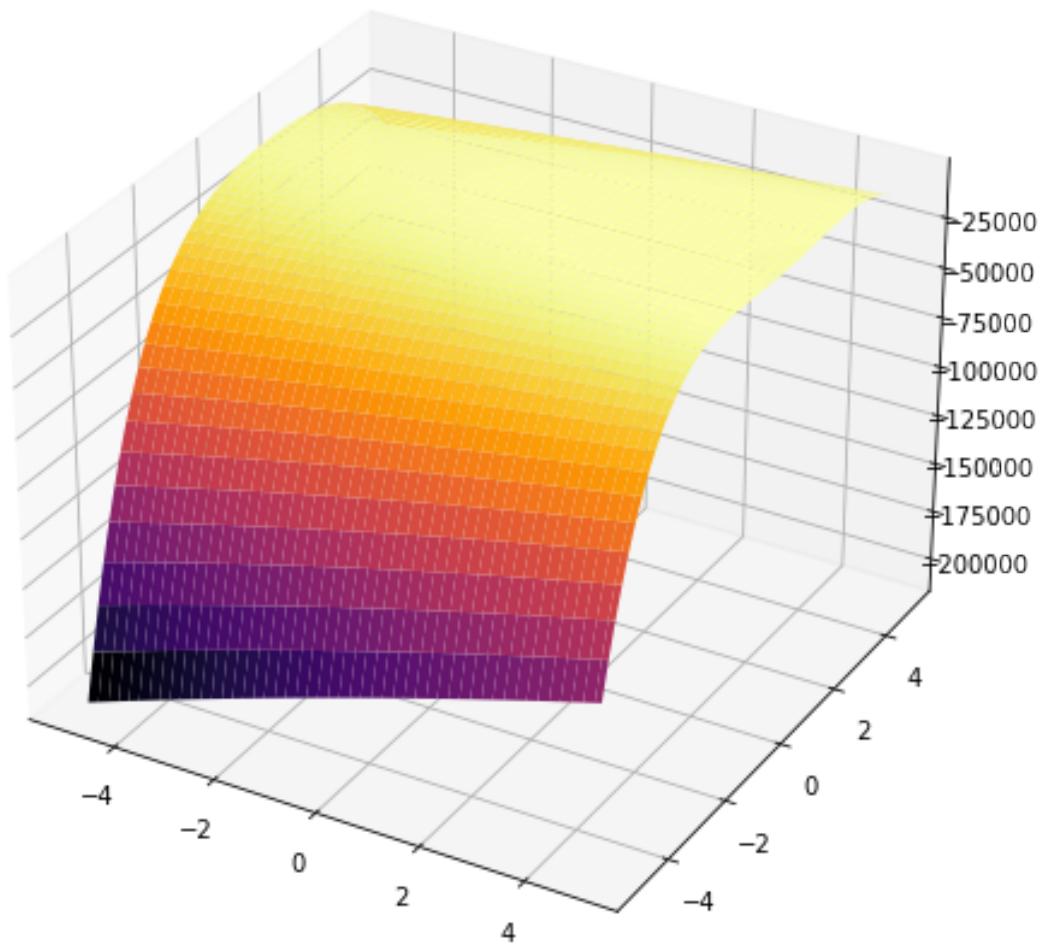
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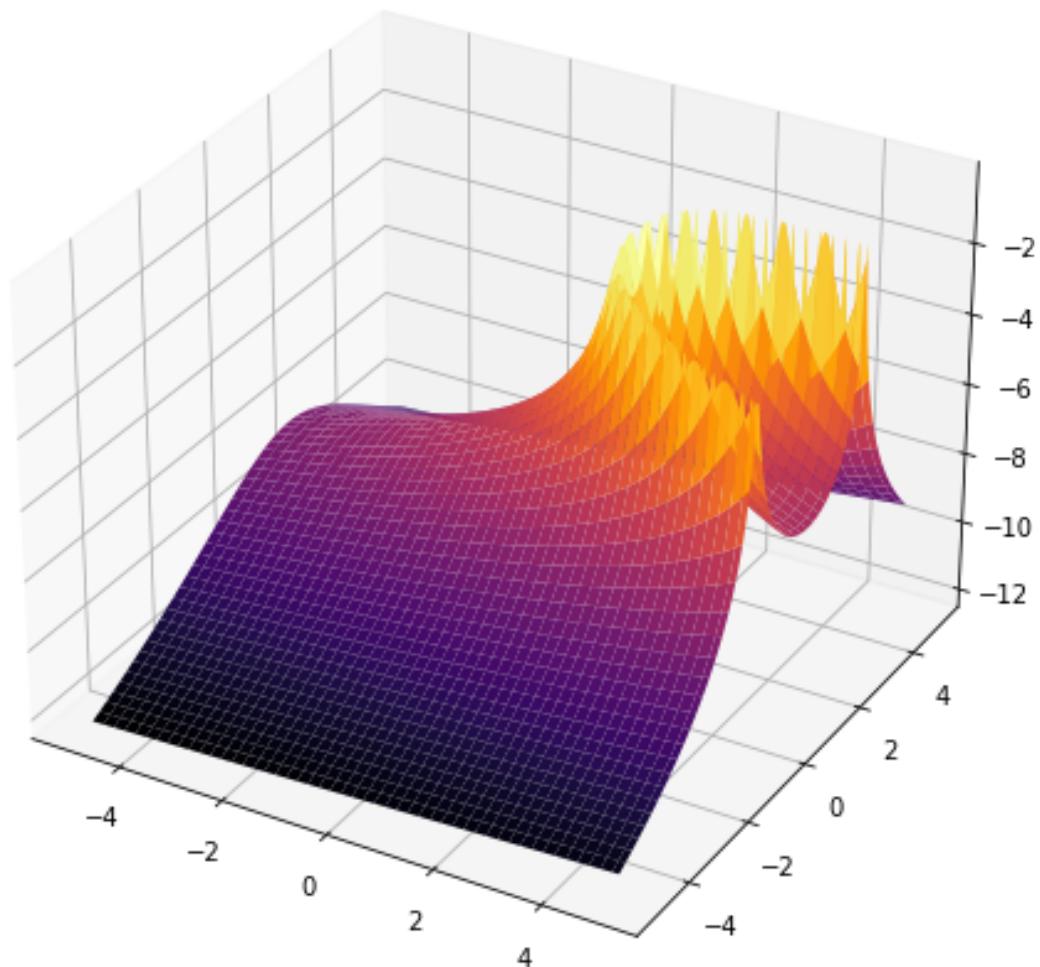
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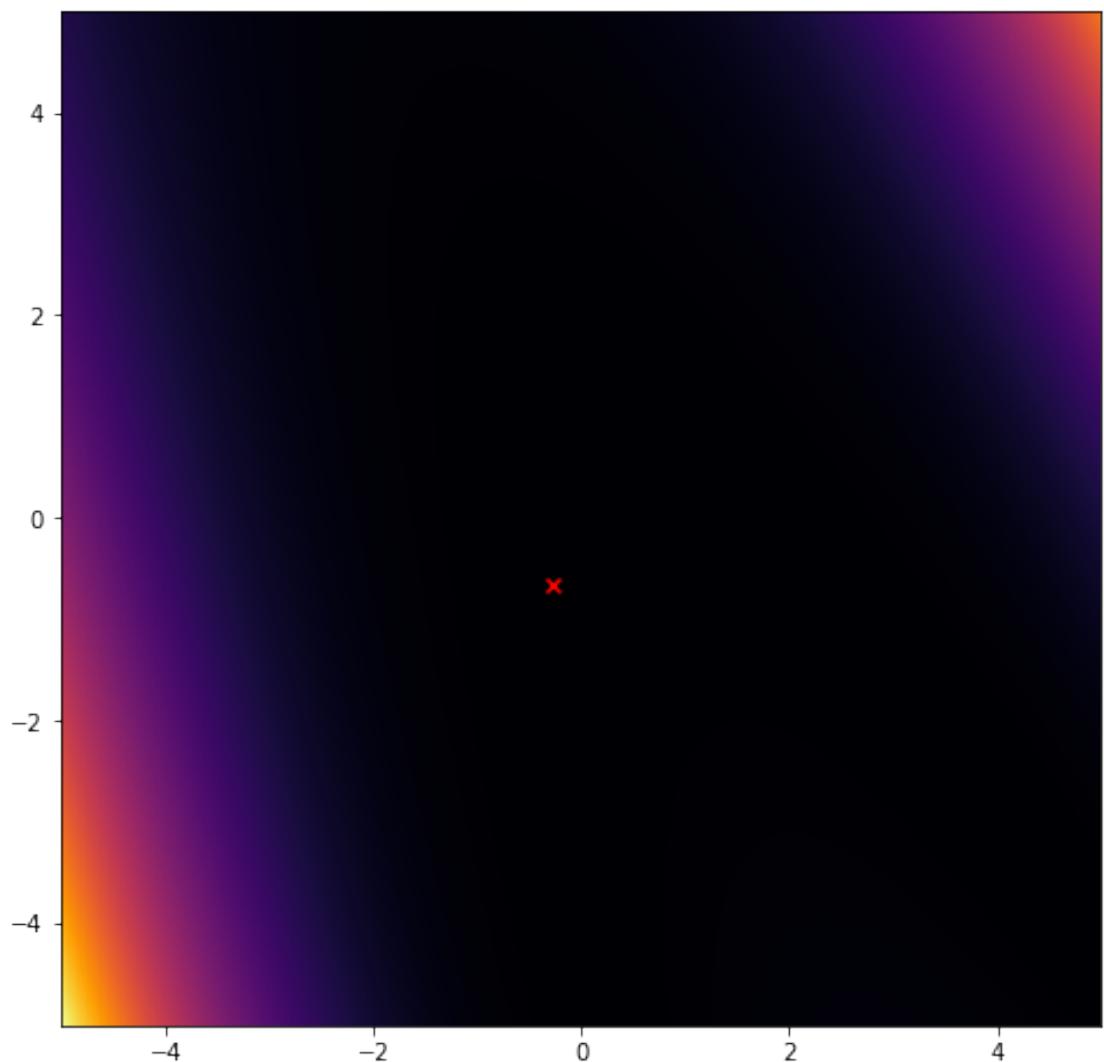
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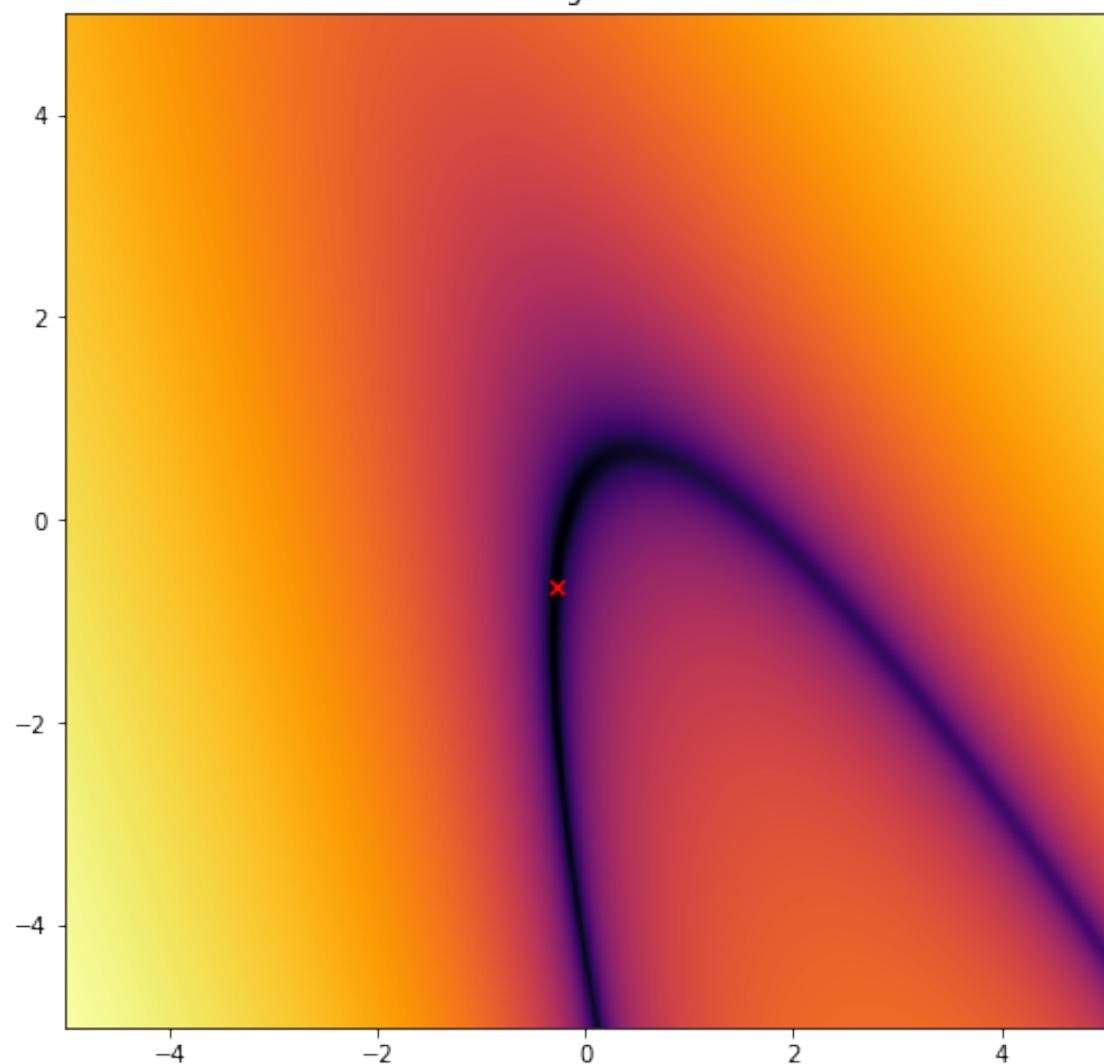
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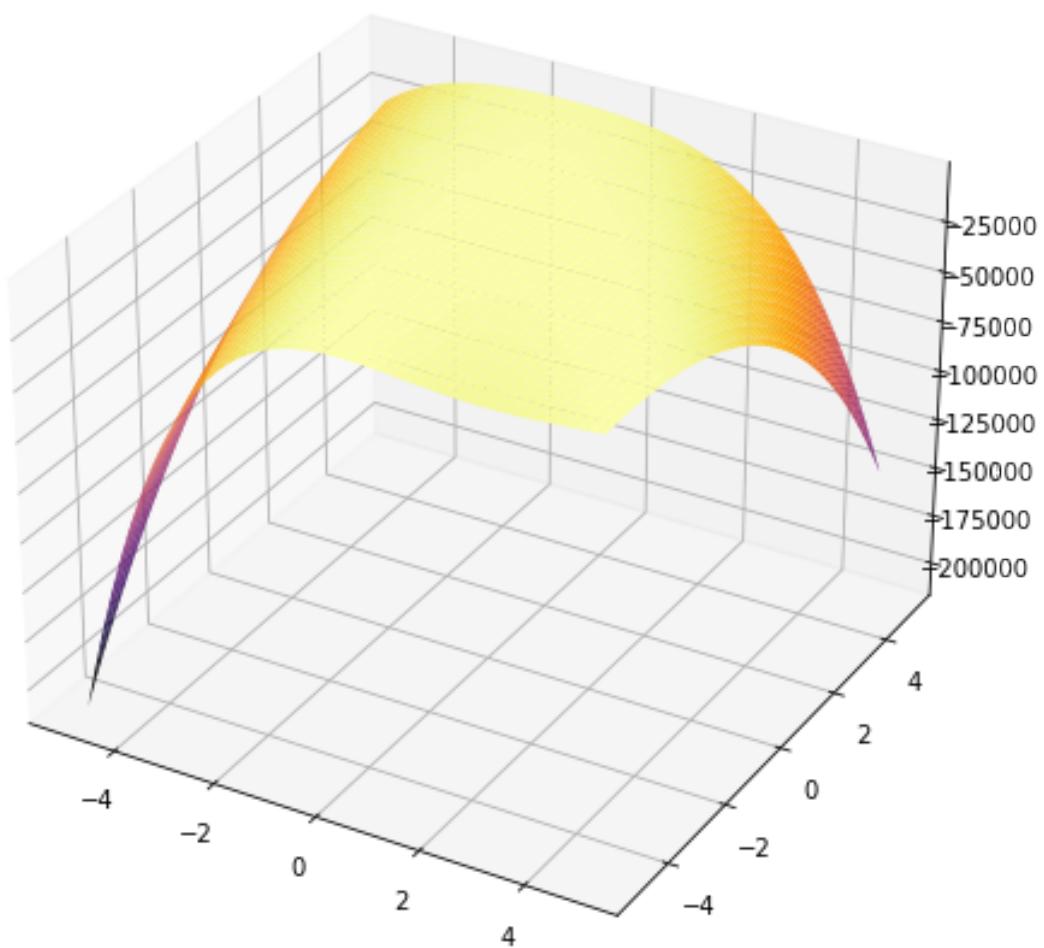
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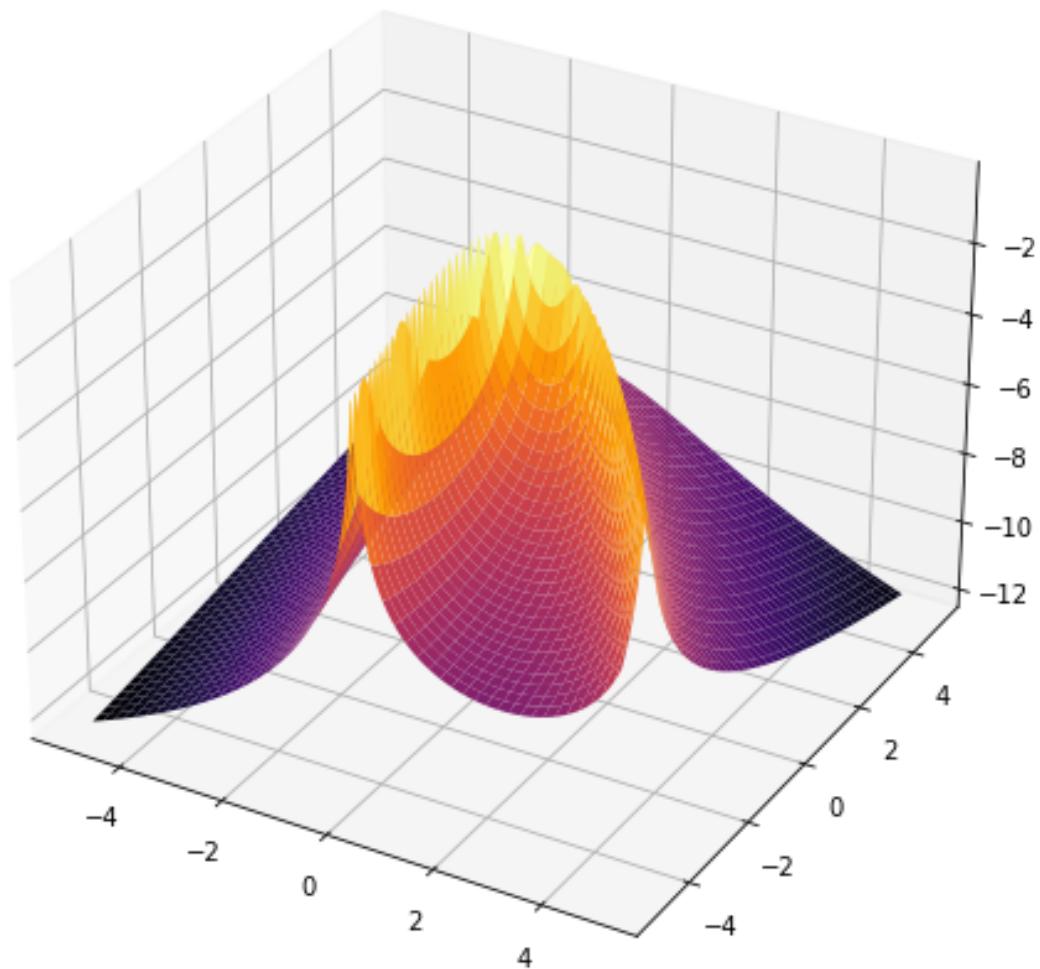
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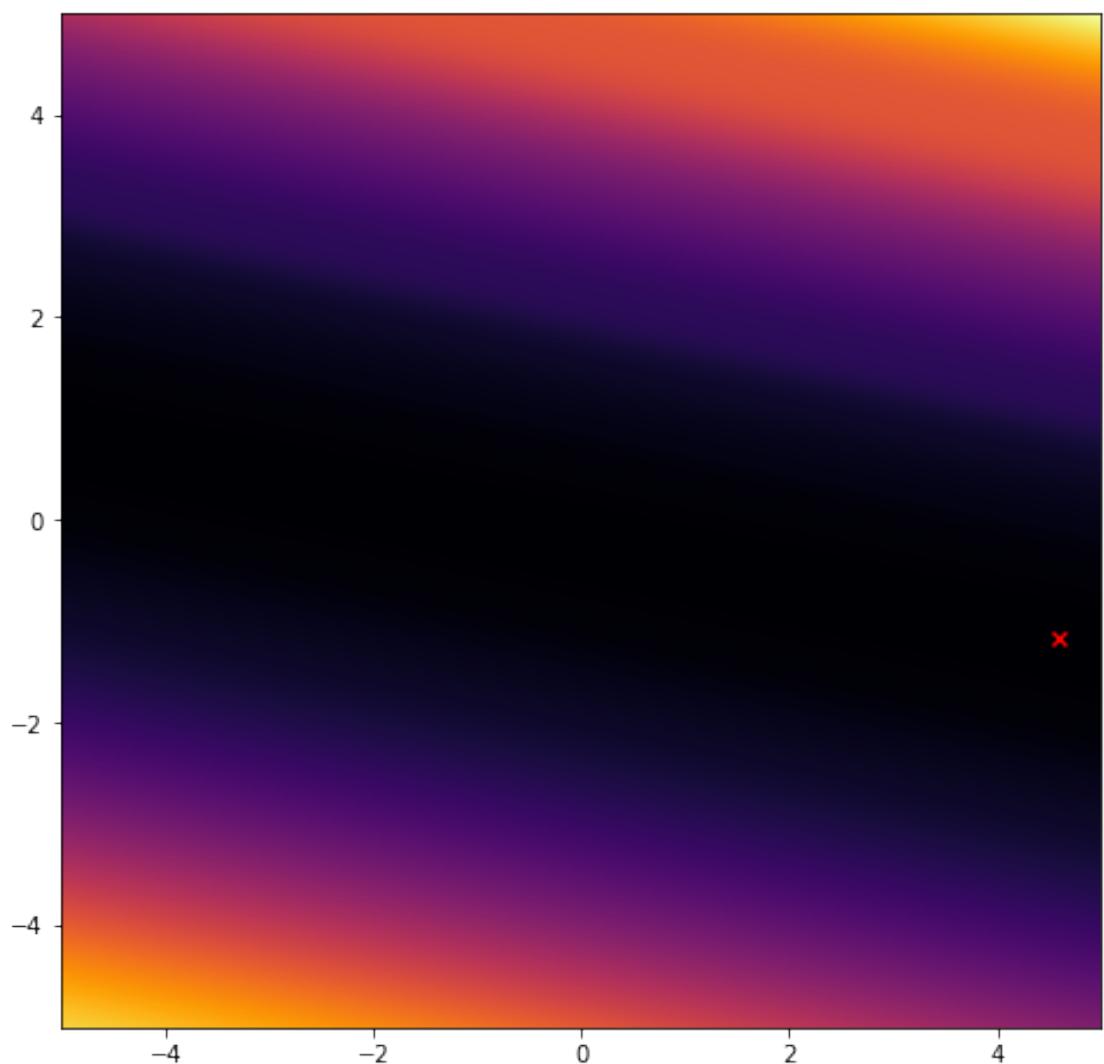
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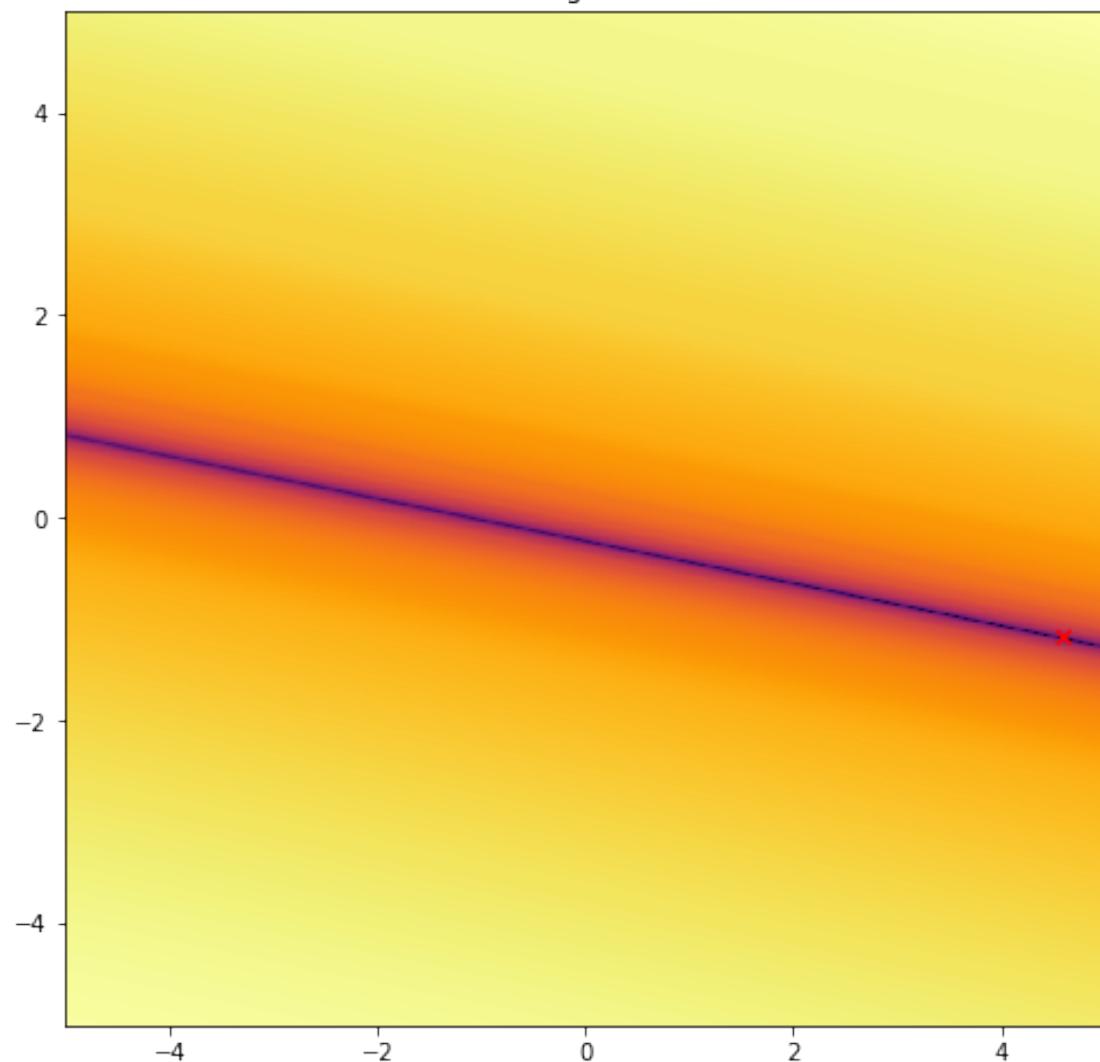
