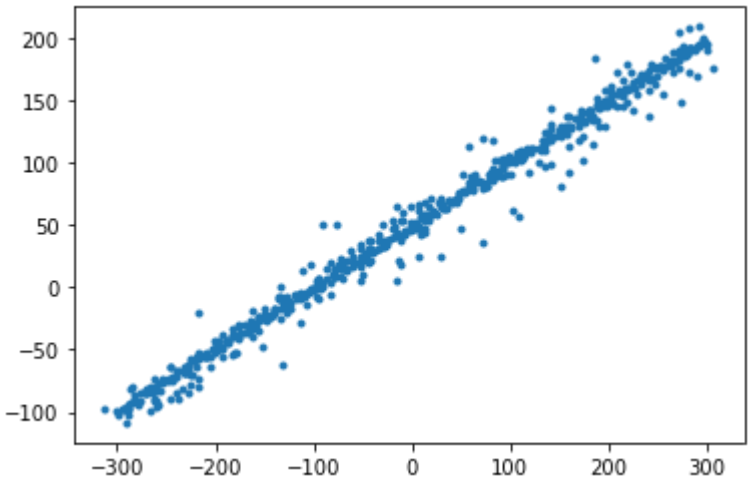
In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import skimage
%matplotlib inline
```

In [3]:
```
x = np.arange(-300, 300)
y = 0.5*x + 50

data = np.column_stack([x,y])

data_faulty = np.array(40* [(200.0, -130)])
data_faulty += 4* np.random.normal(size = data_faulty.shape)
data_faulty = data[:data_faulty.shape[0]]
```

In [4]:
```
data_noise = np.random.normal(size = data.shape)

data += 2* data_noise
data[::2] += 3* data_noise[::2]
data[::5] += 15* data_noise[::5]
```

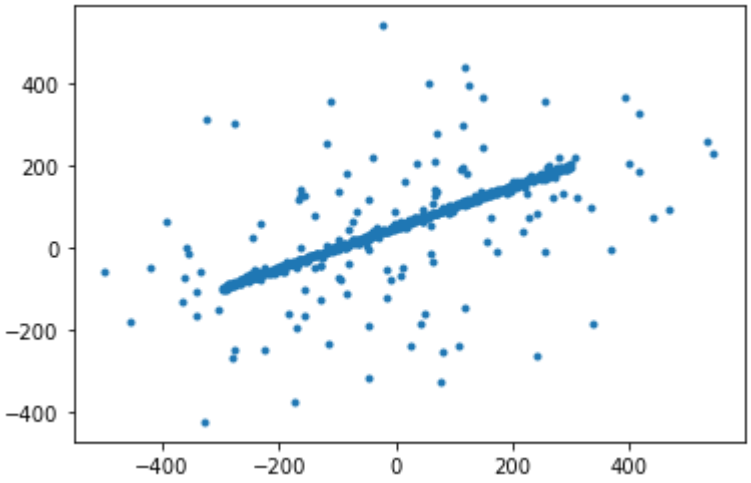
In [5]:
```
plt.plot(data[:,0], data [:,1], '.')
```

Out[5]: [<matplotlib.lines.Line2D at 0x259cd18cc70>]



In [6]:
```
x = np.arange(-300, 300)
y = 0.5*x + 50

data = np.column_