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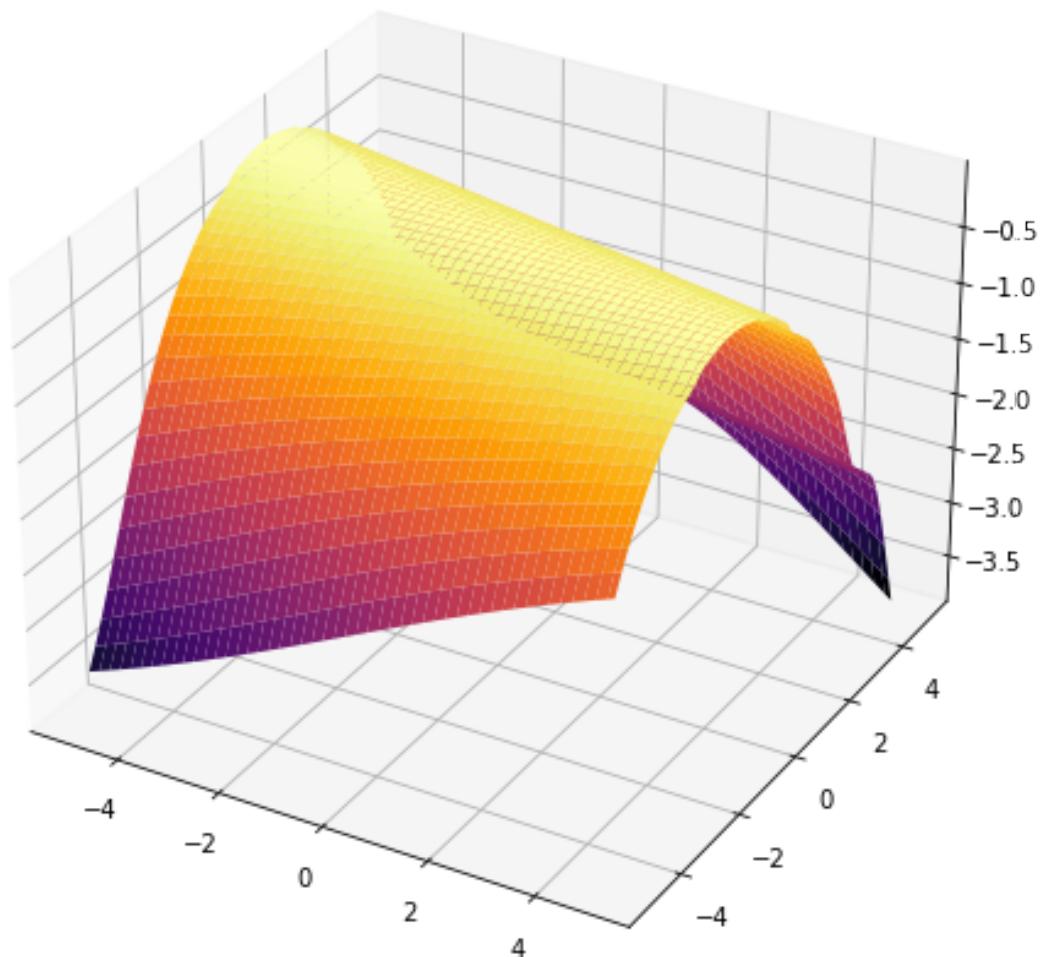
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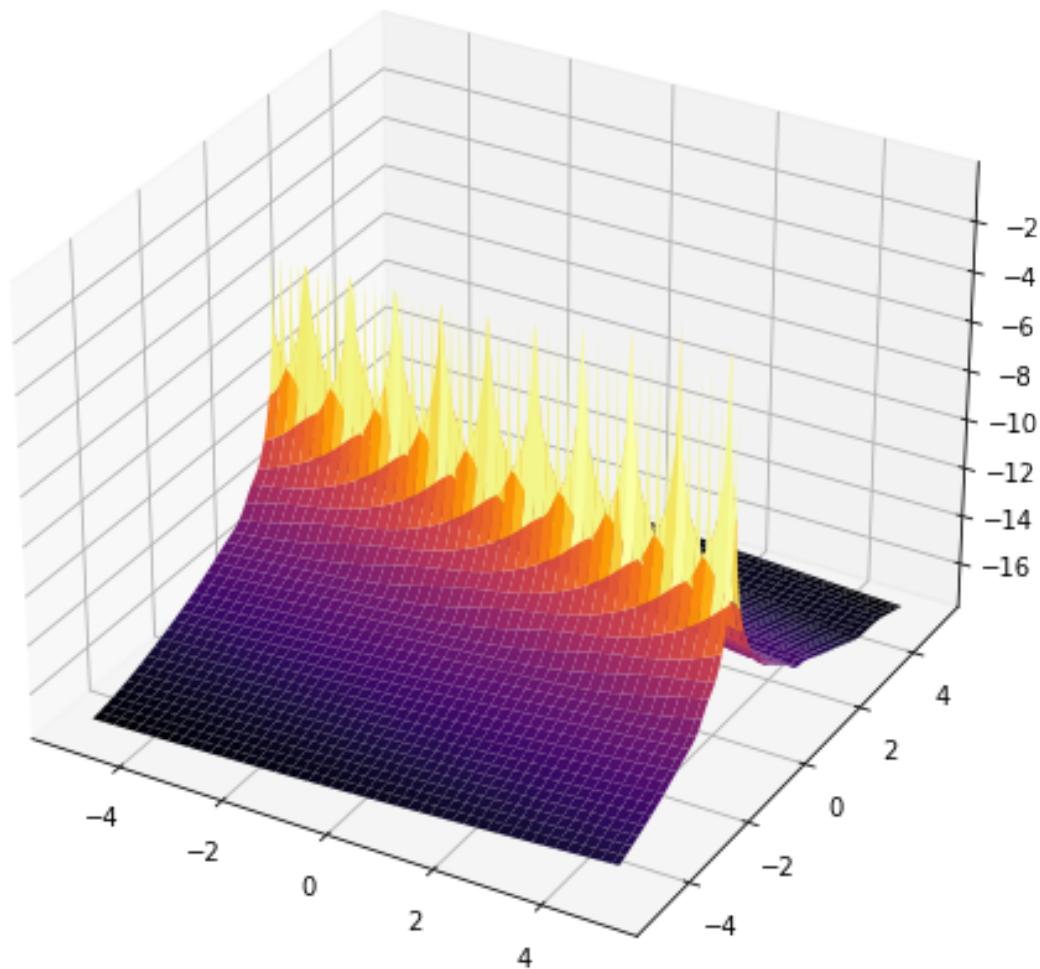
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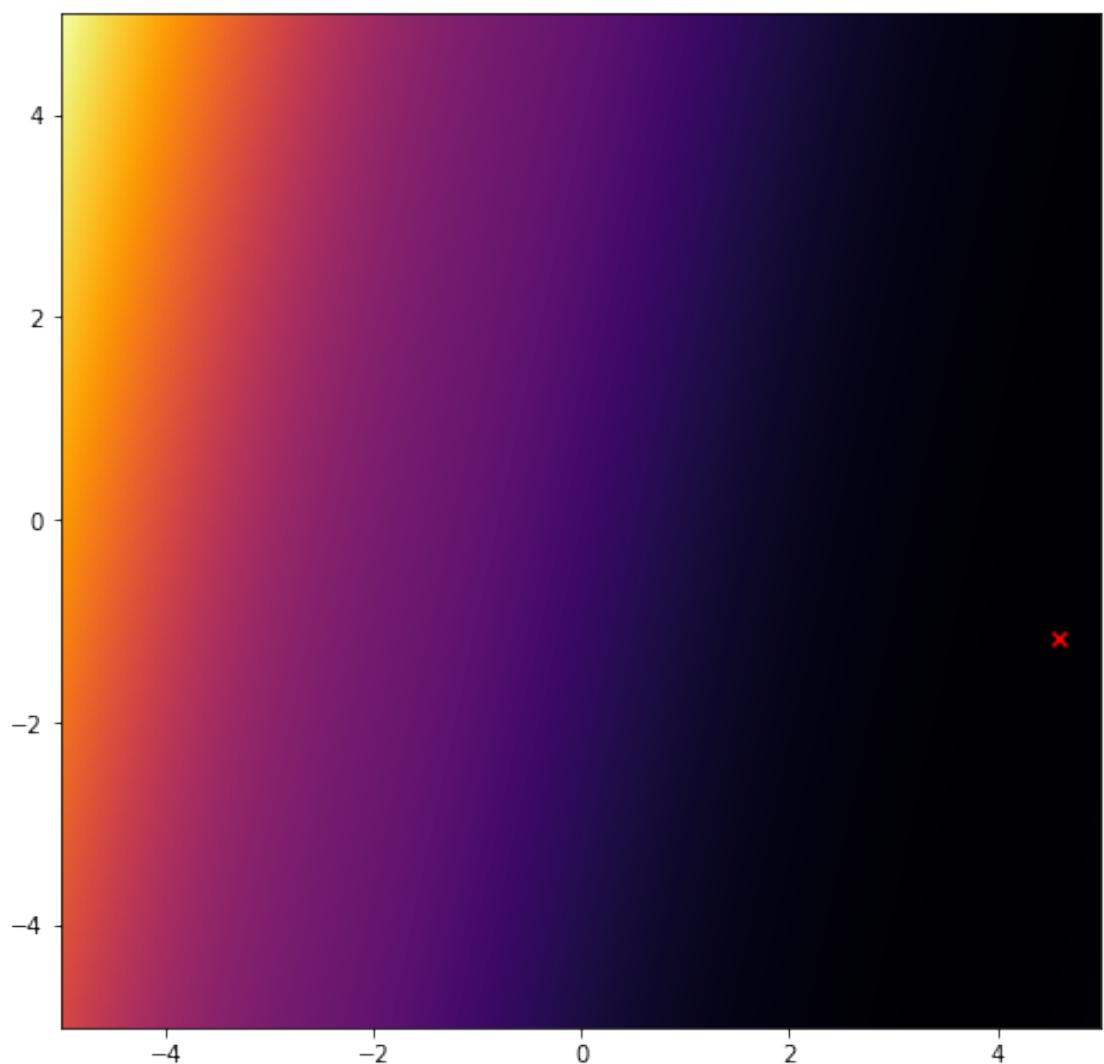
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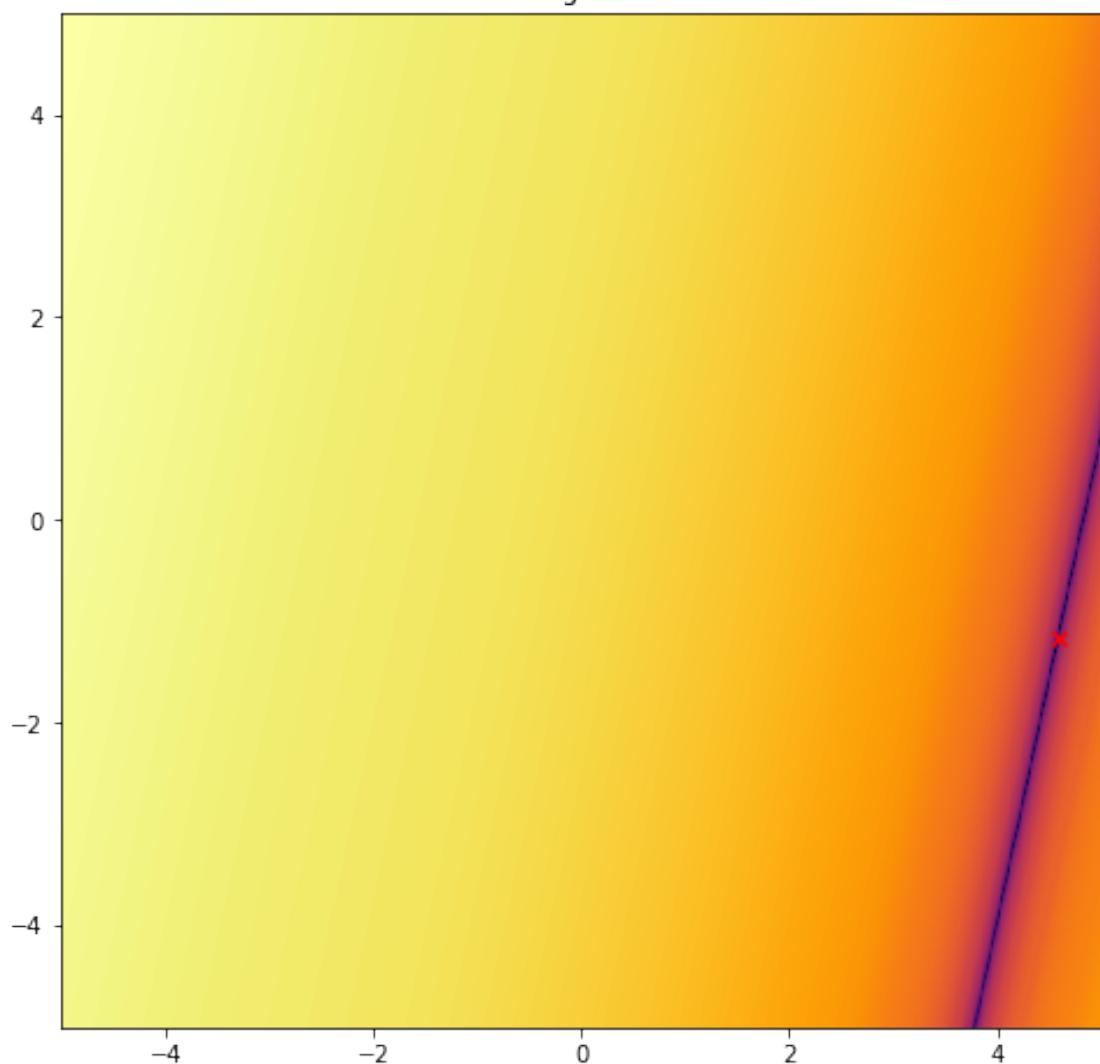
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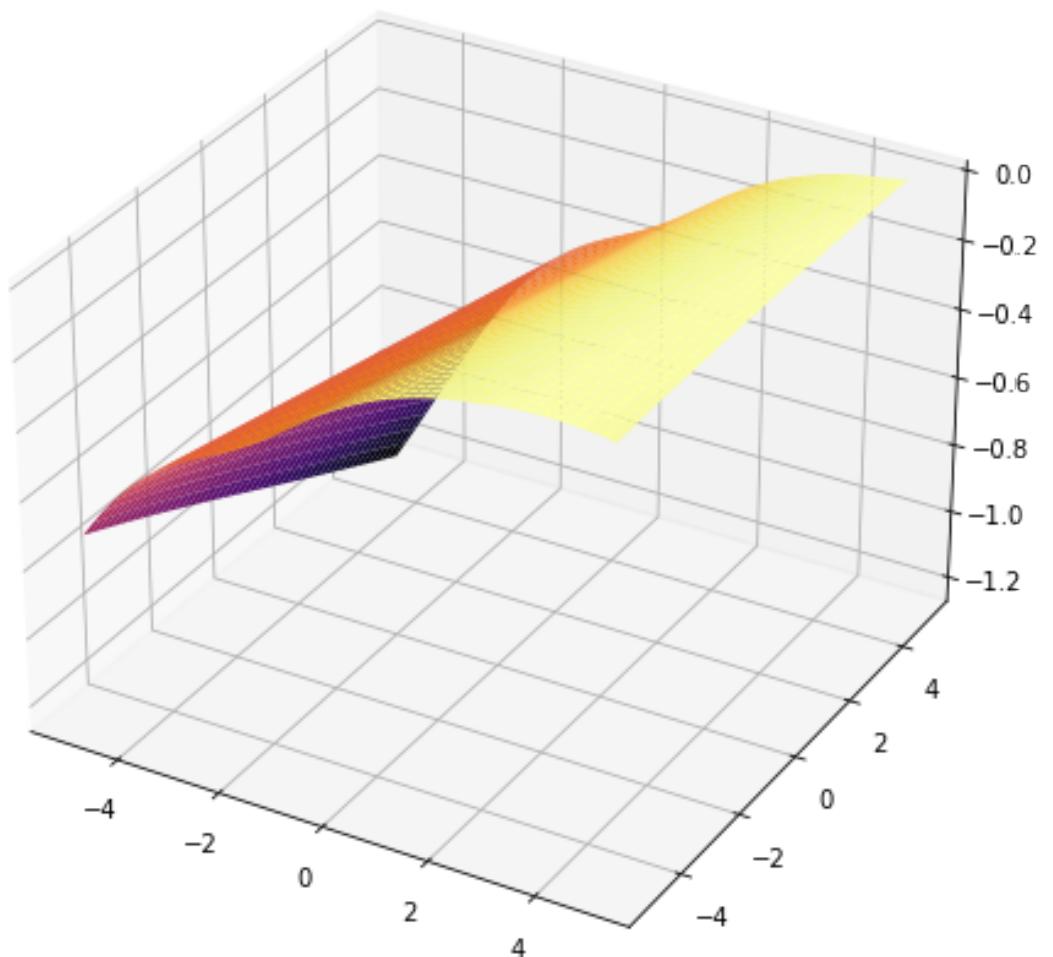
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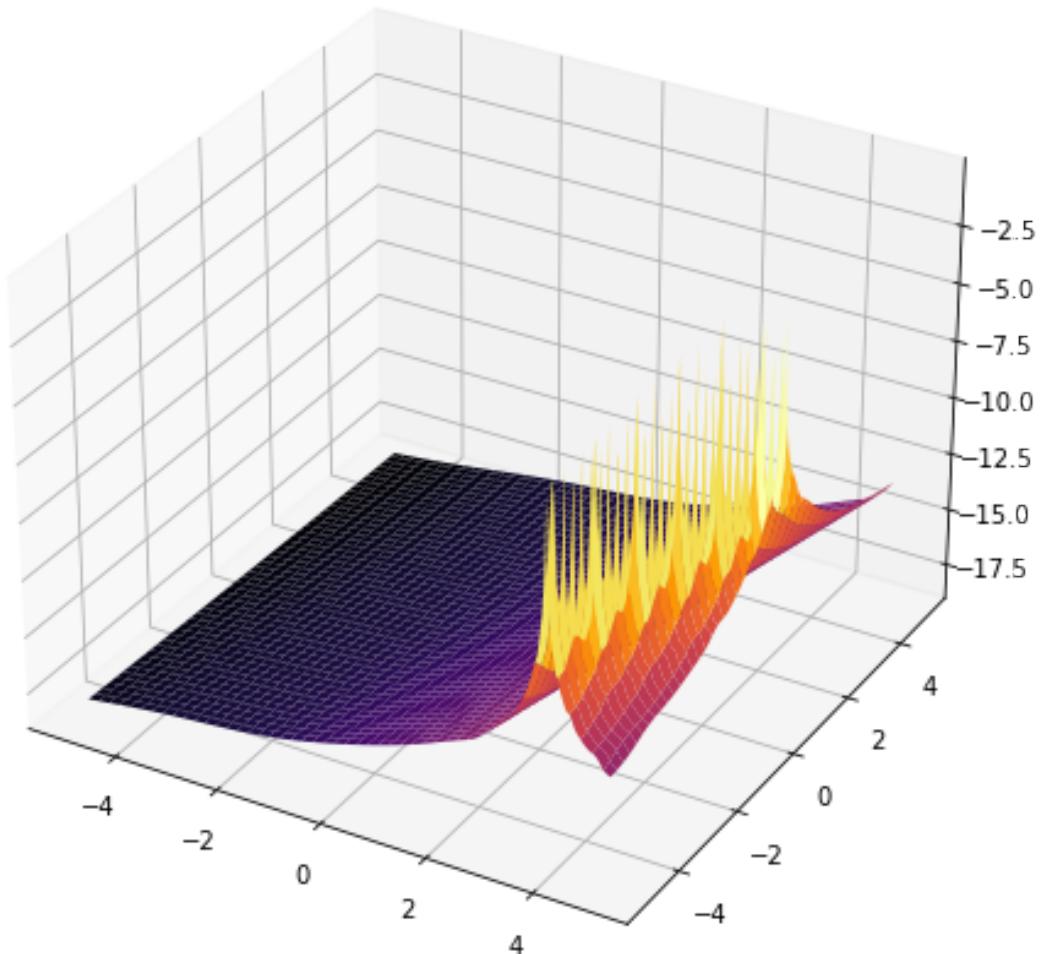
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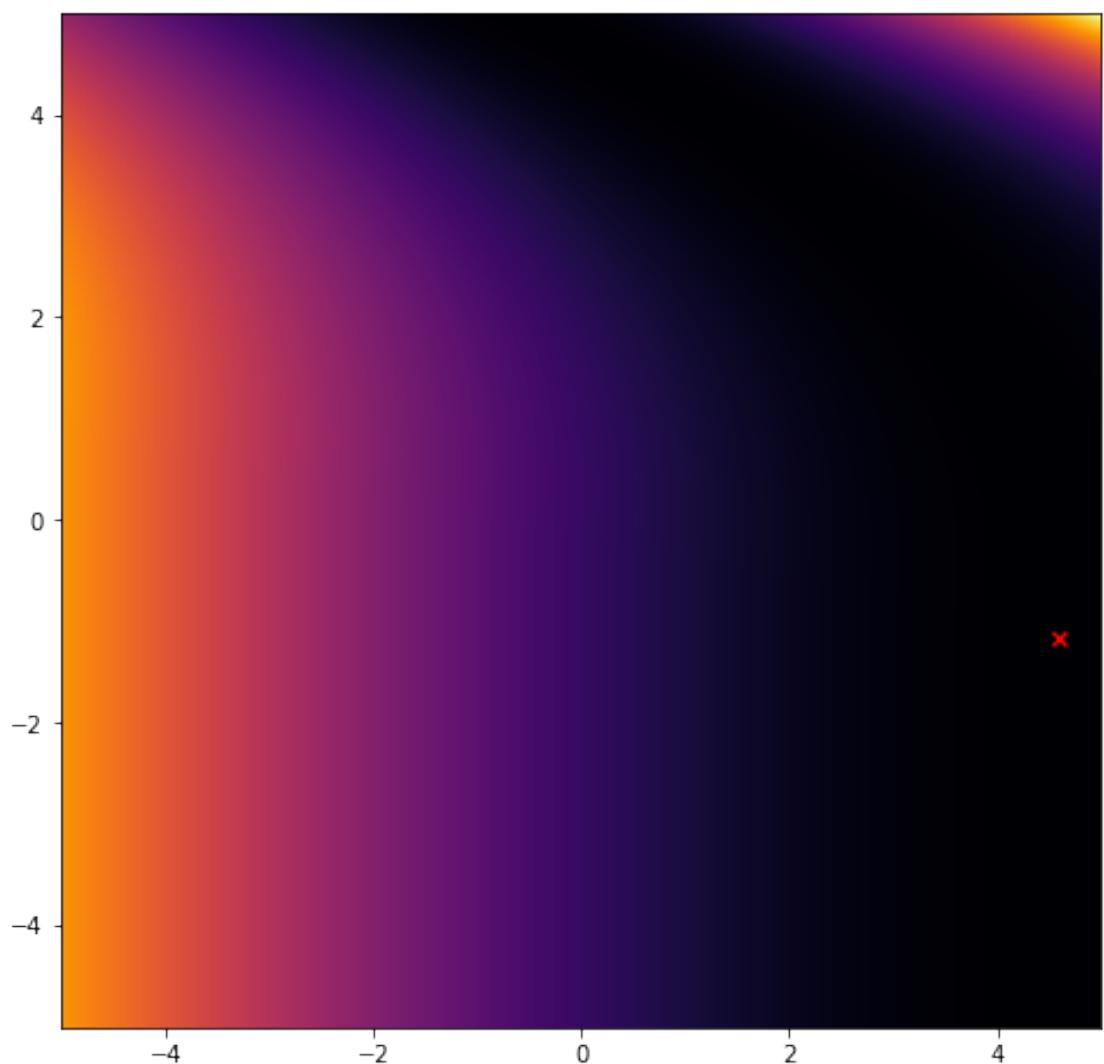
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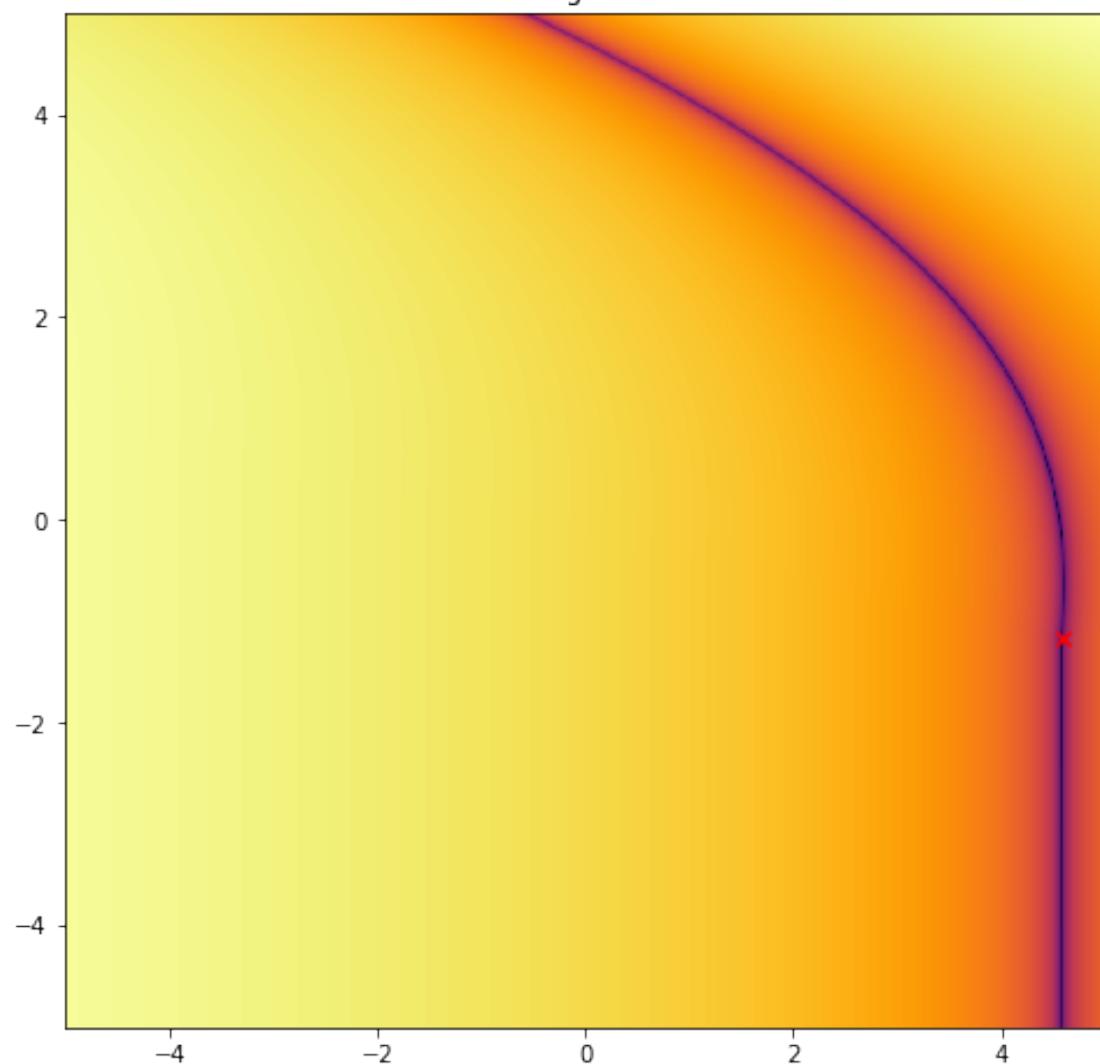
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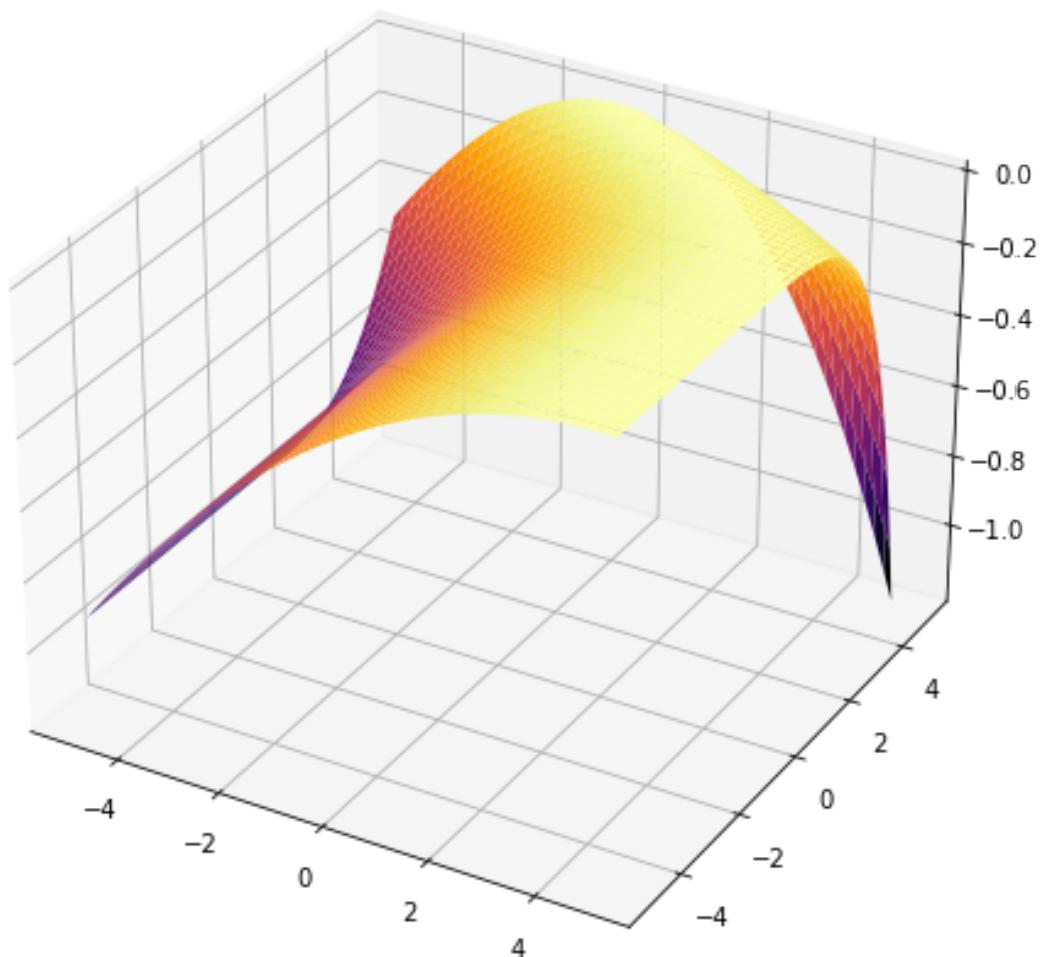
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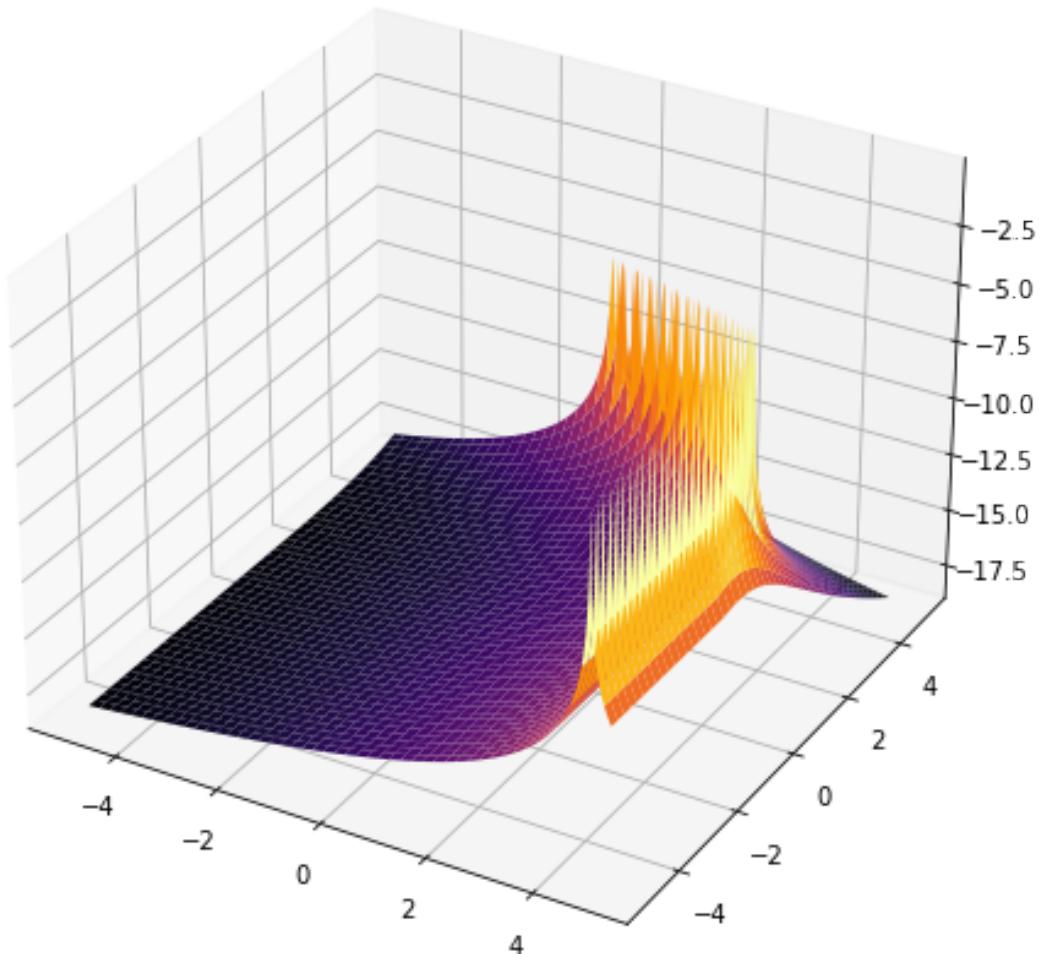
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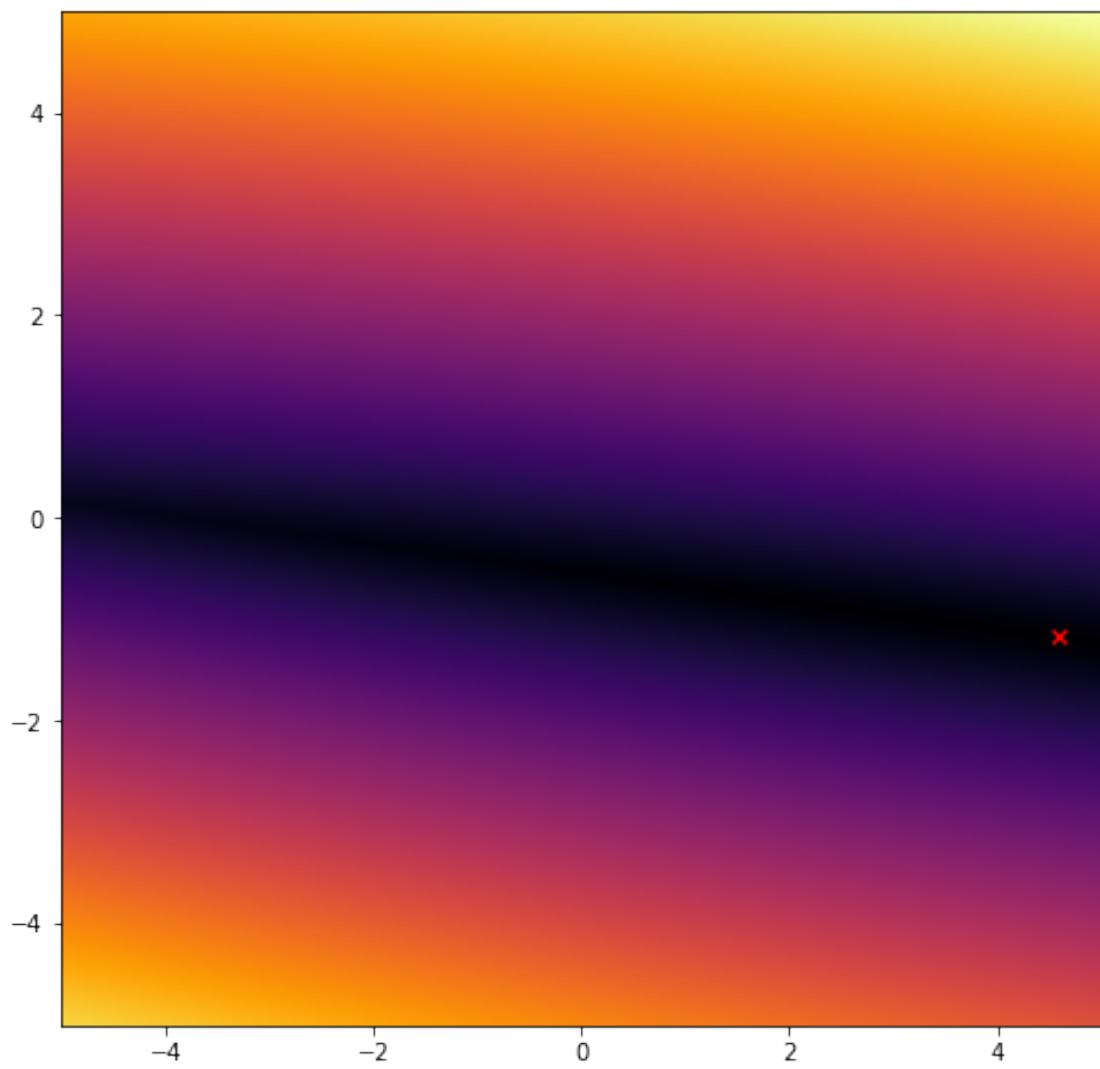
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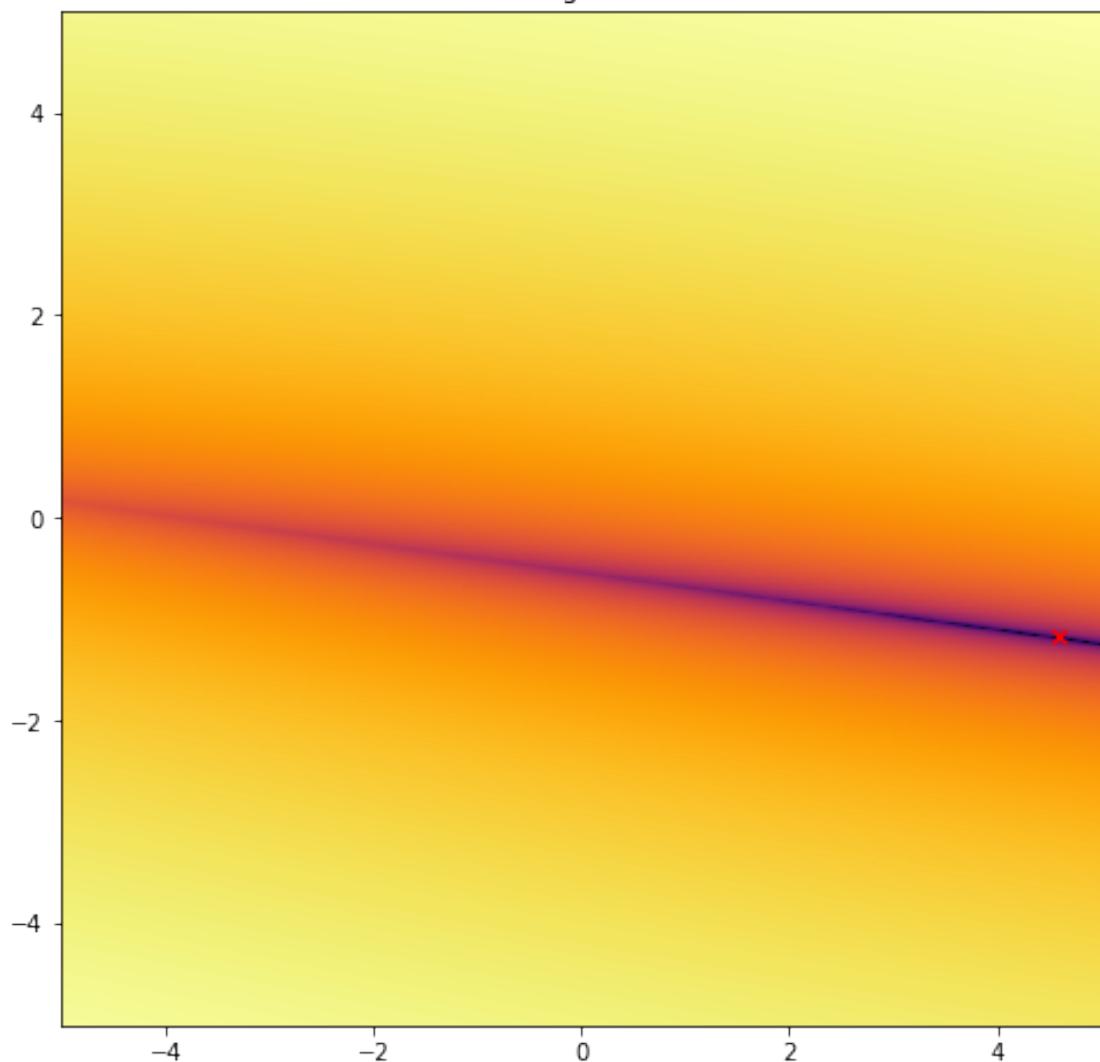
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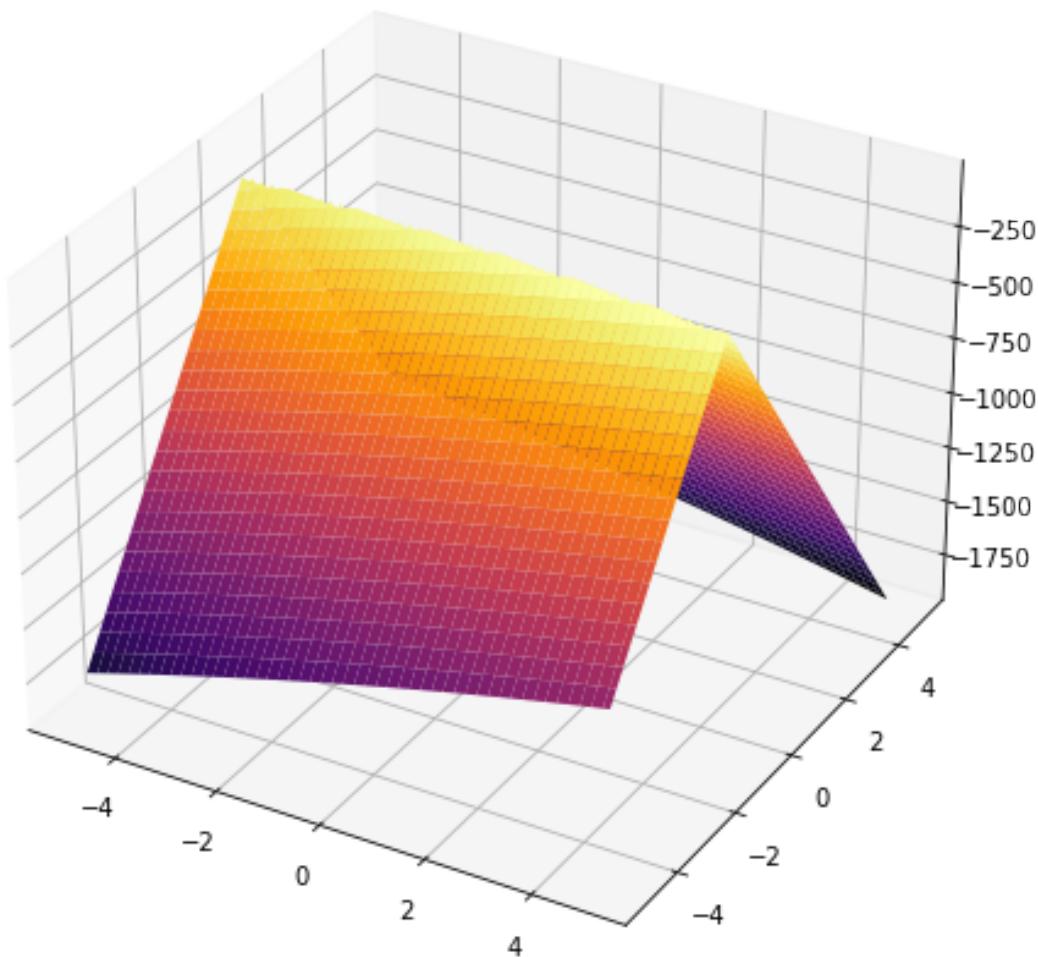
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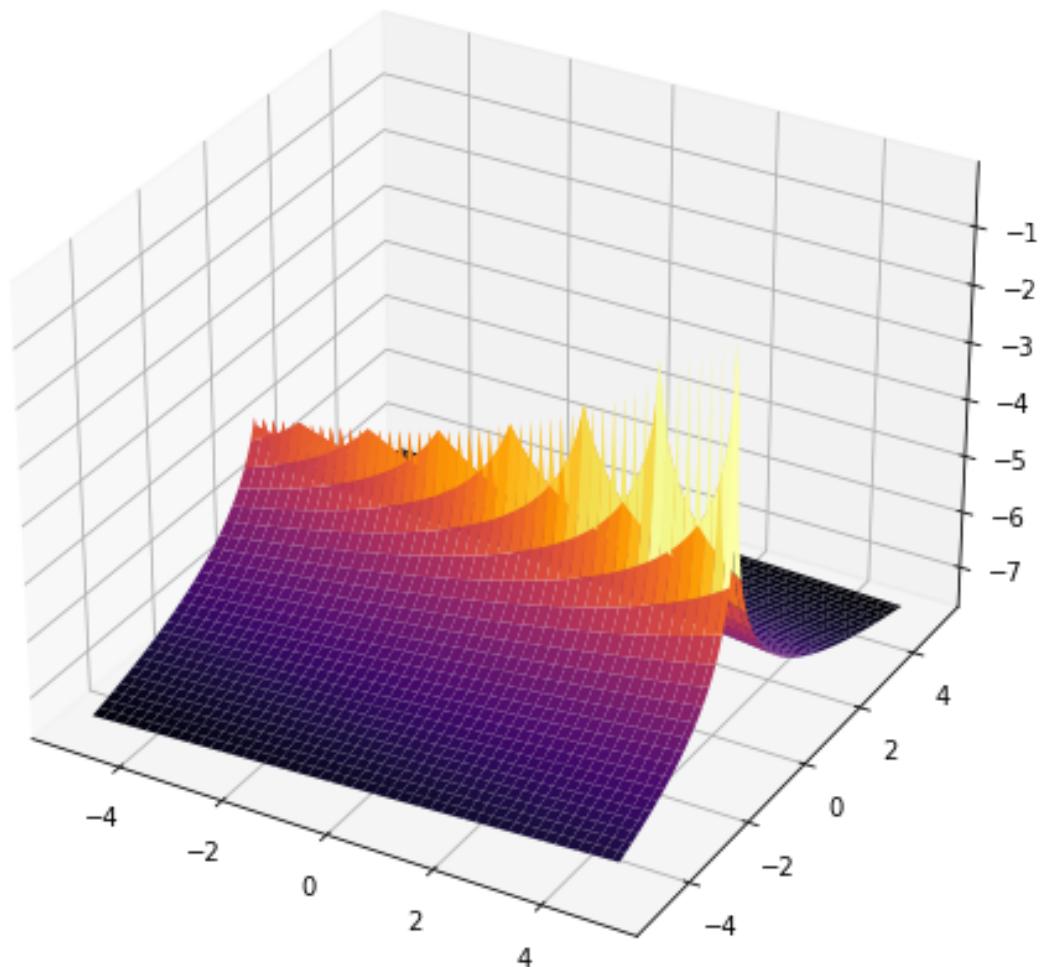
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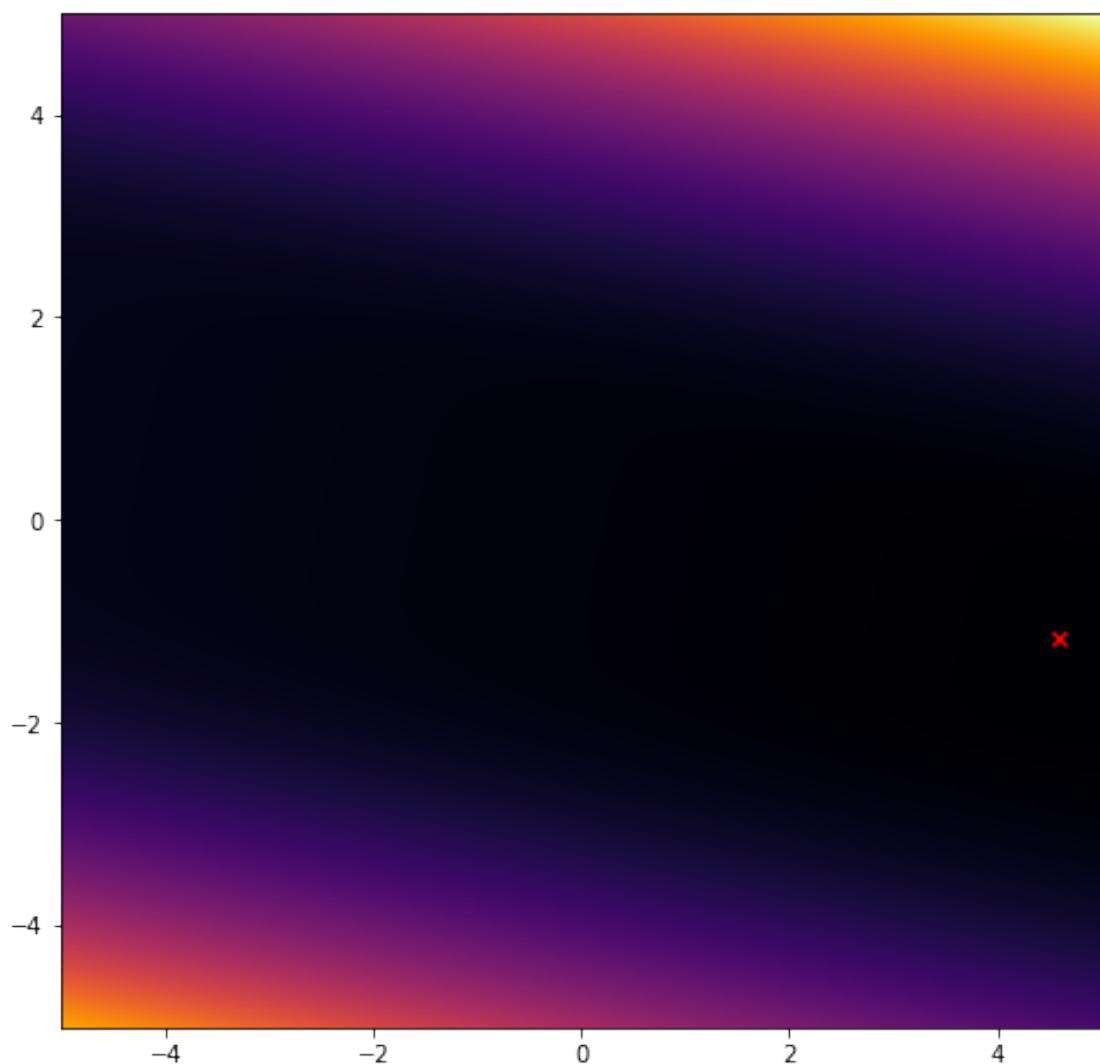
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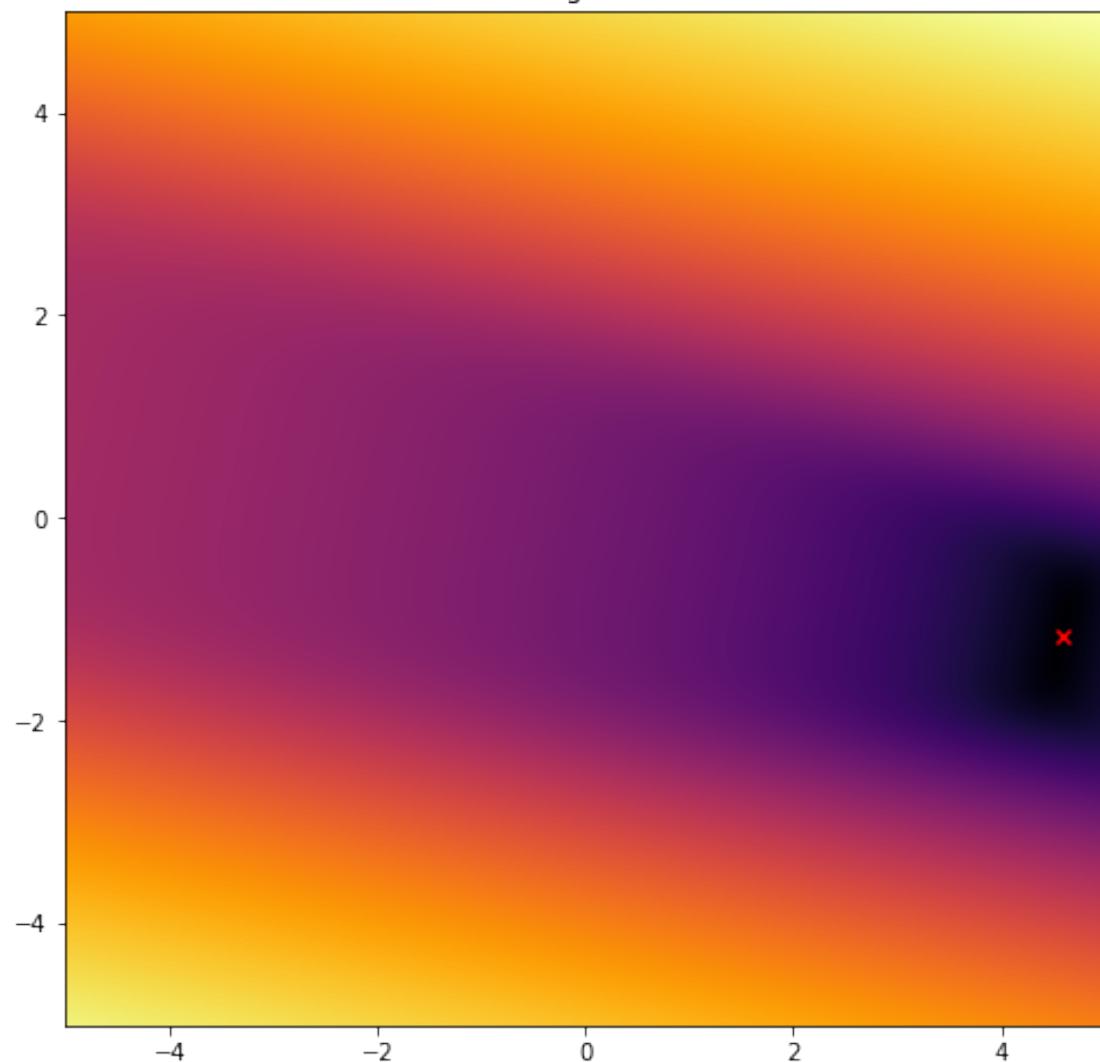
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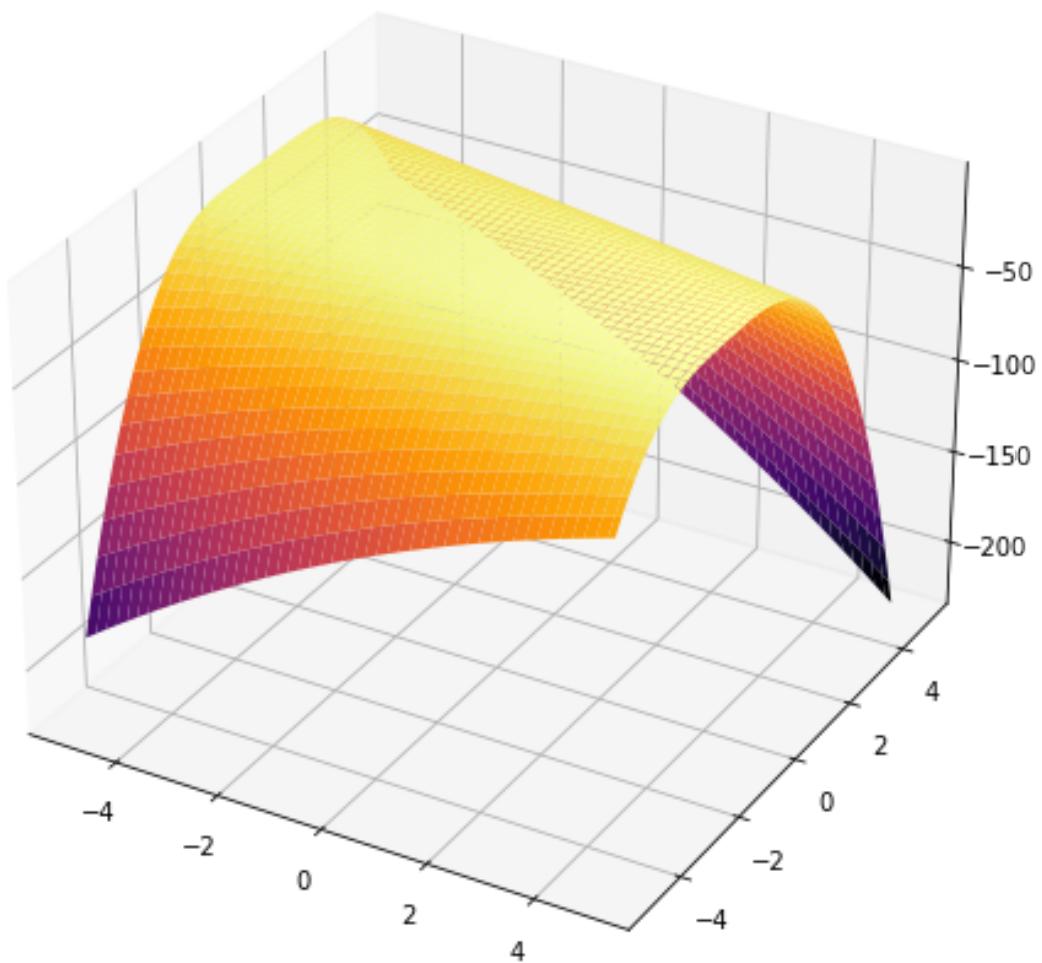
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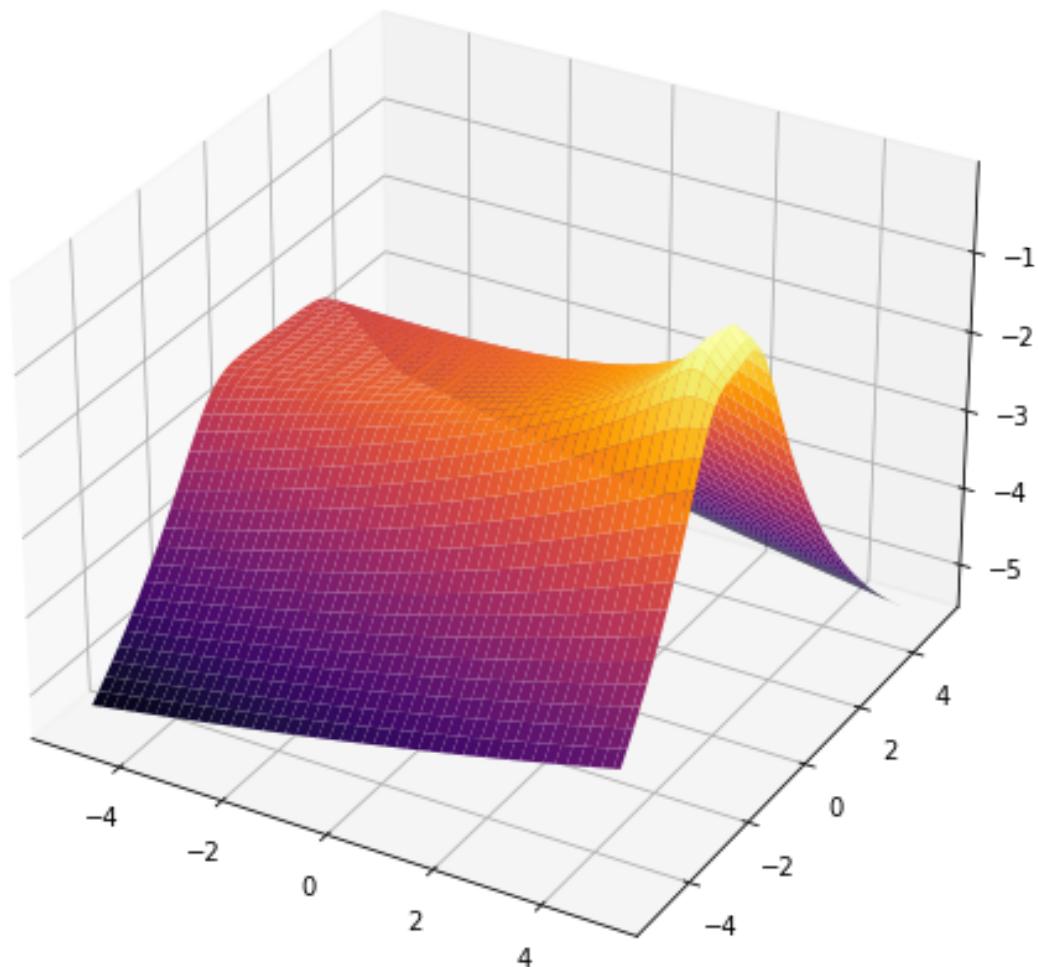
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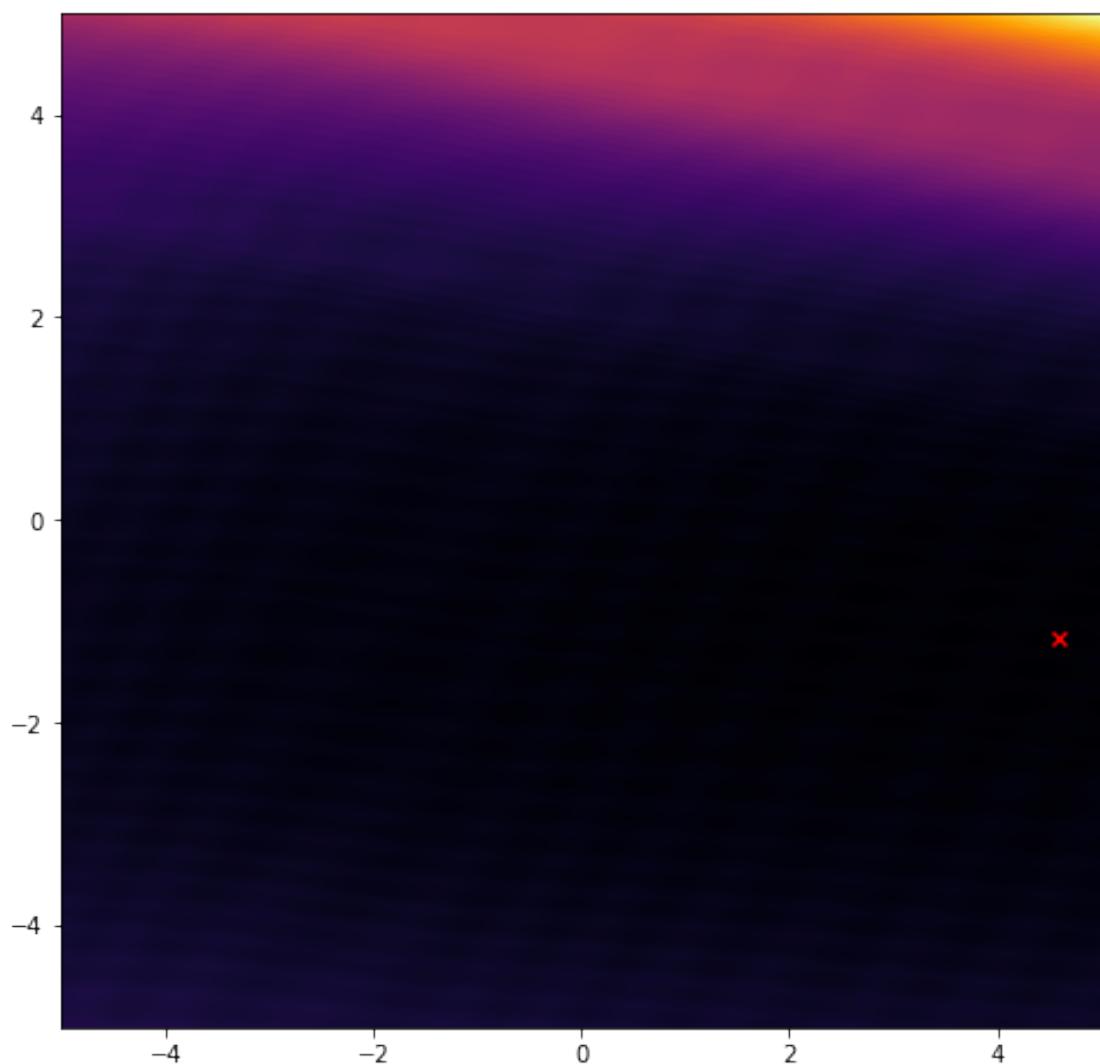
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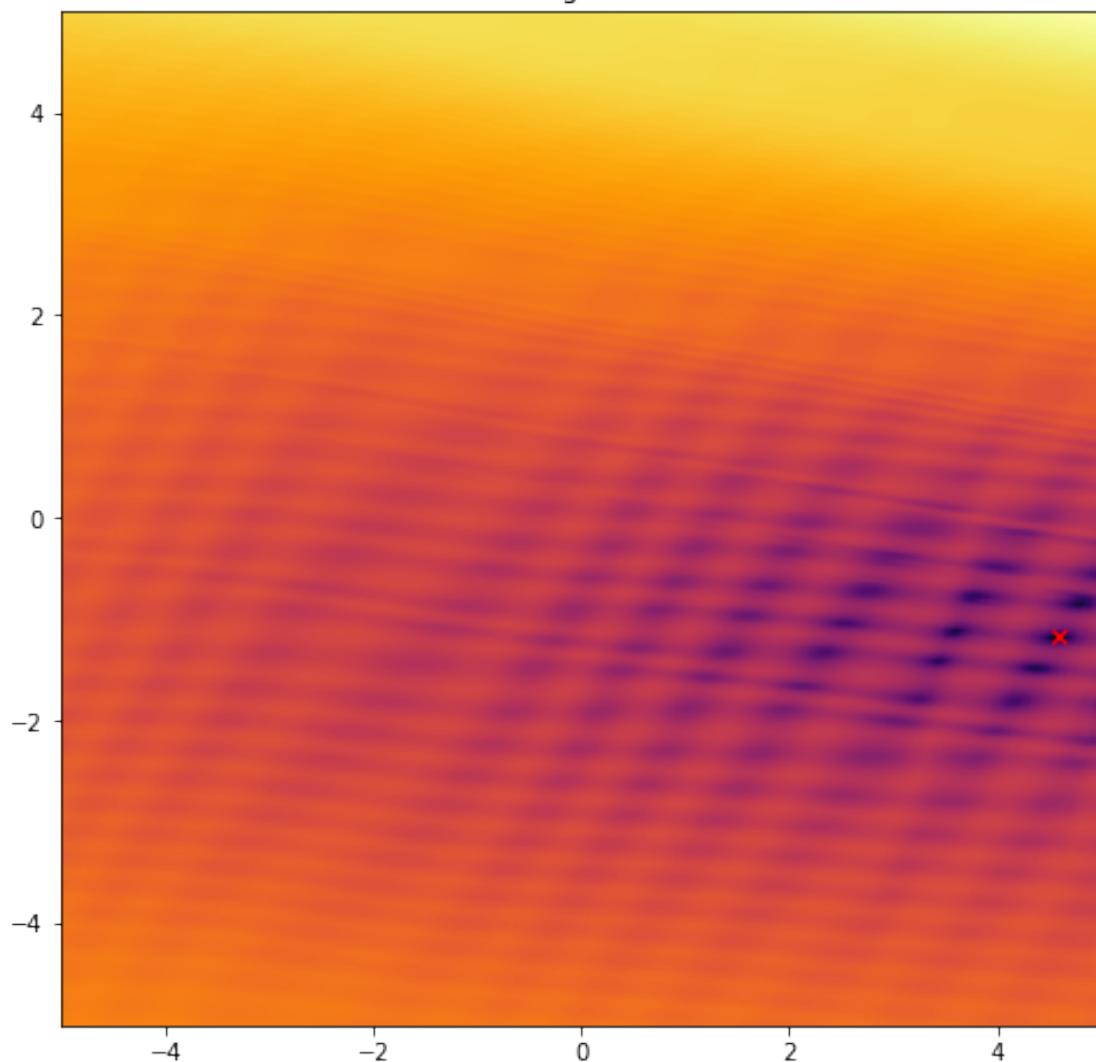
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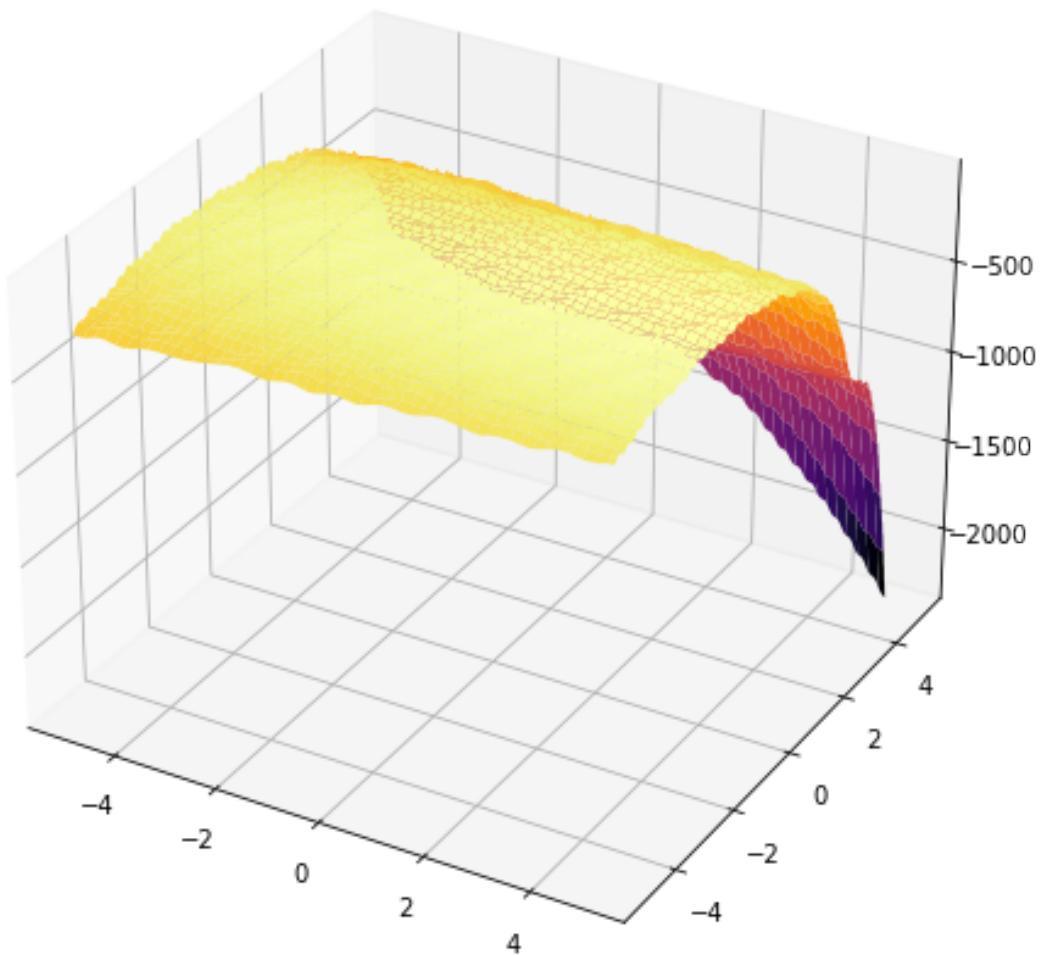
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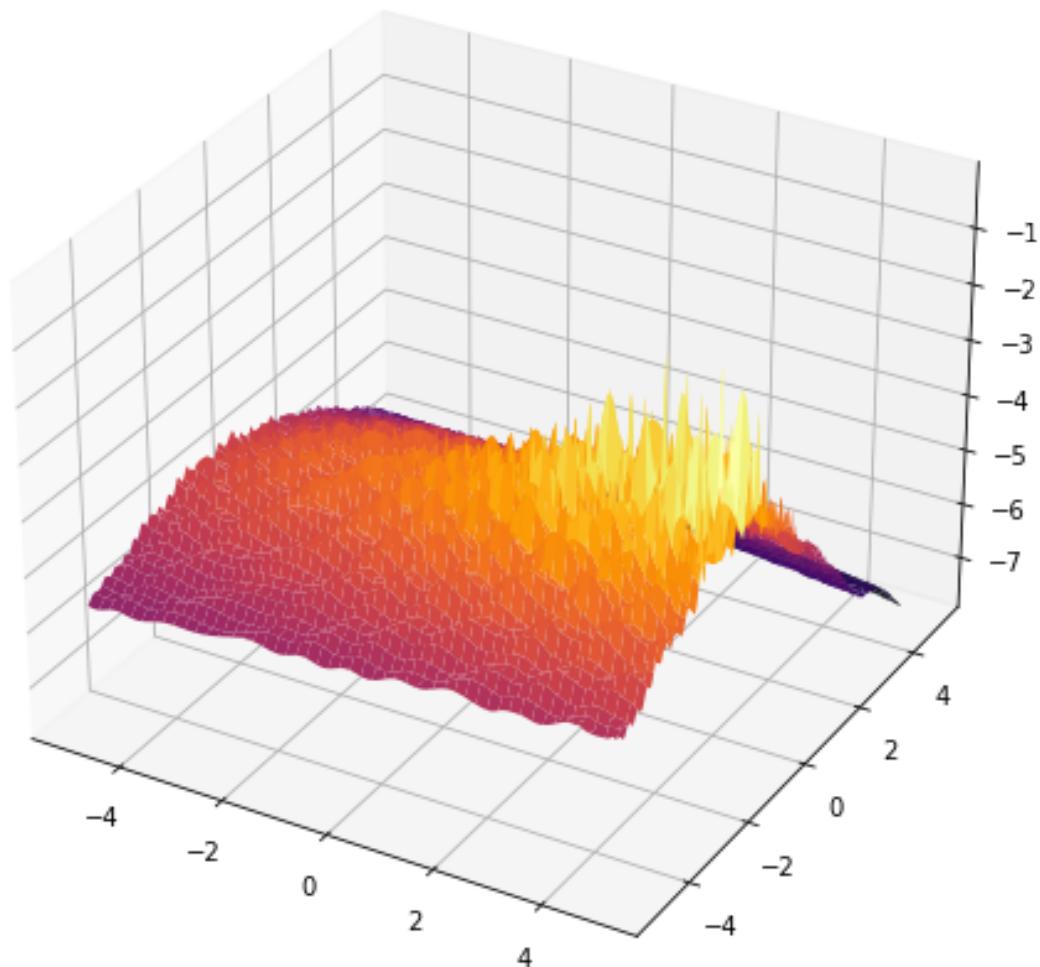
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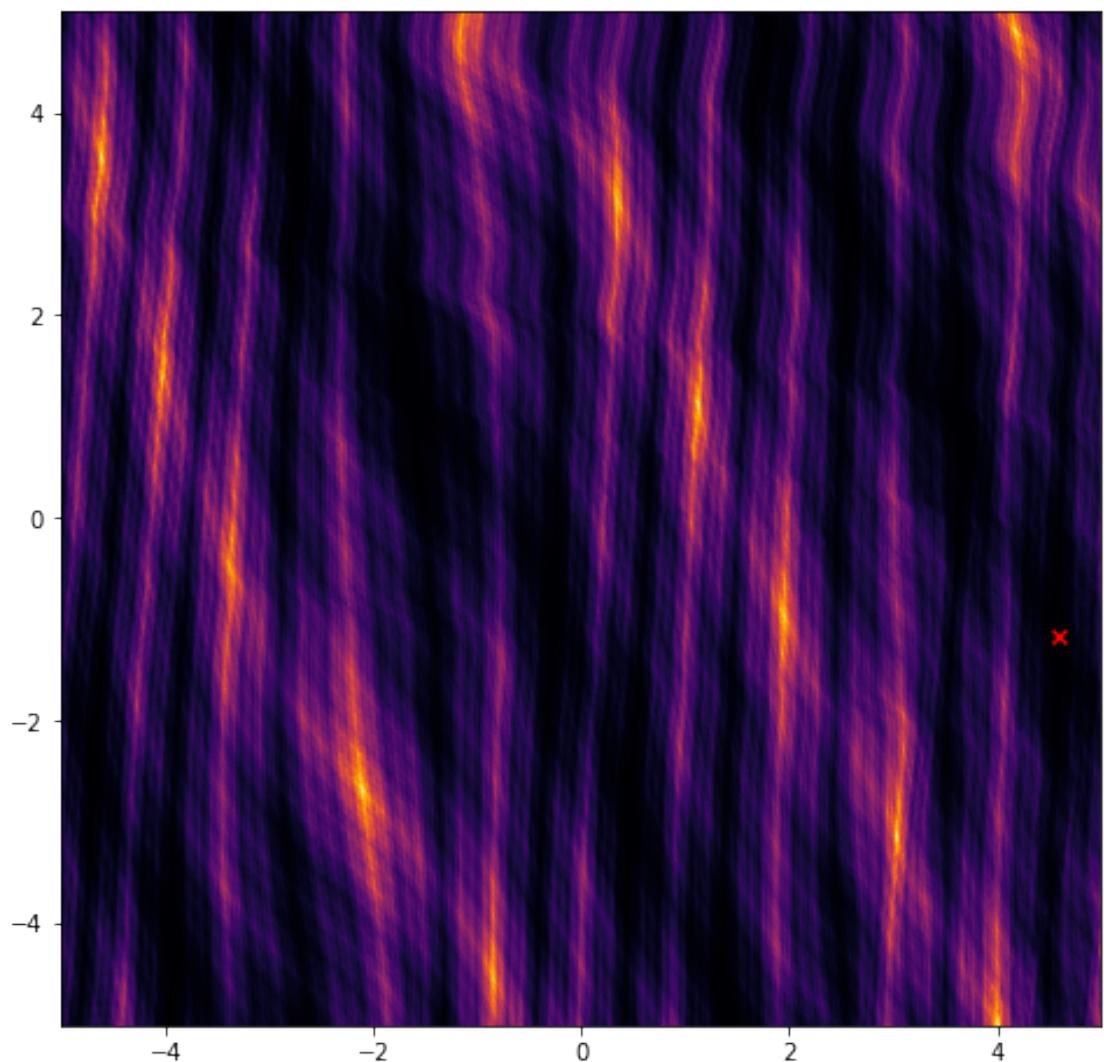
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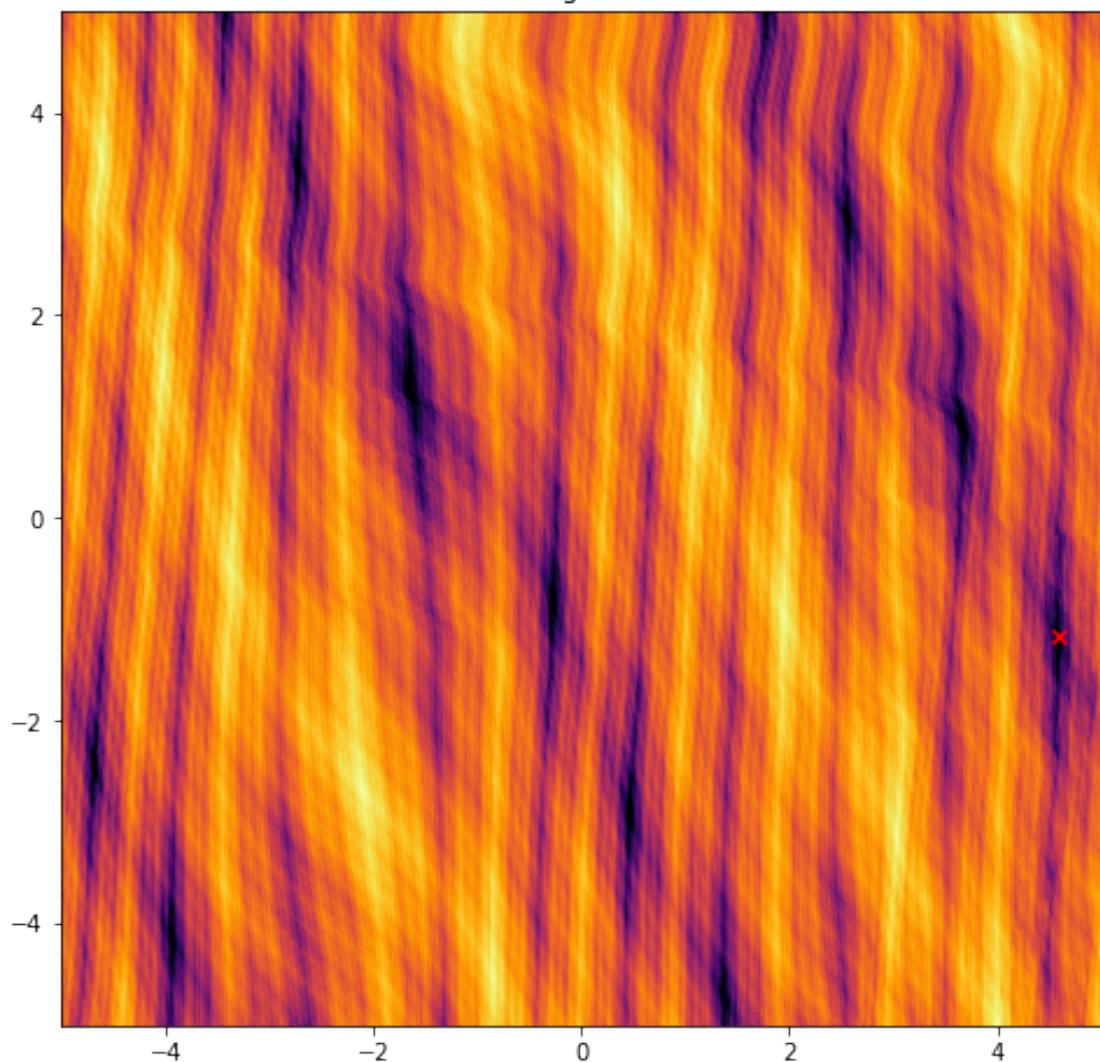
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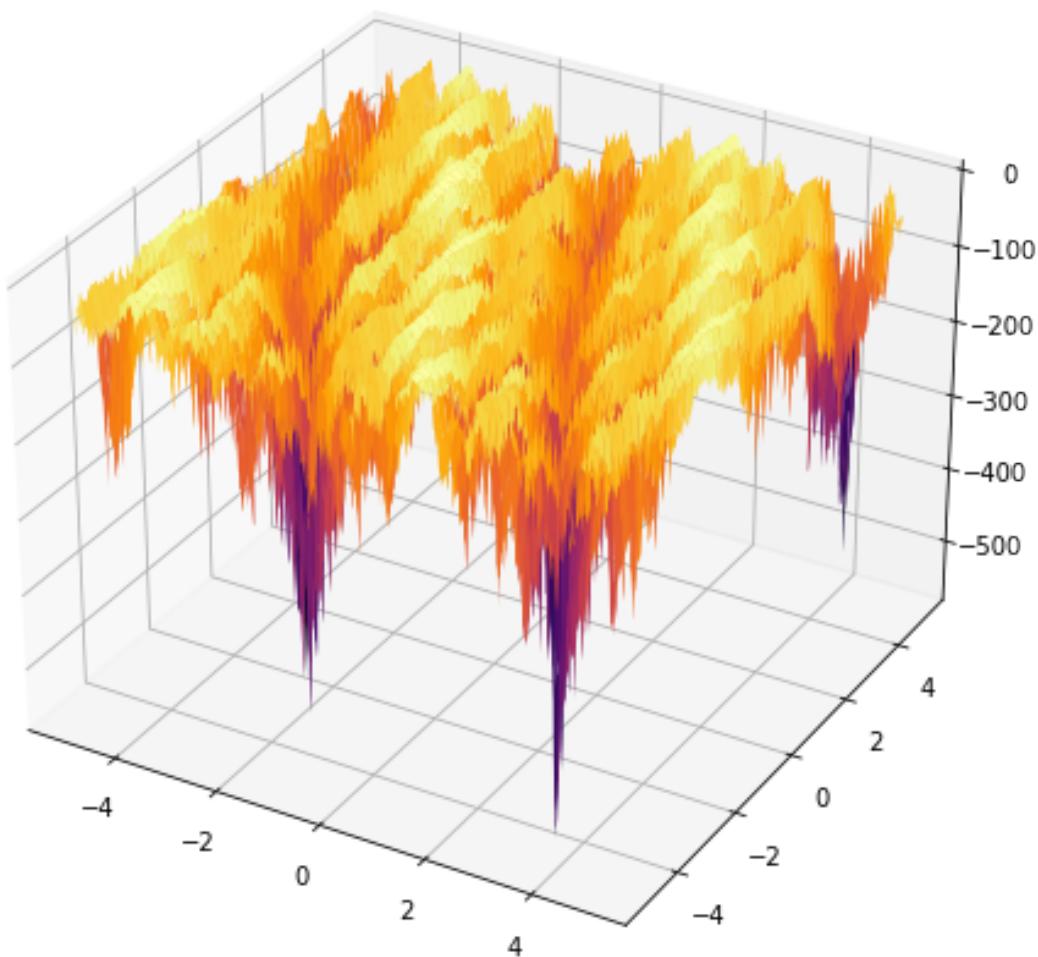
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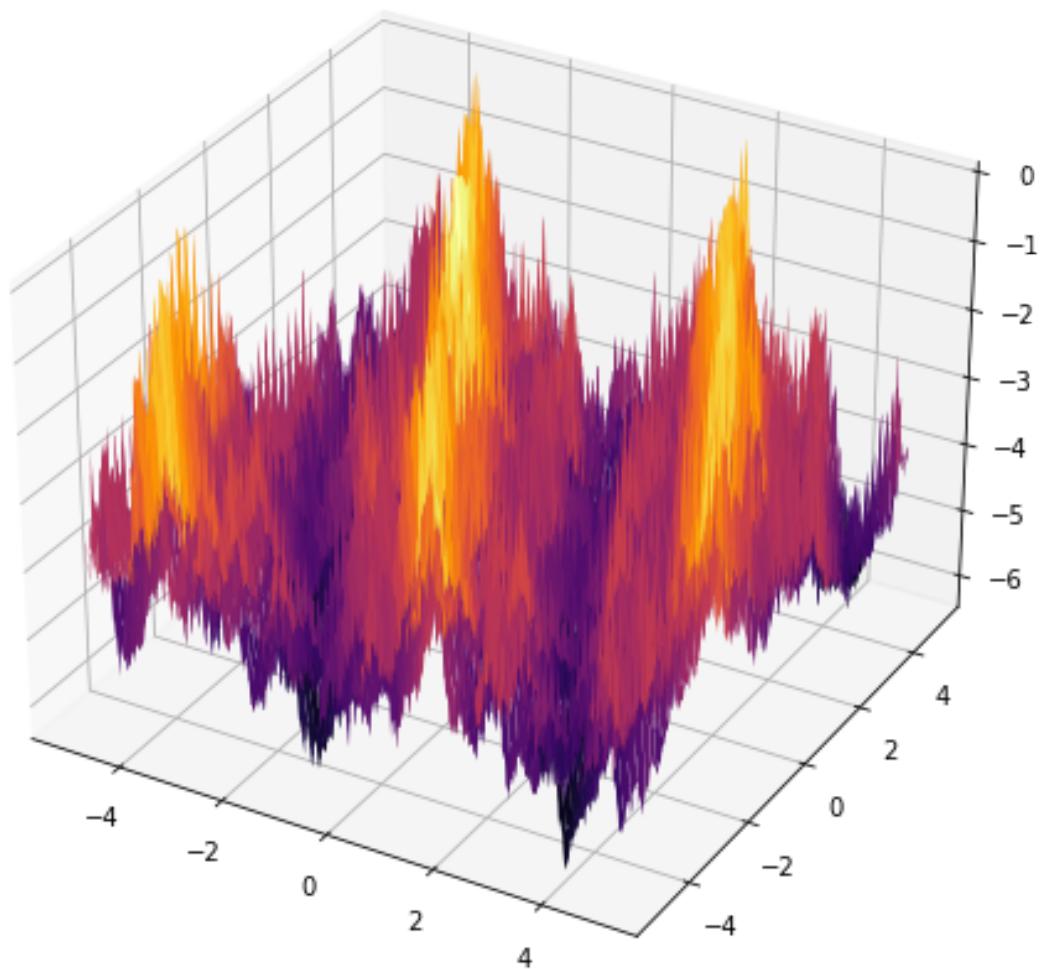
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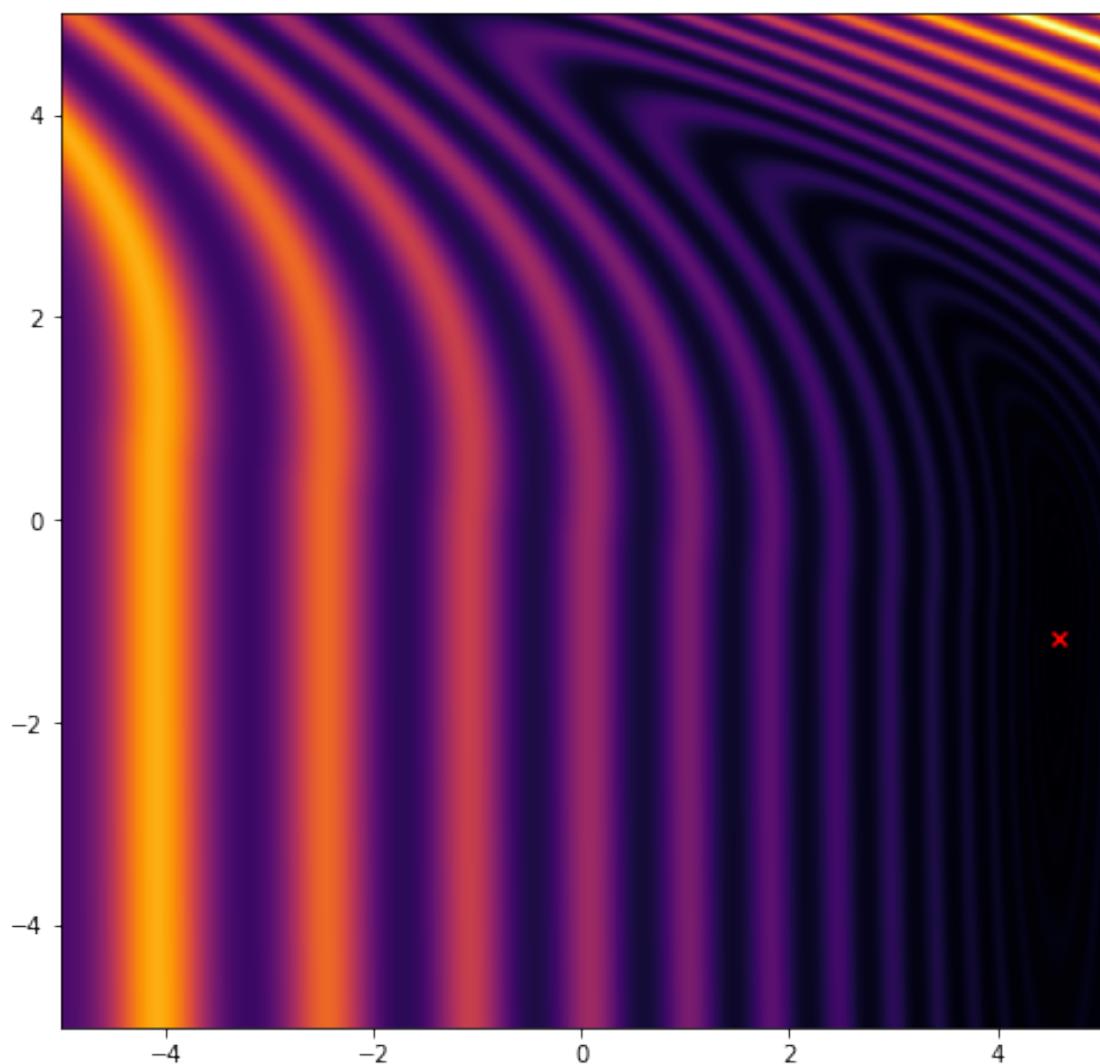
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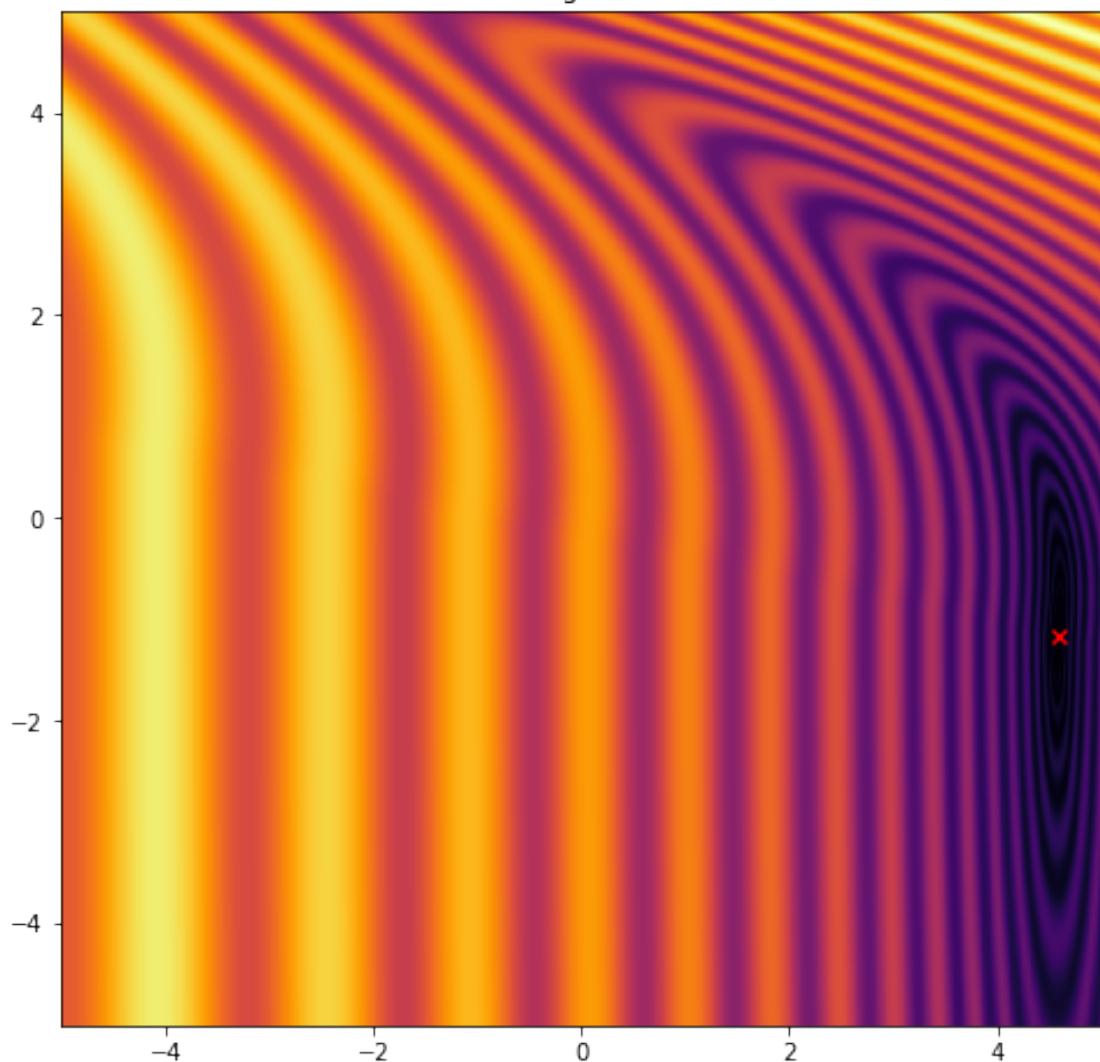
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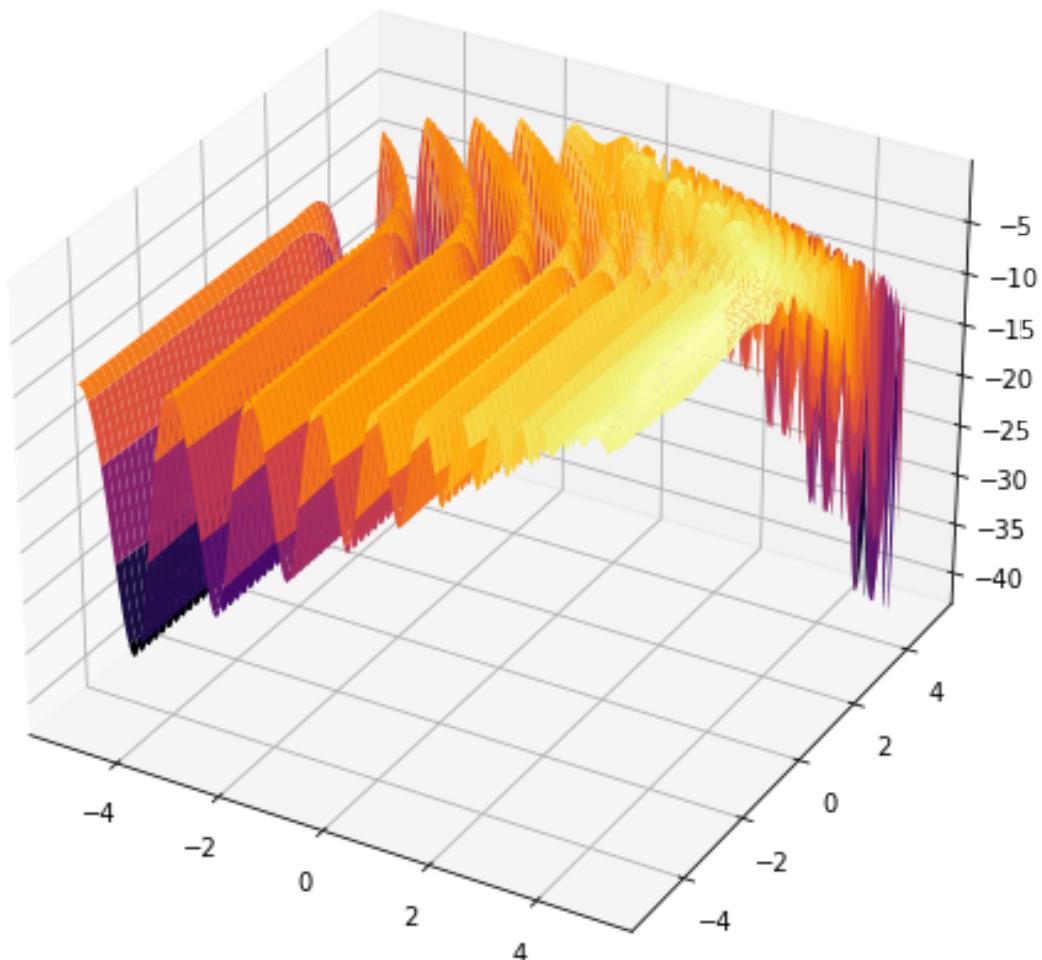
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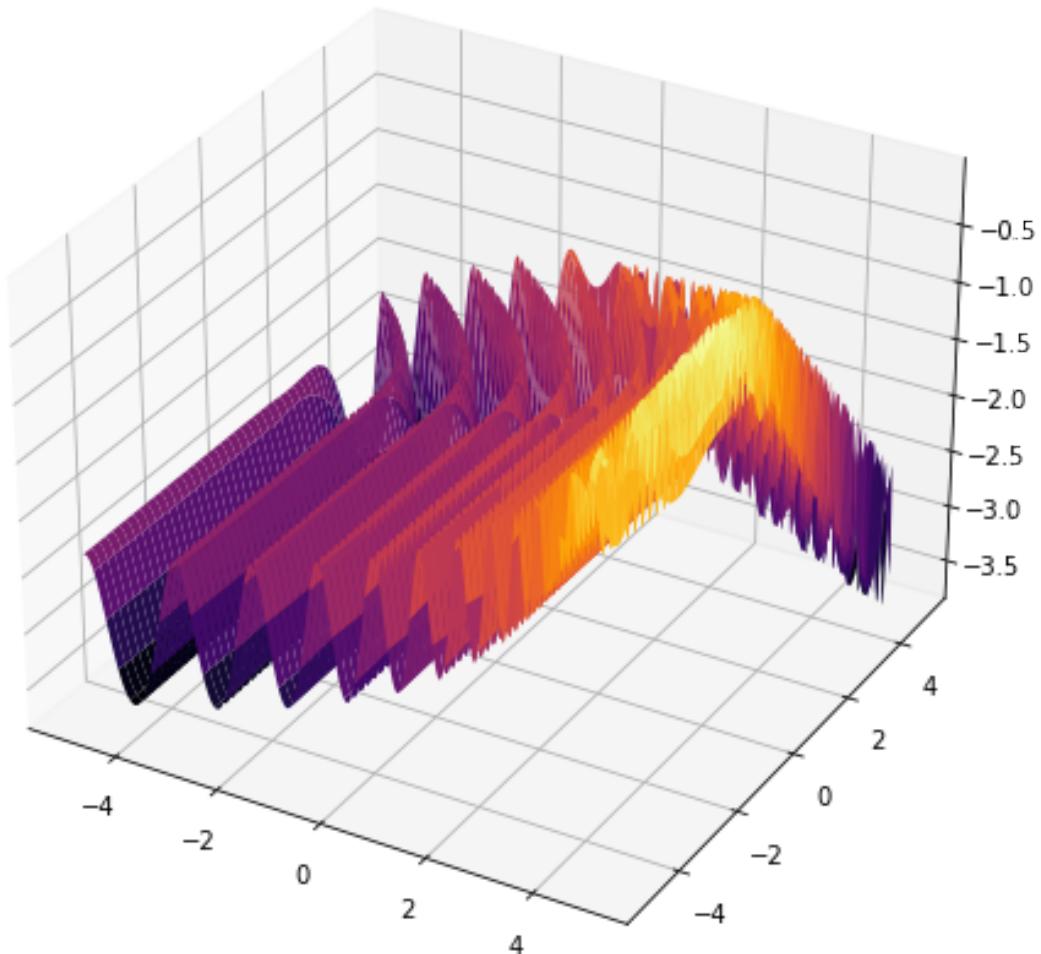
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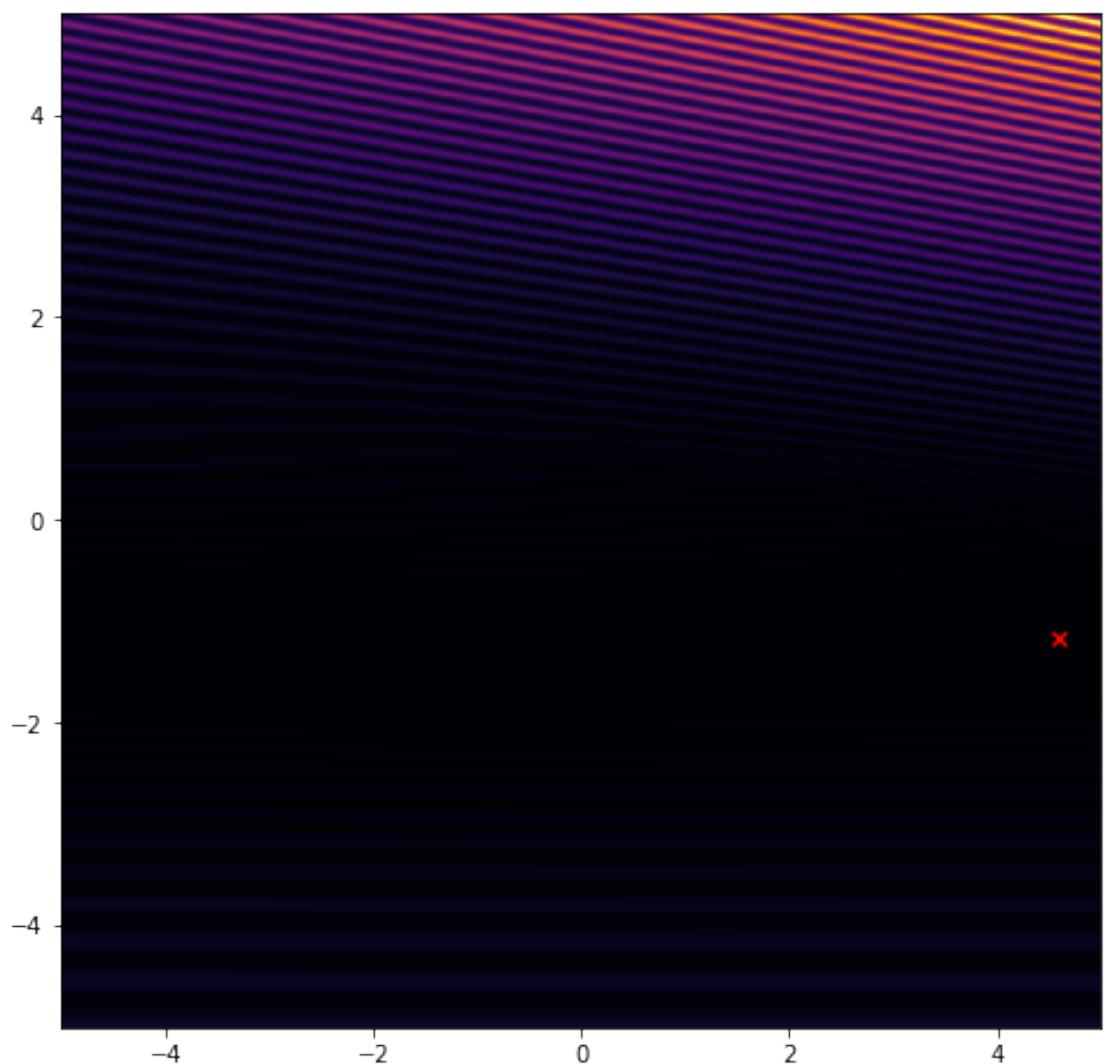
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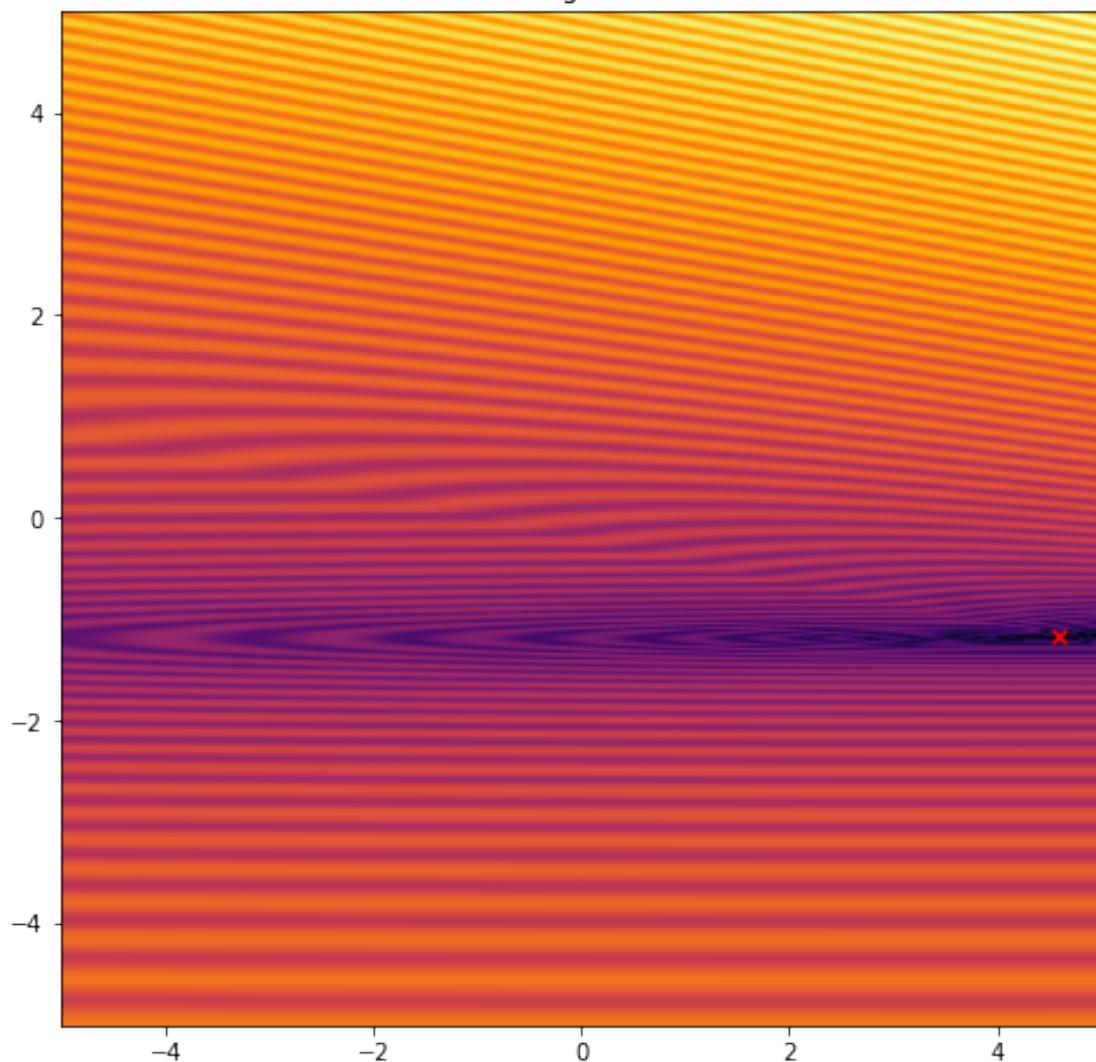
f17 log3D



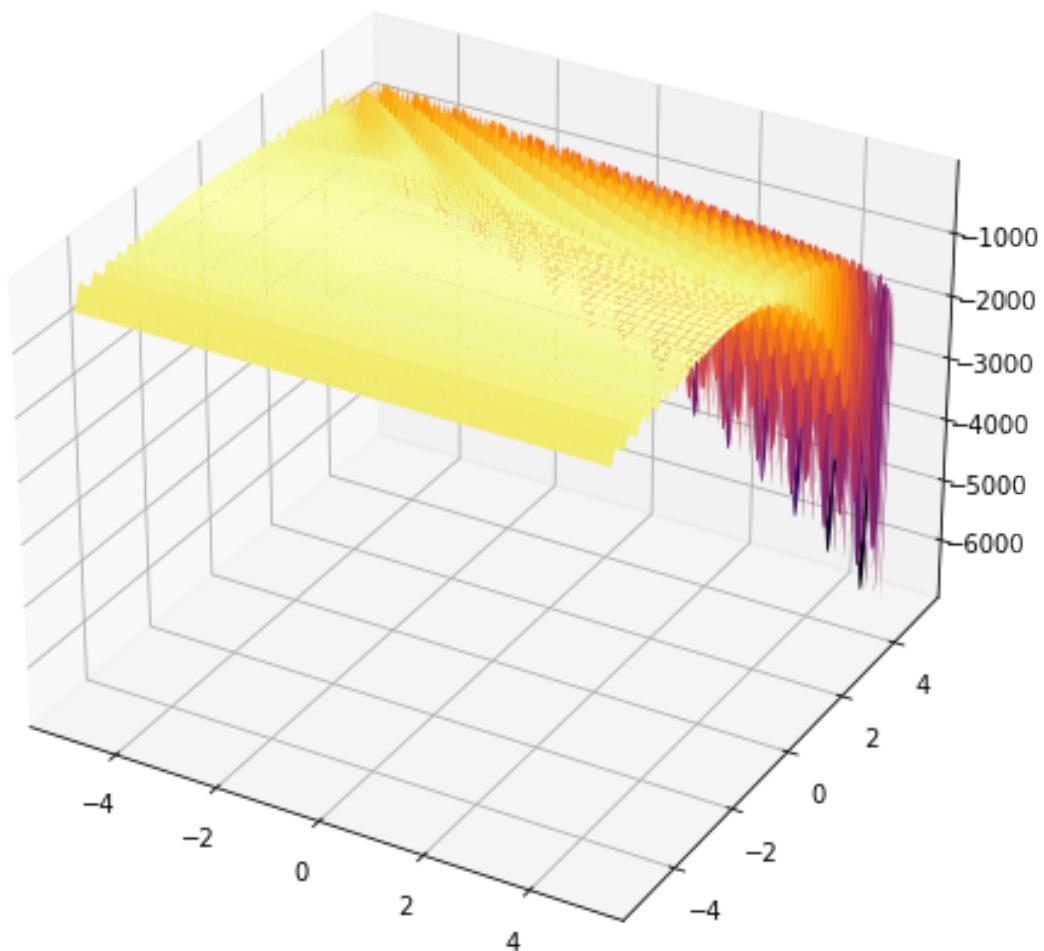
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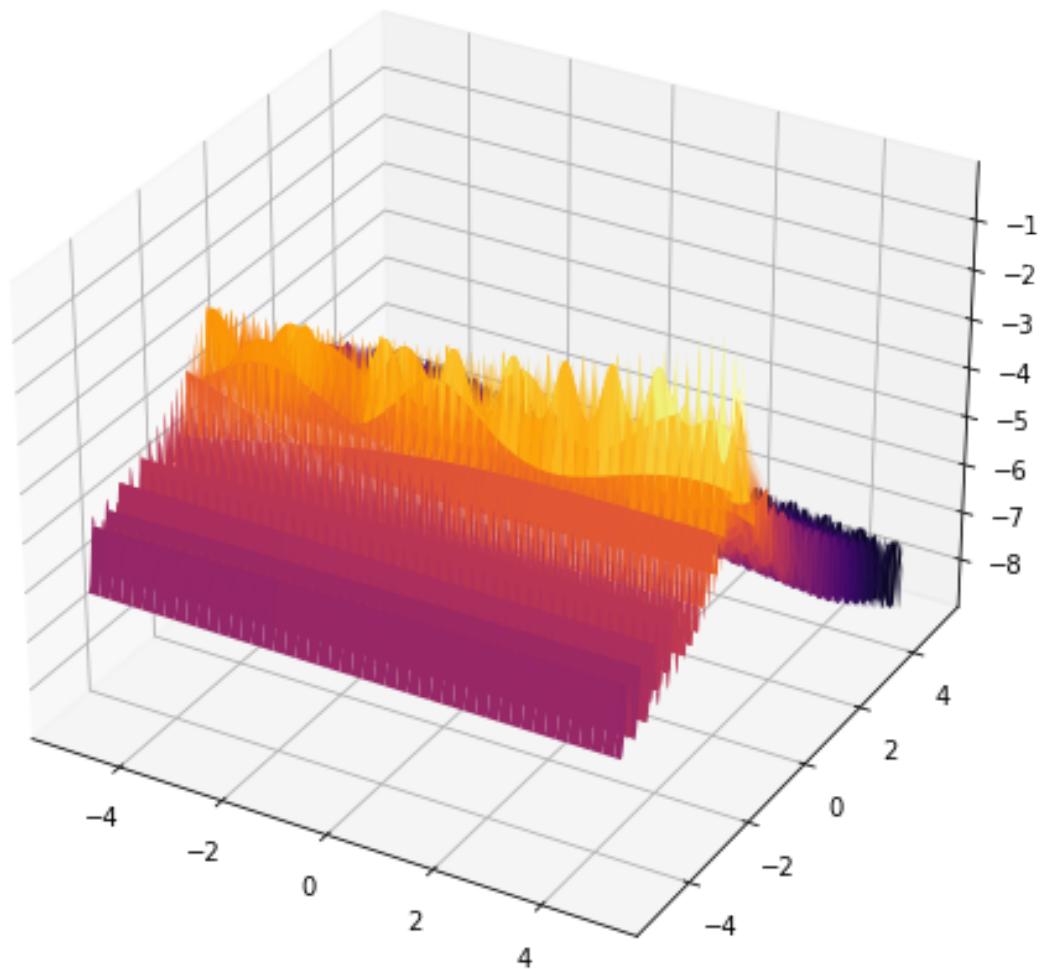
Log f18



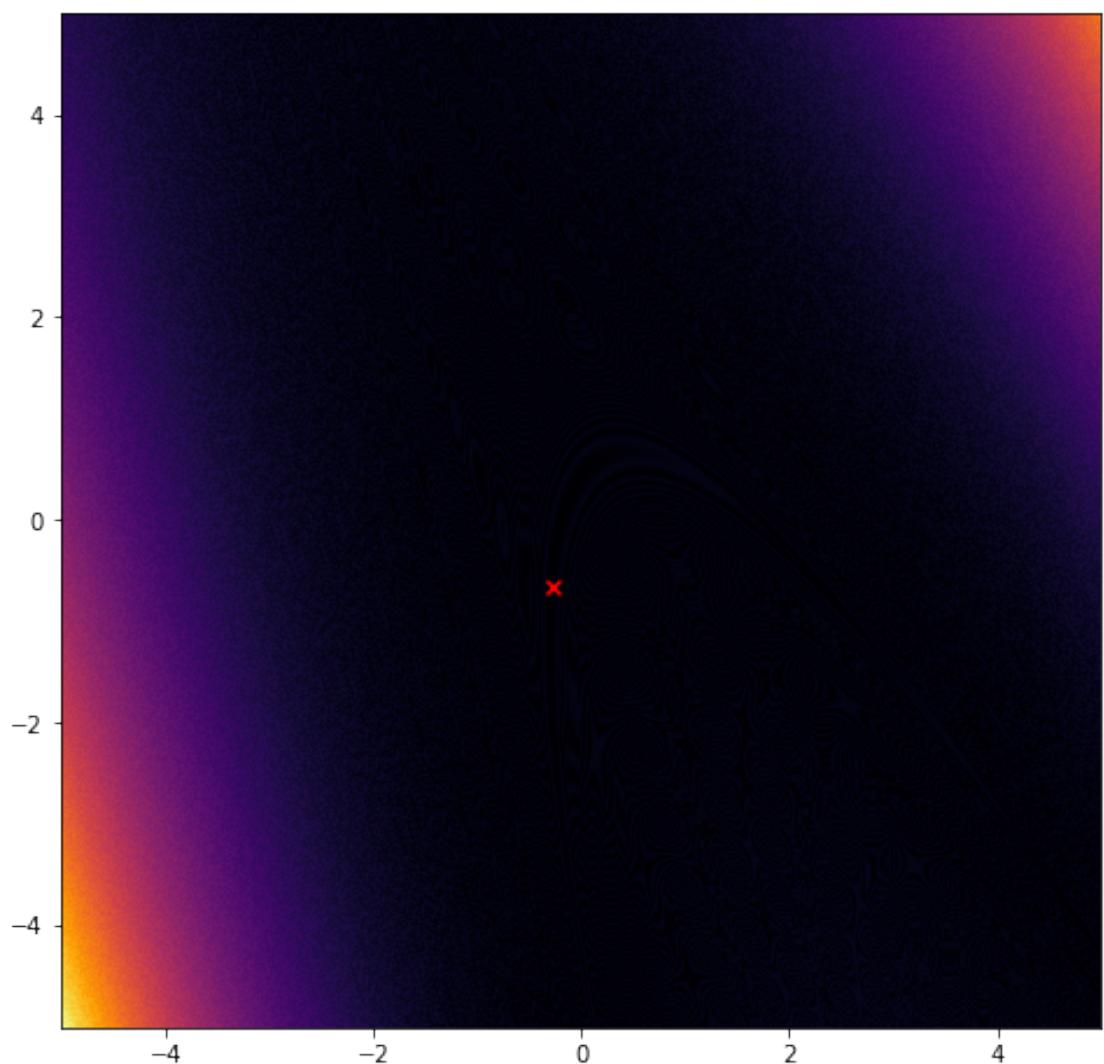
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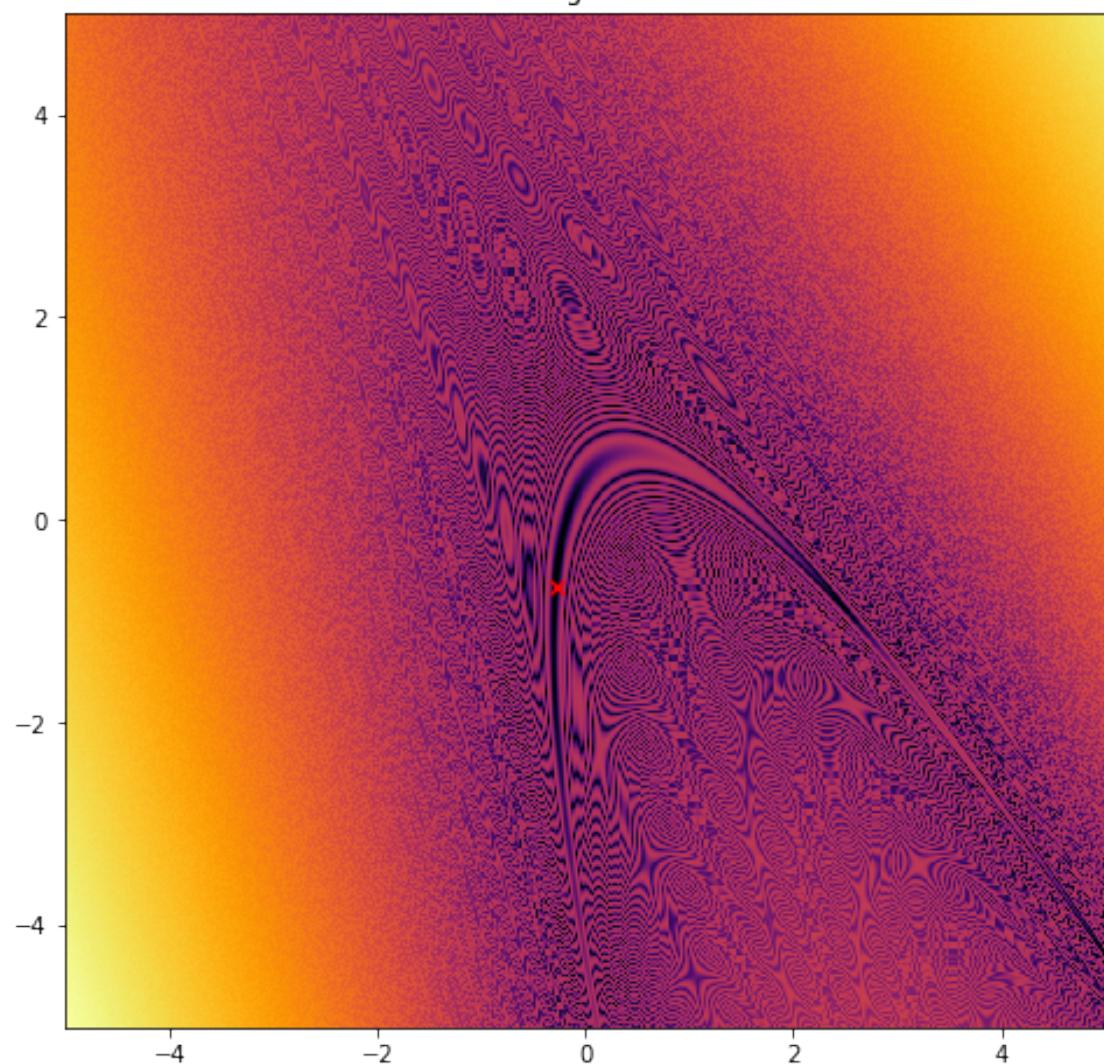
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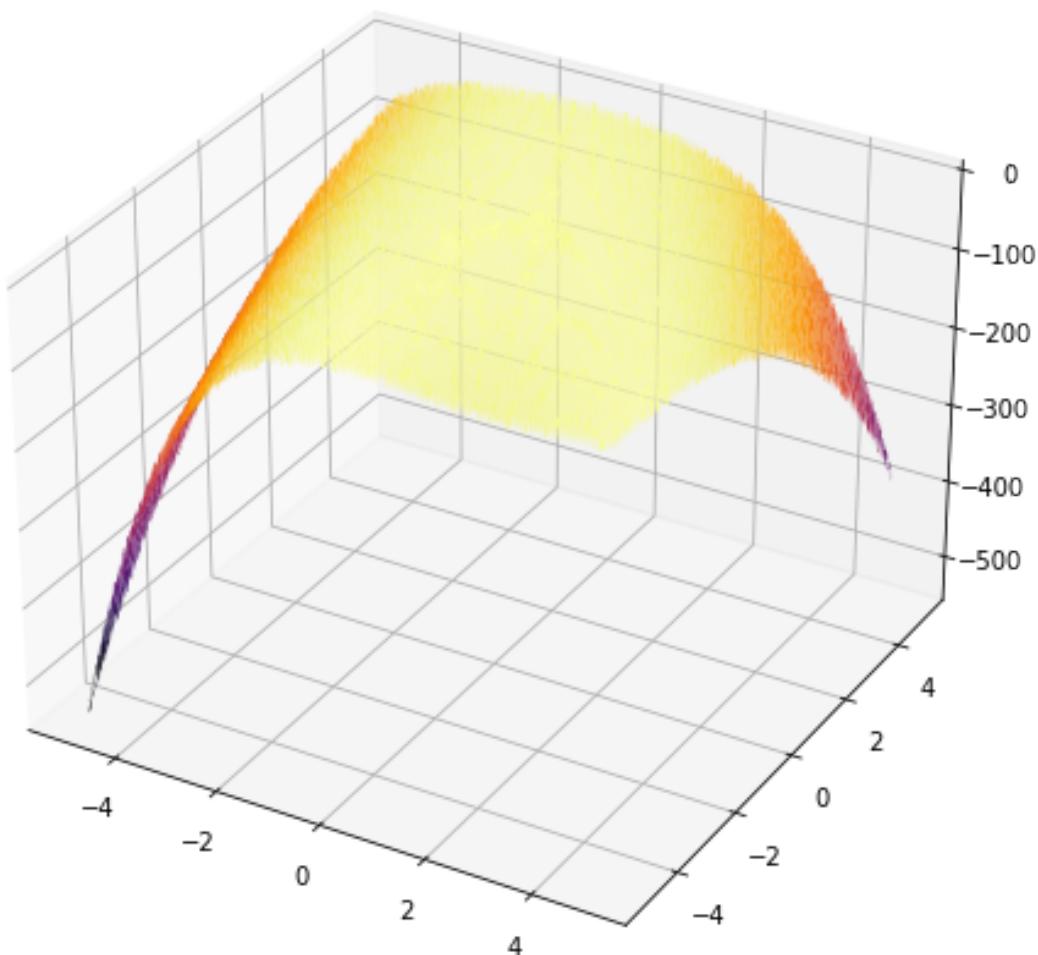
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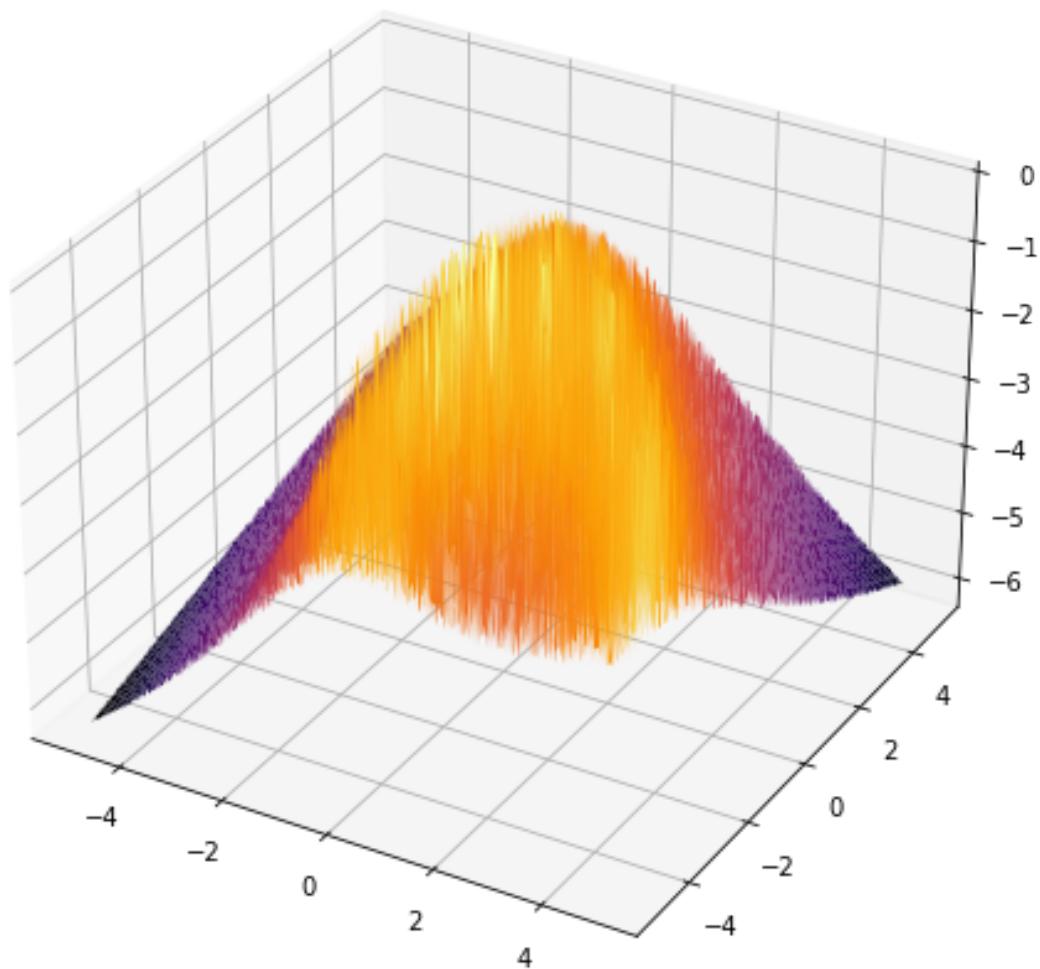
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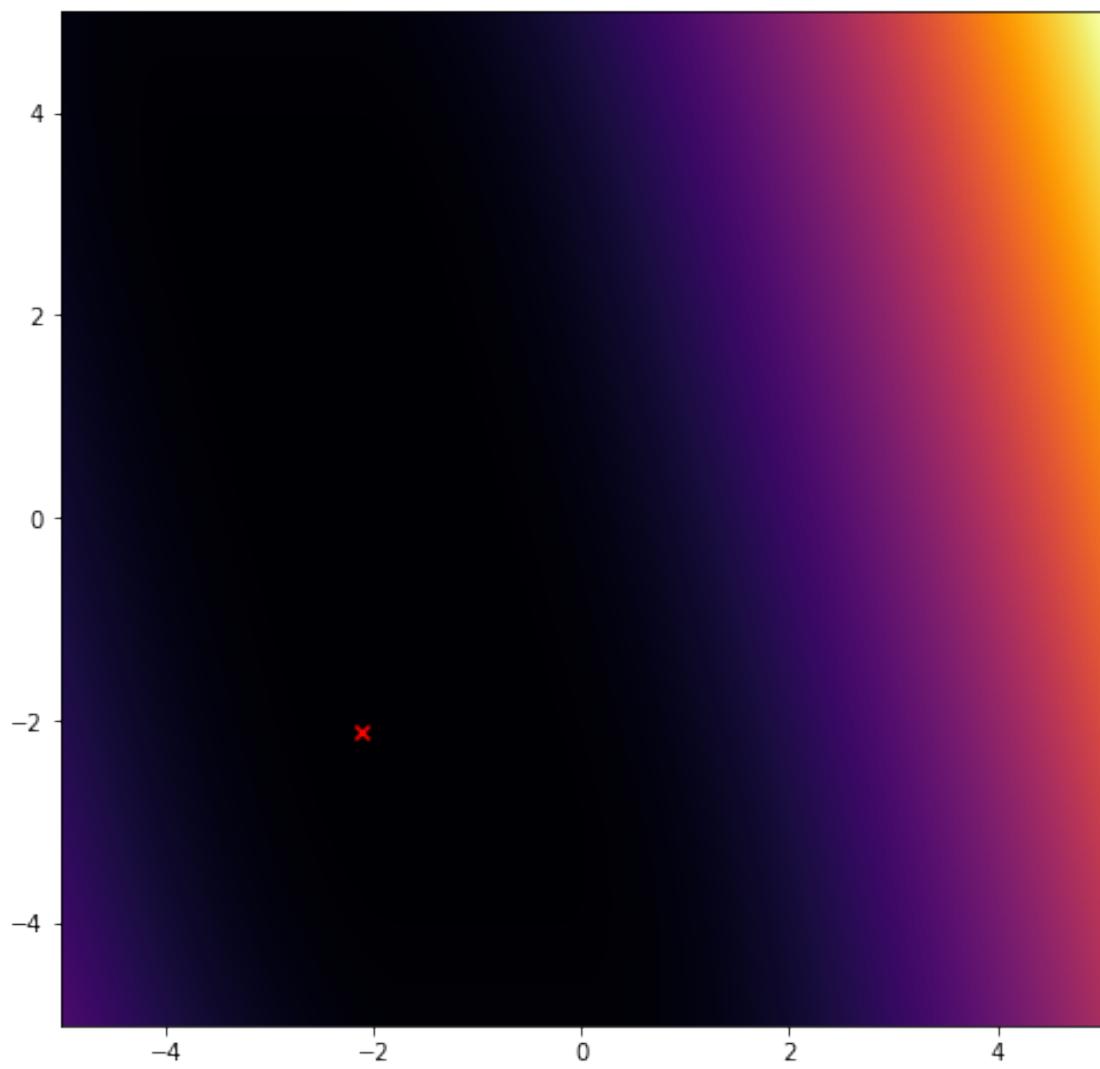
f19 3D



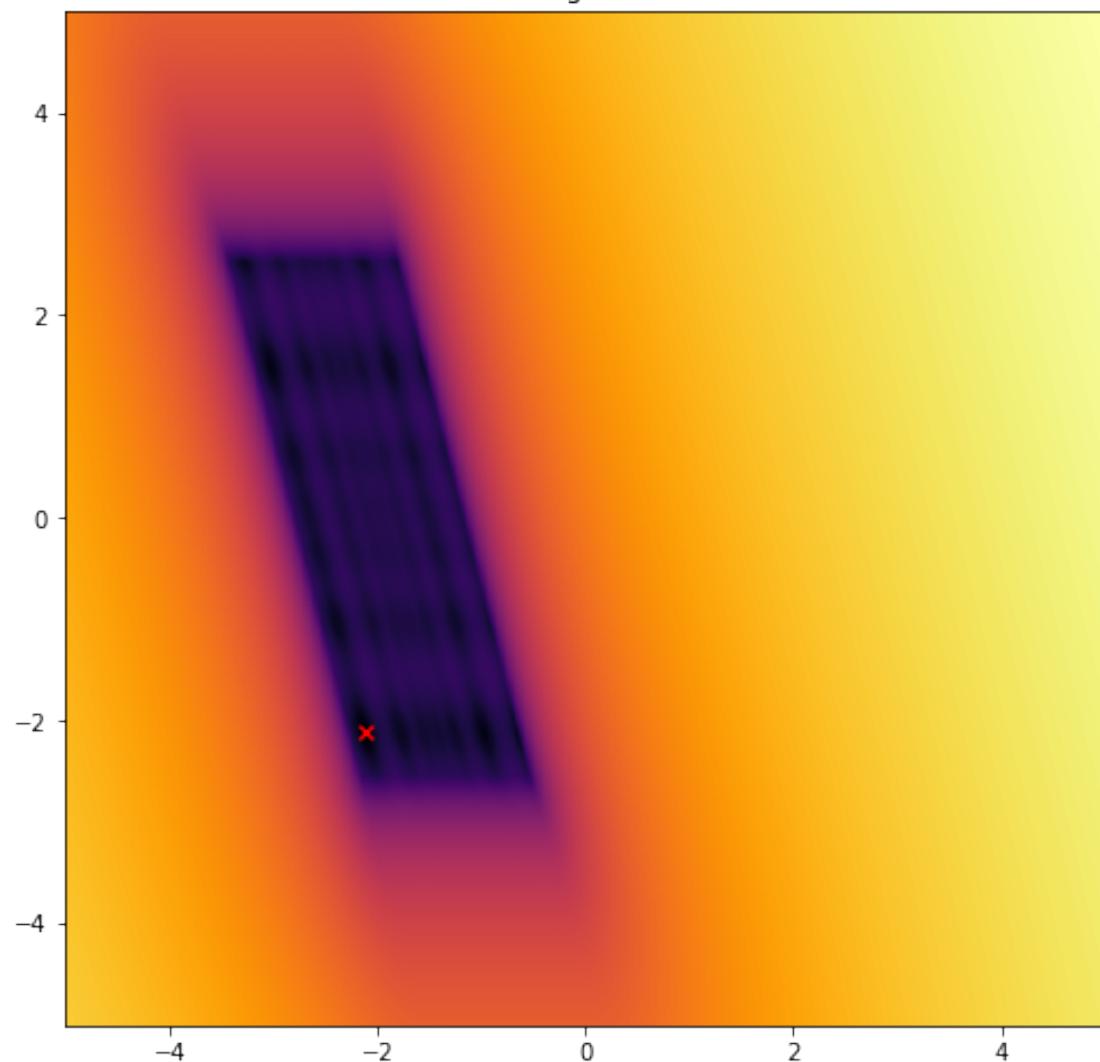
f19 log3D



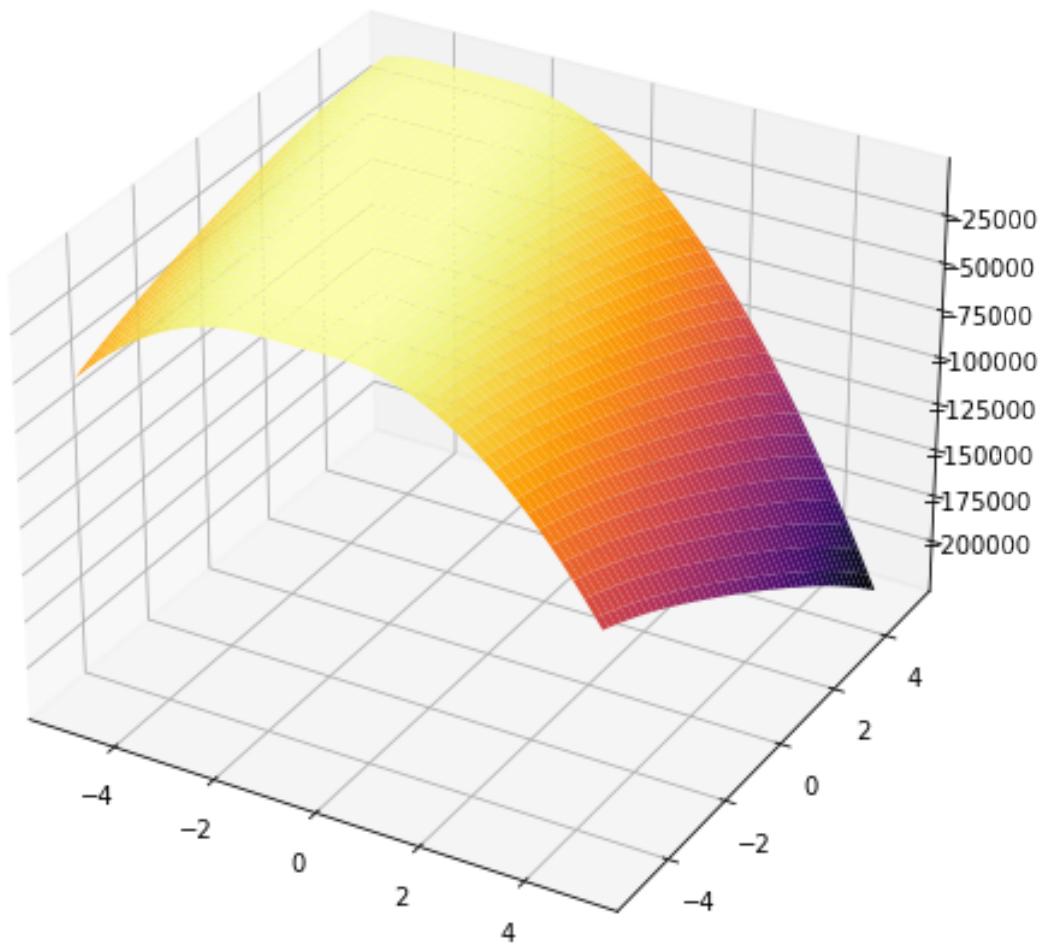
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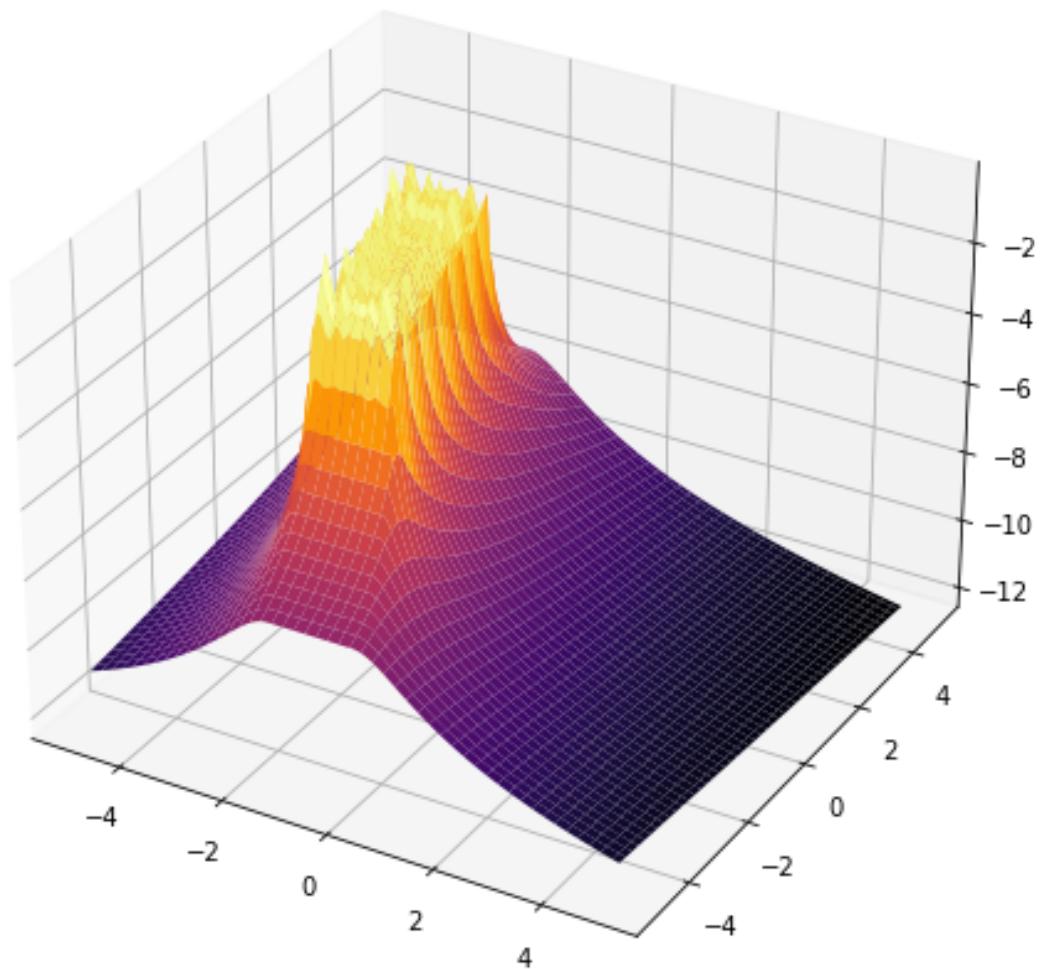
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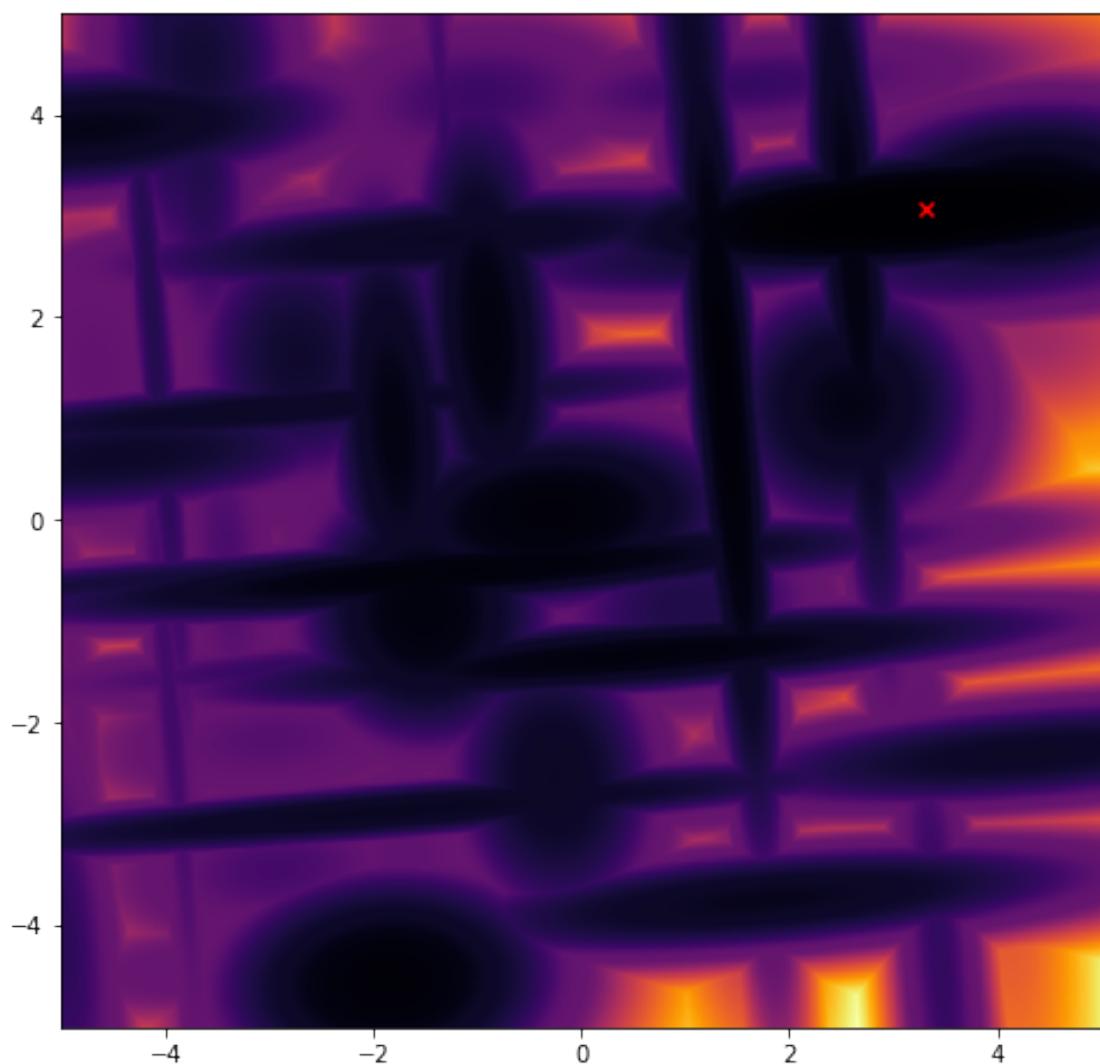
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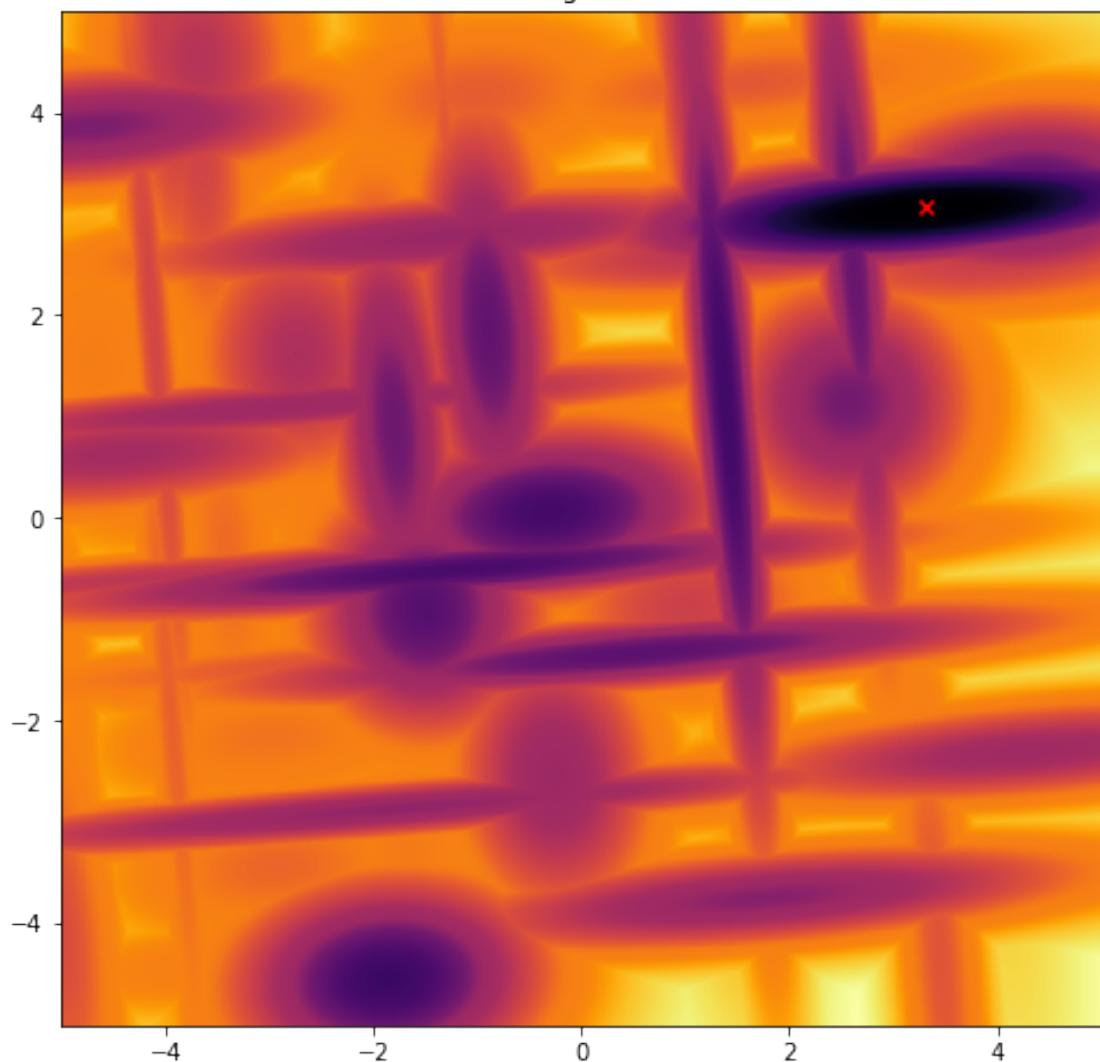
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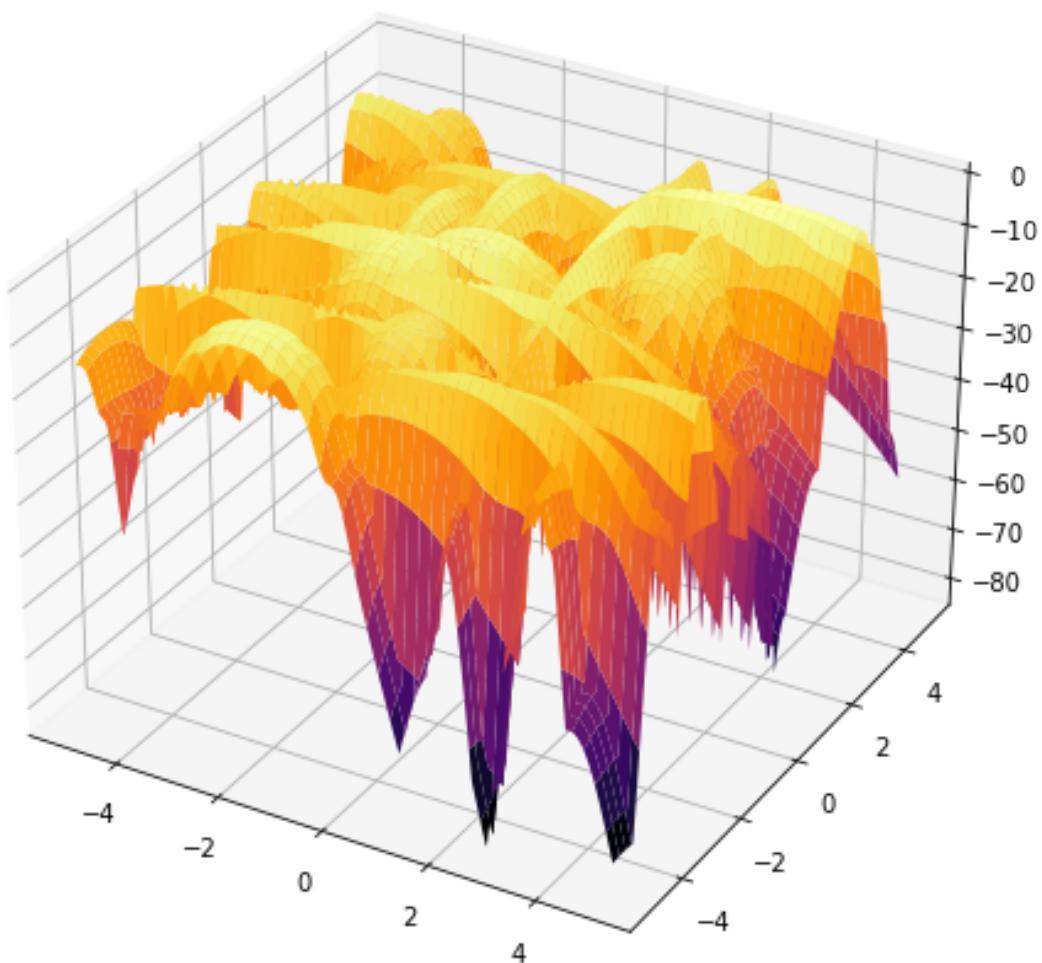
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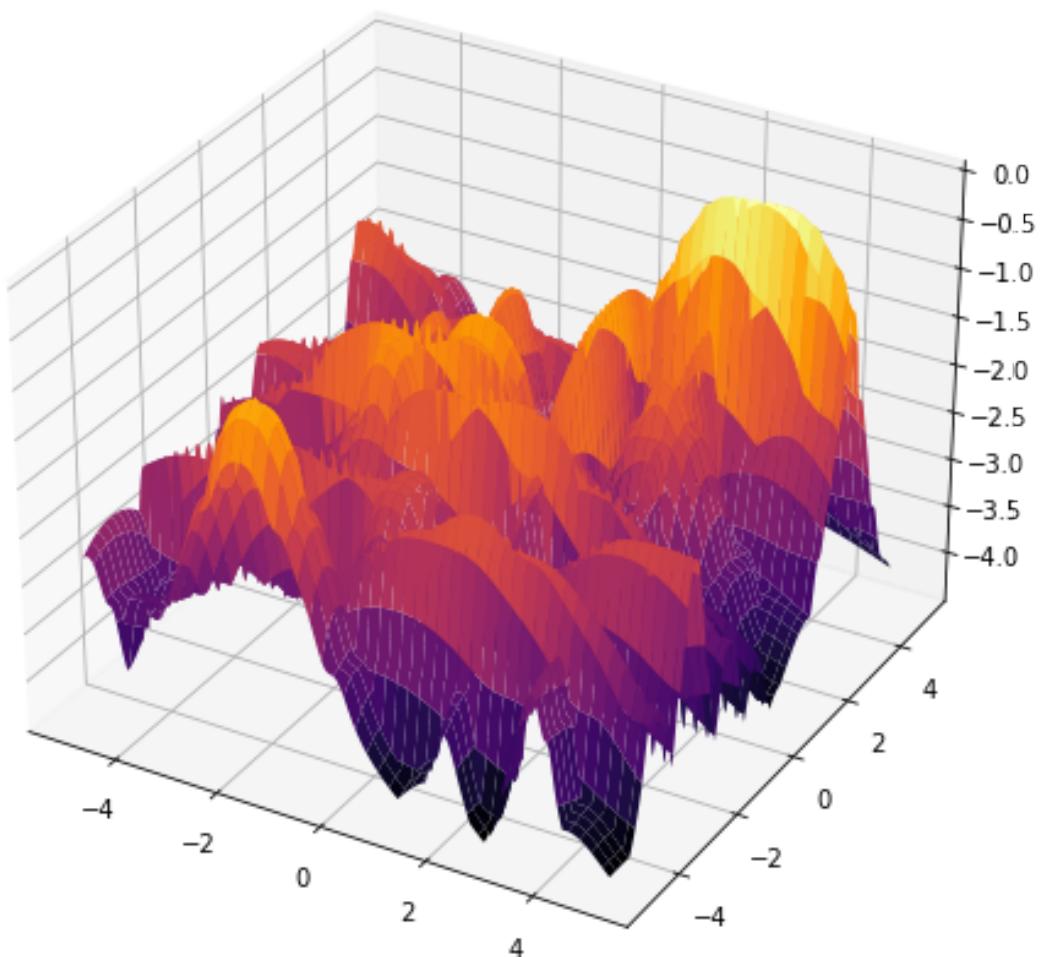
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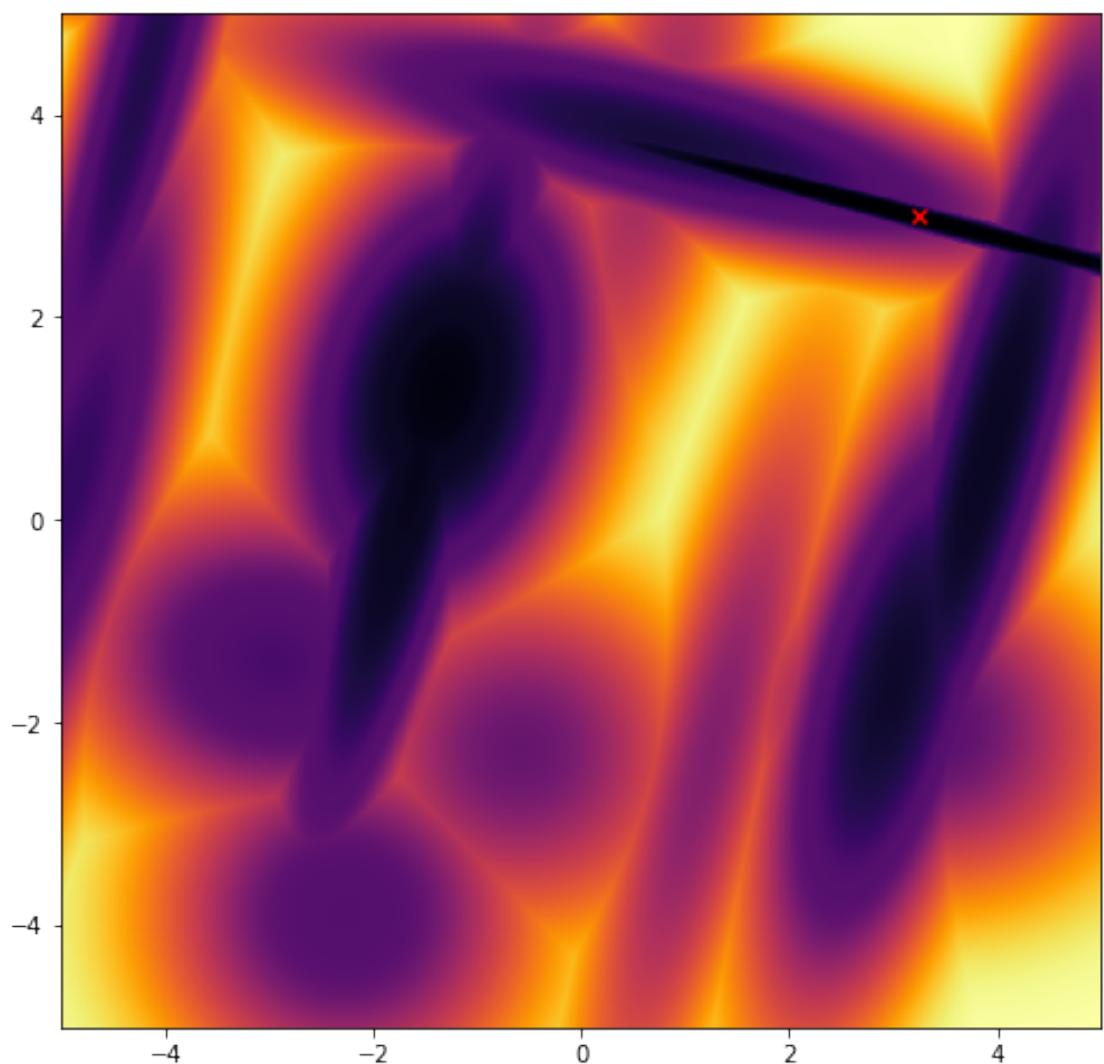
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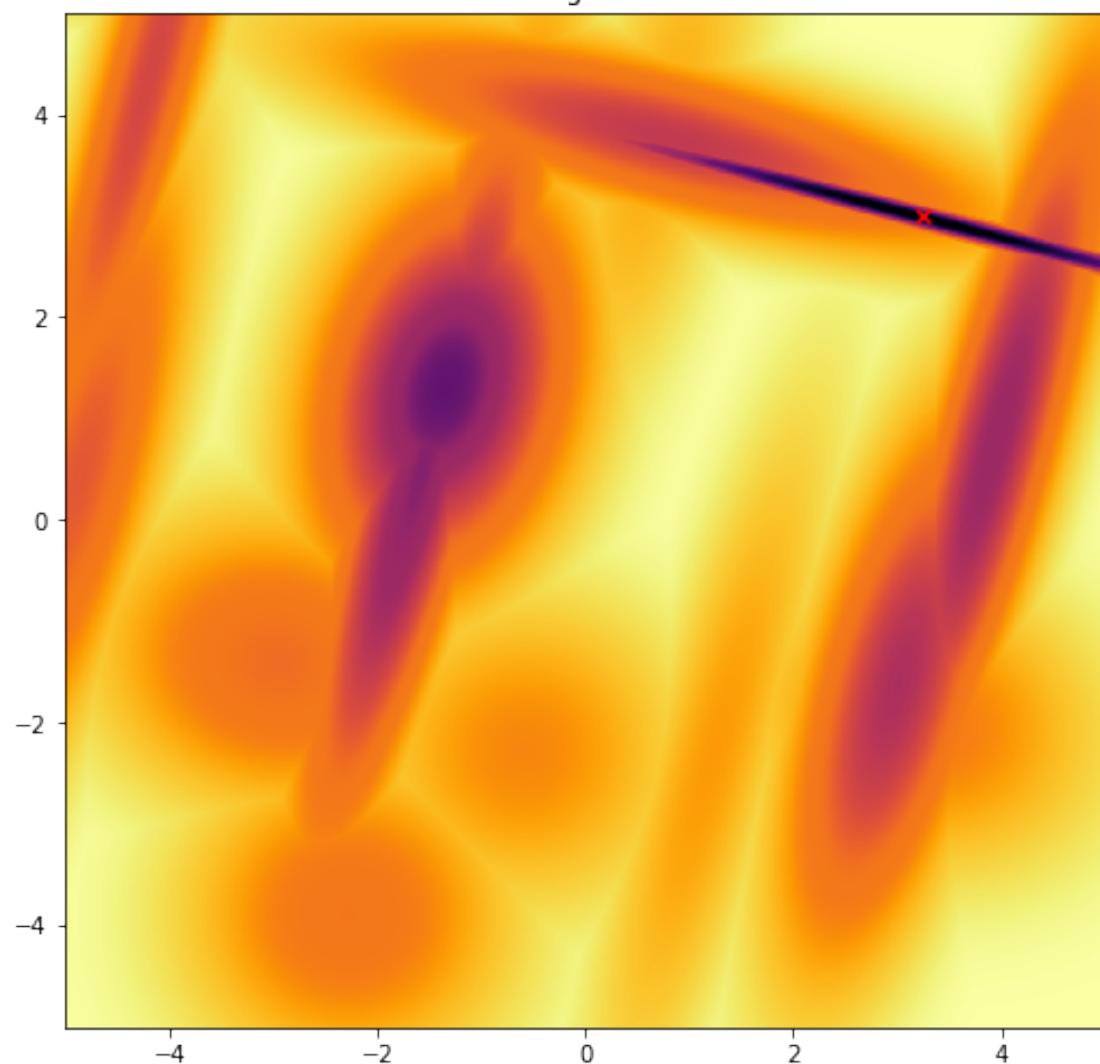
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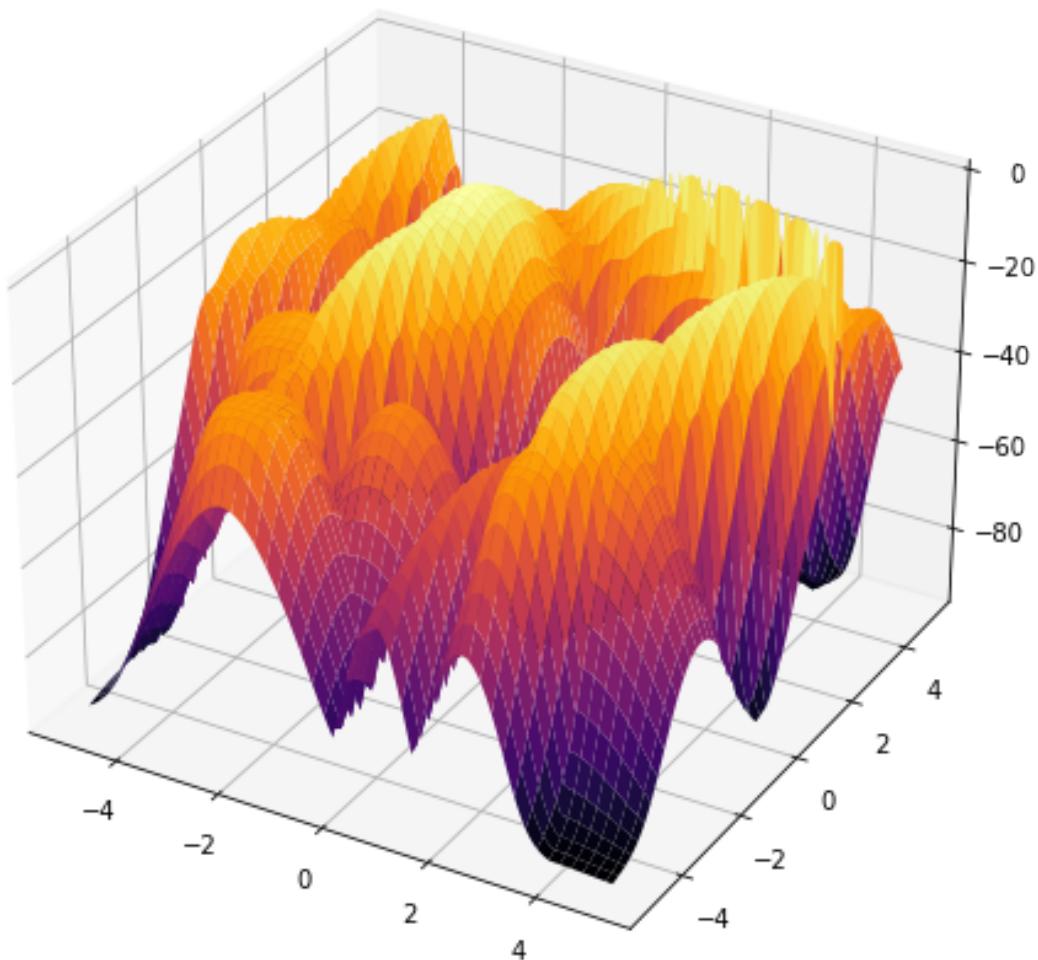
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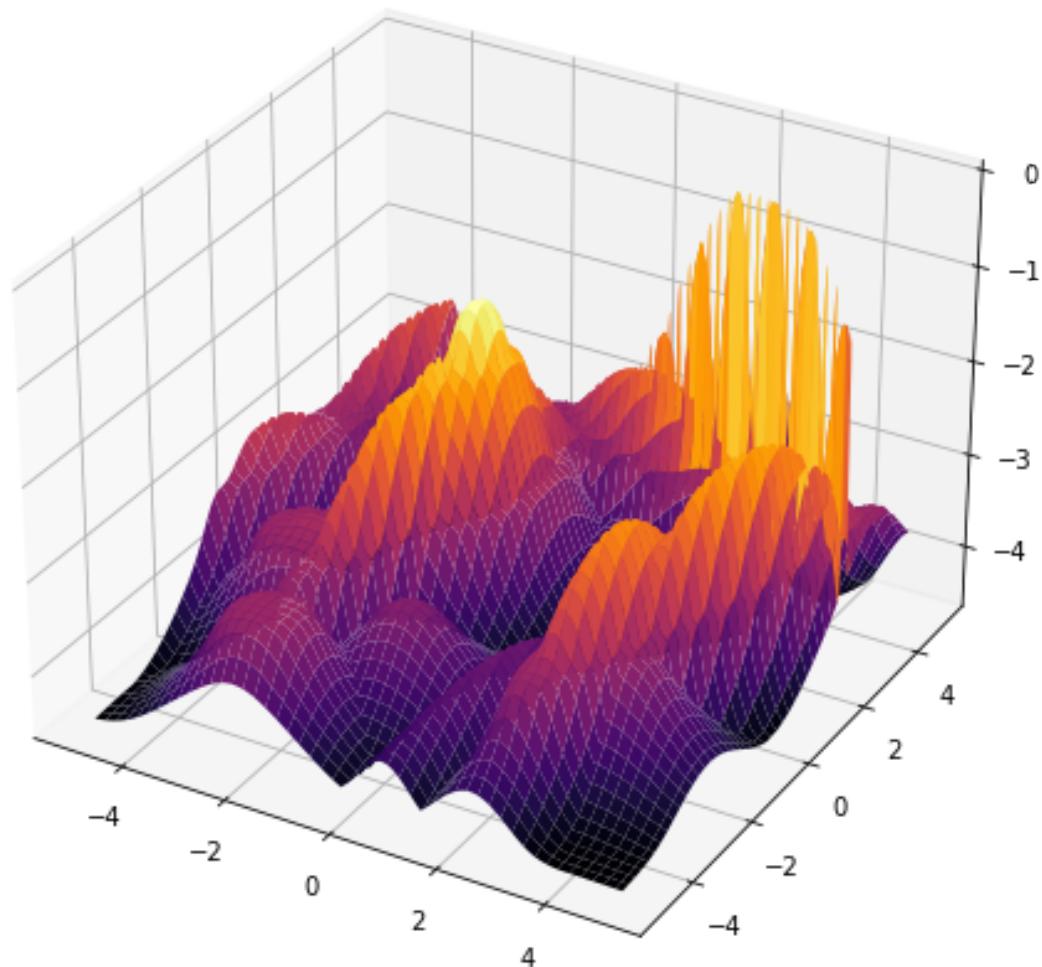
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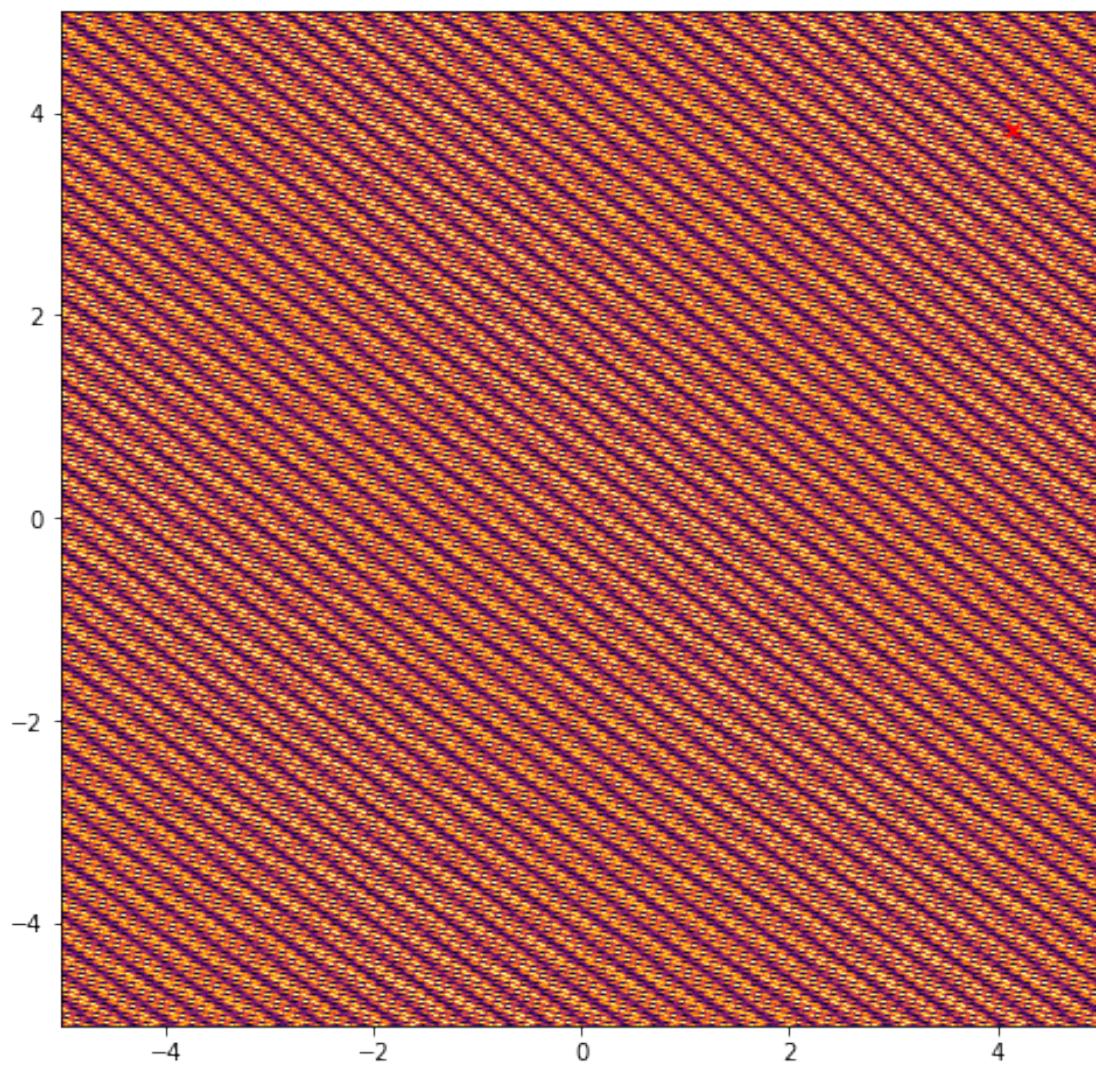
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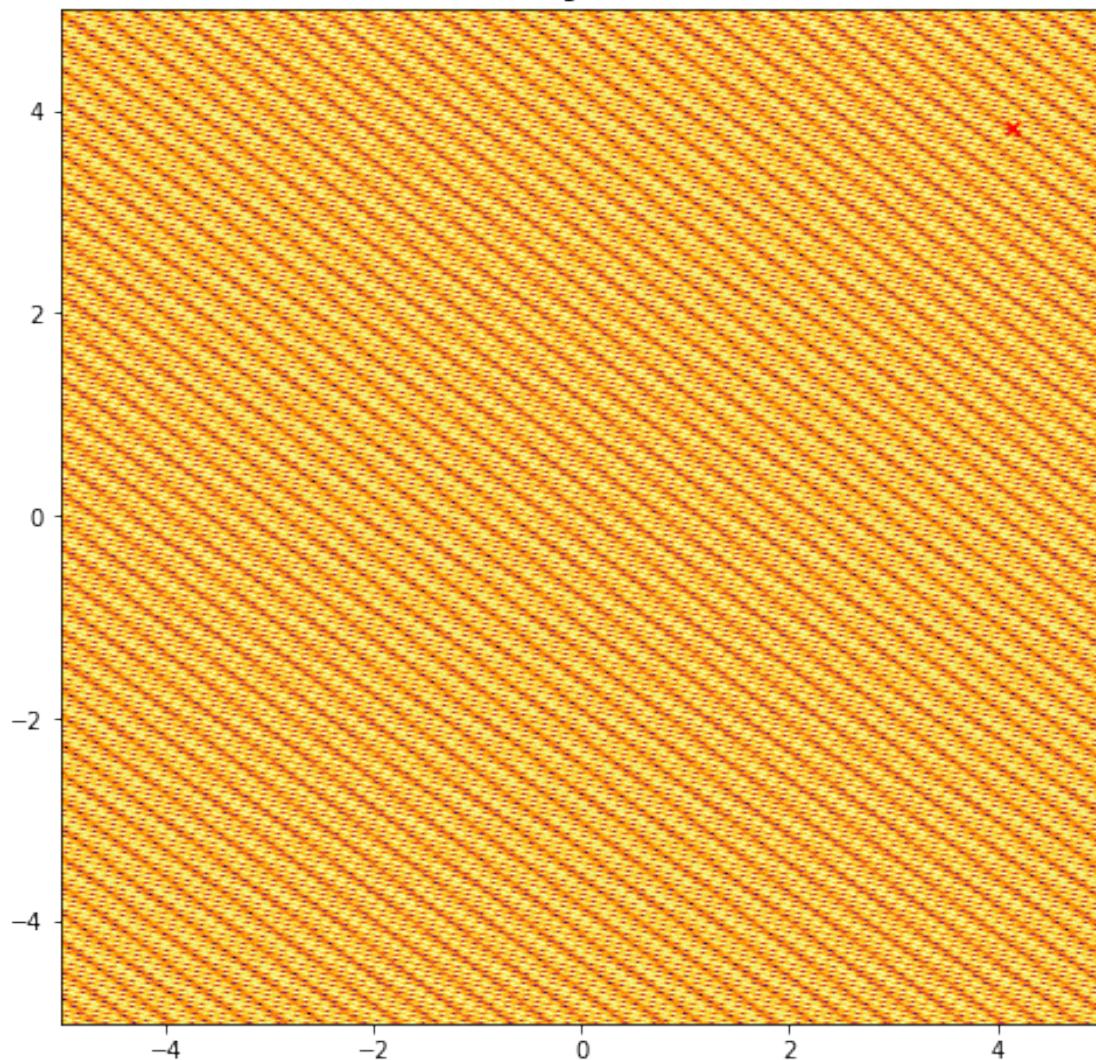
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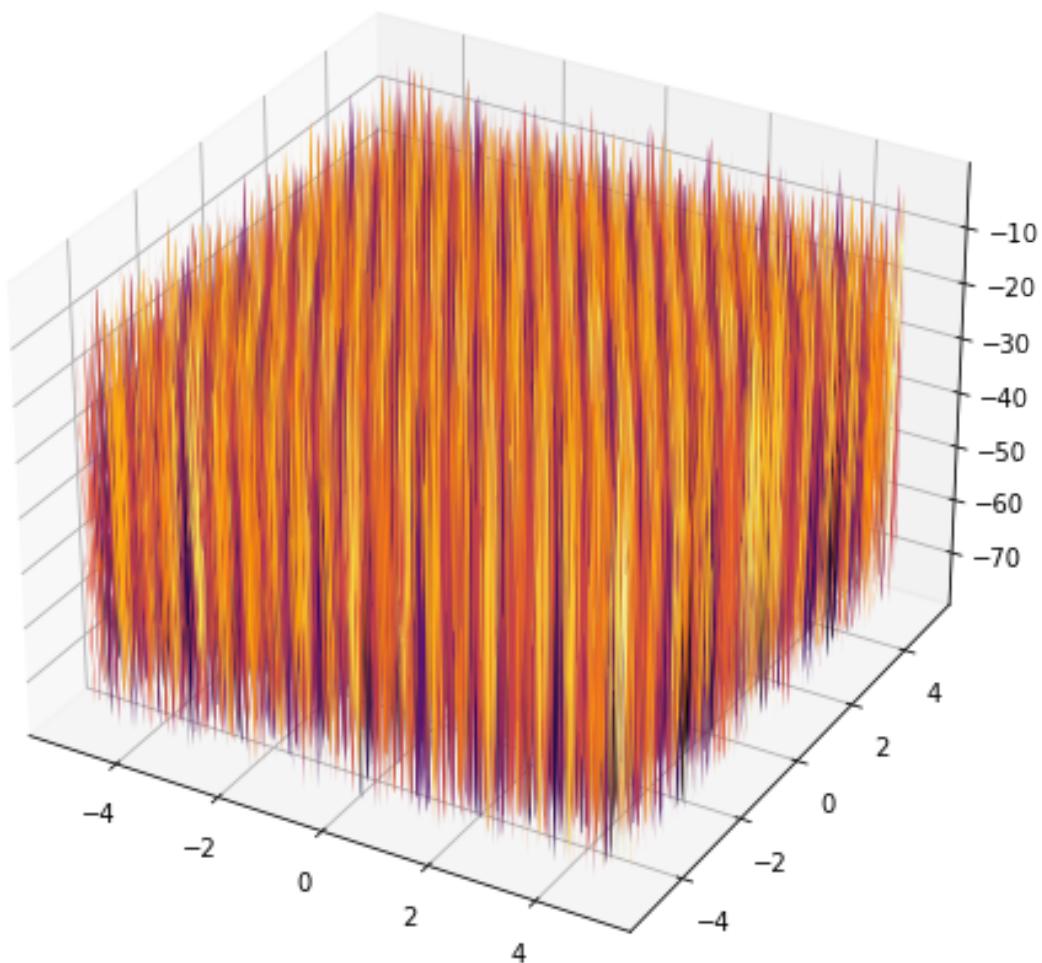
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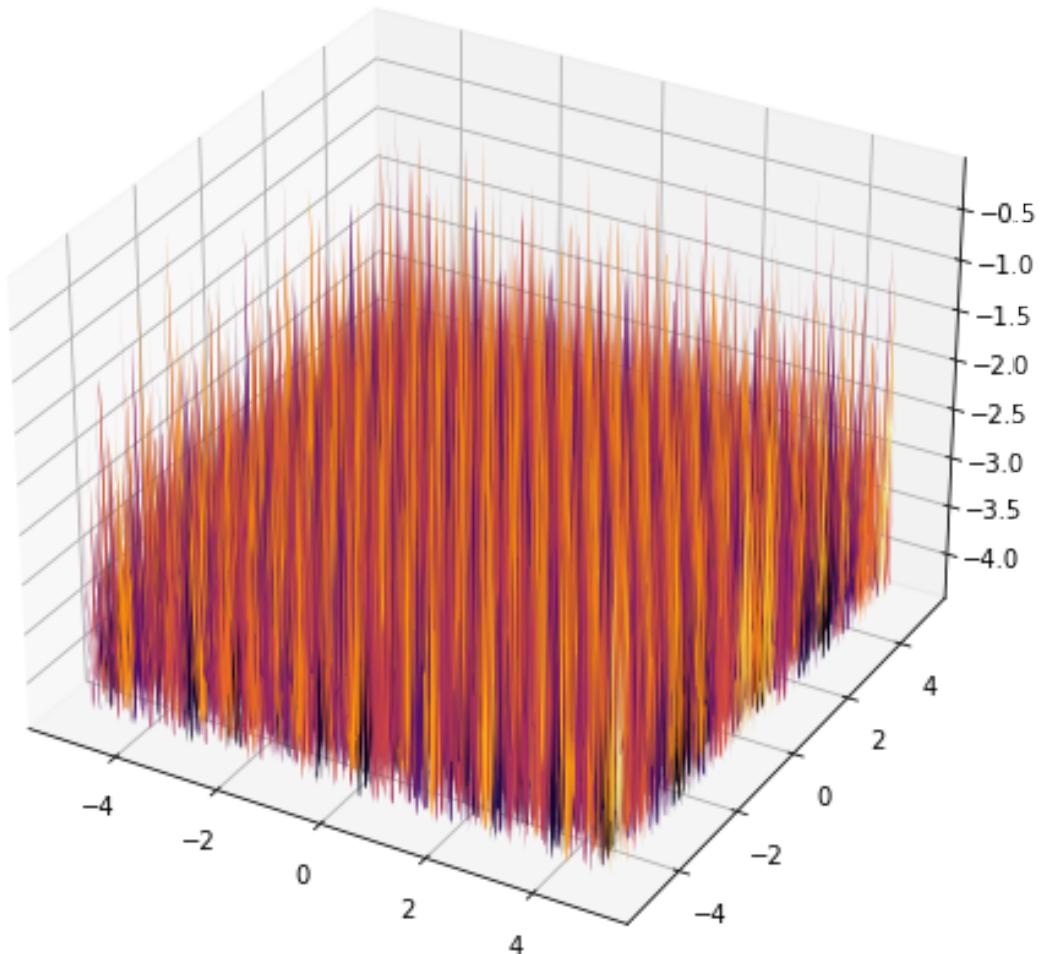
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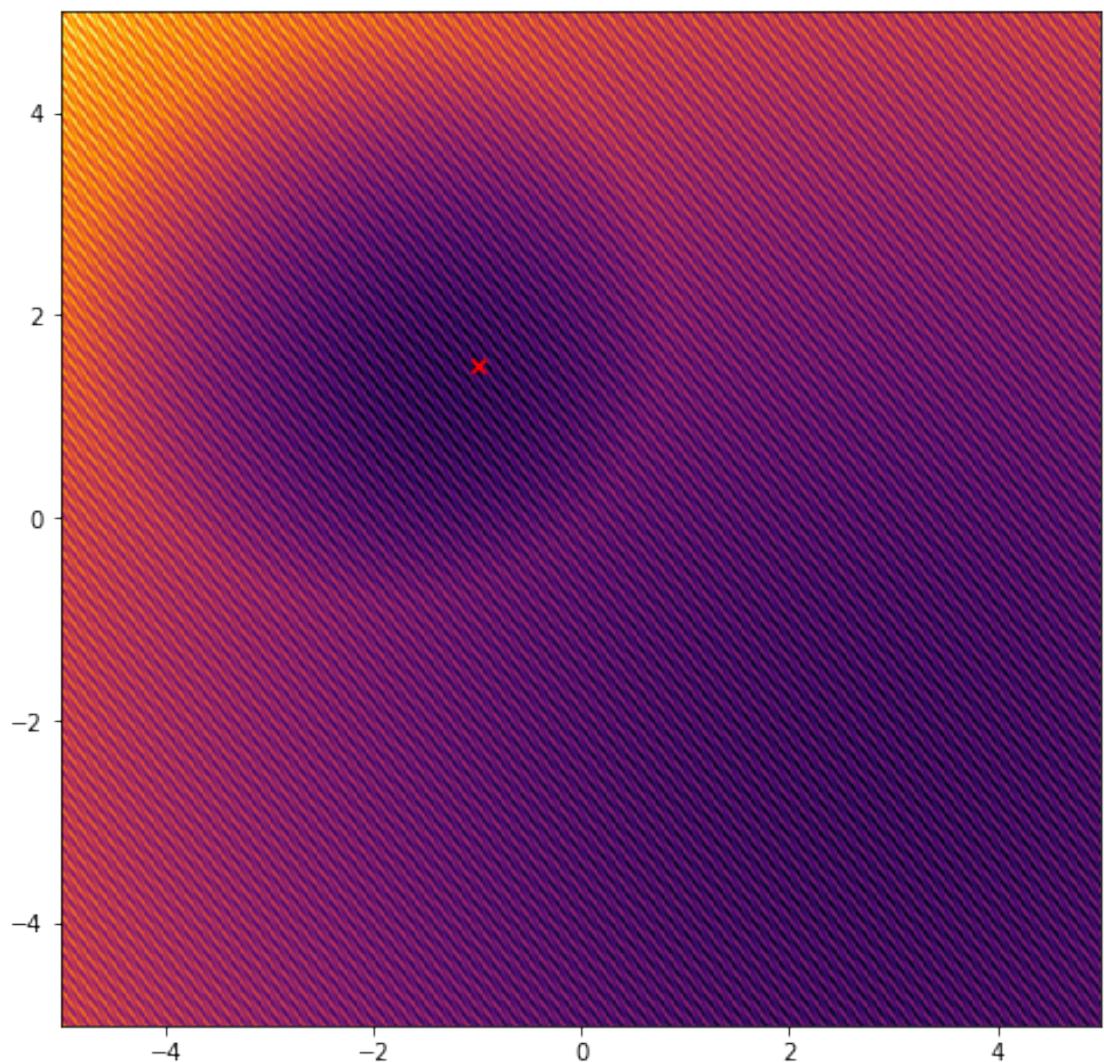
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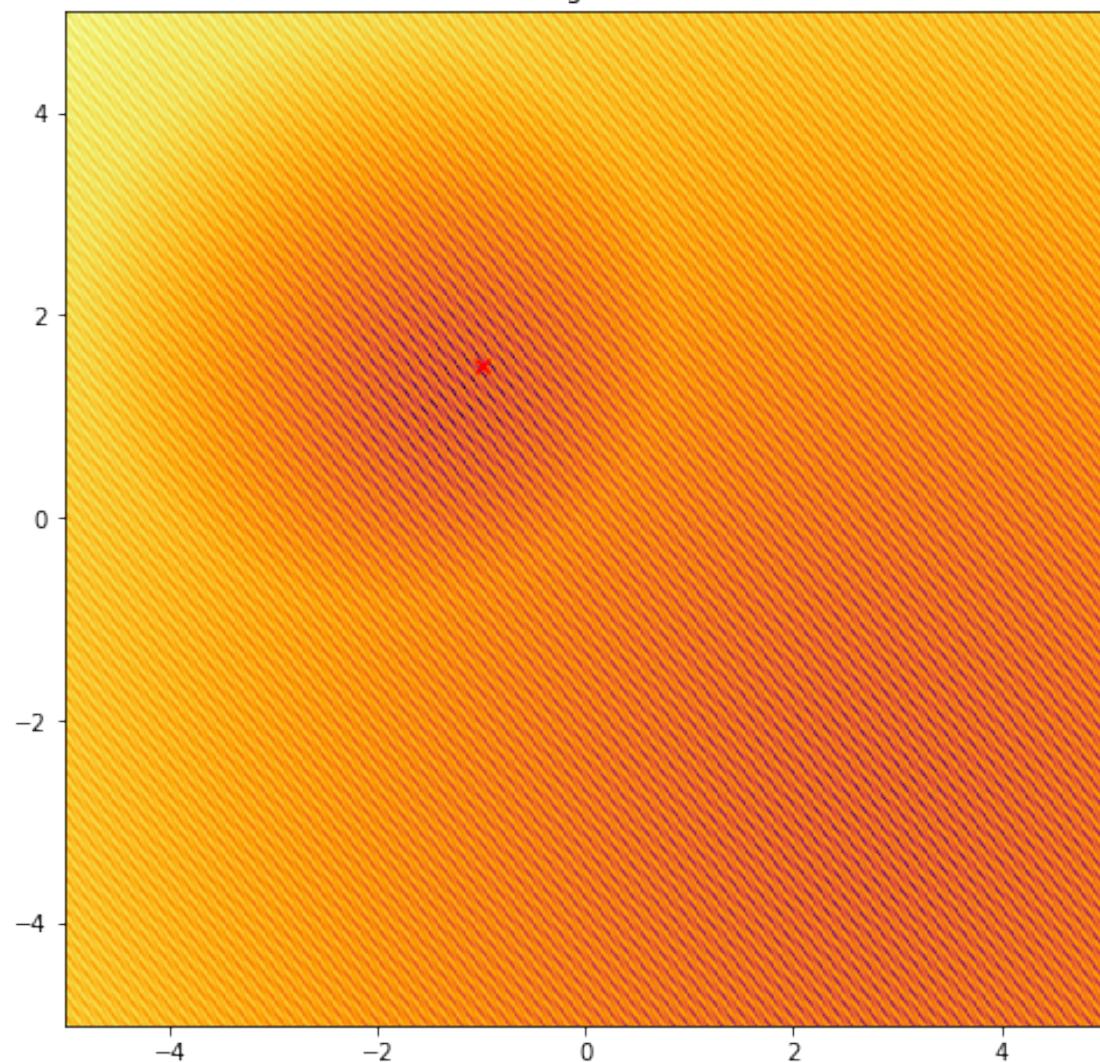
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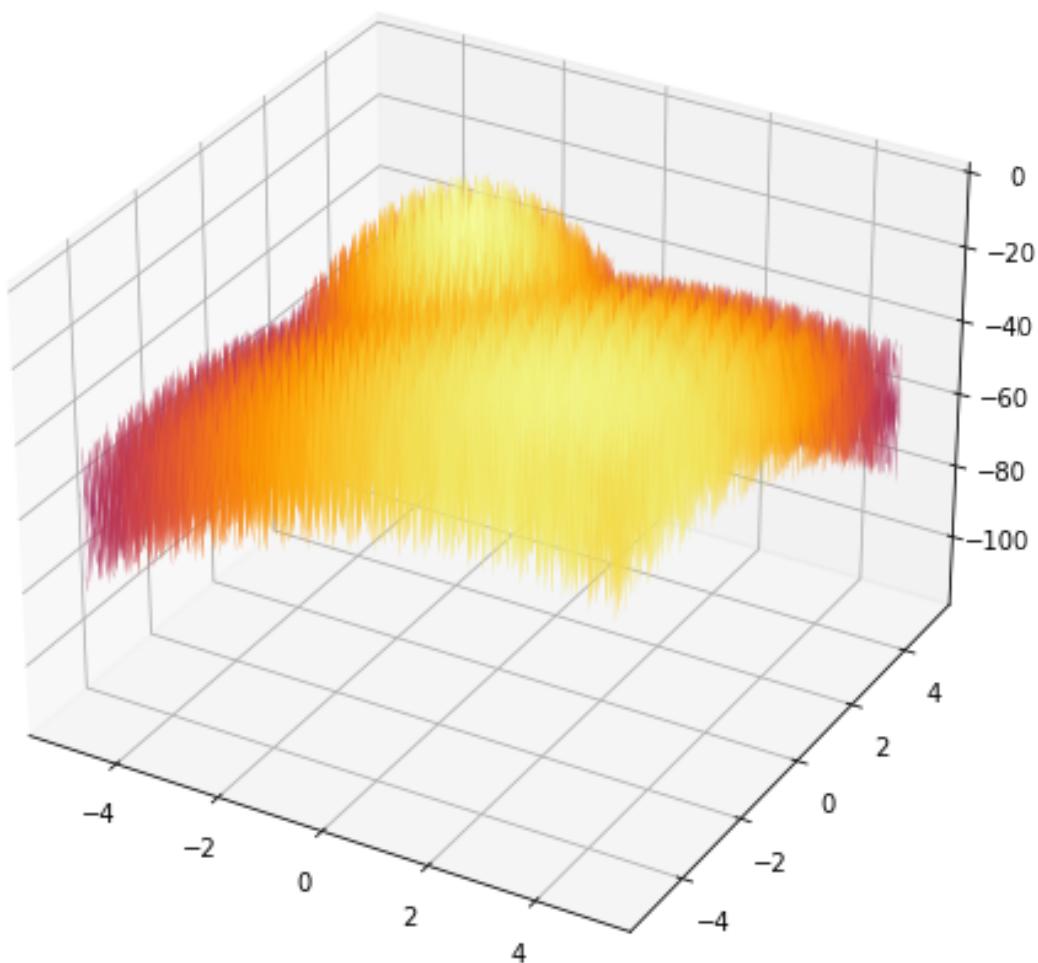
f24



Log f24



f24 3D



f24 log3D

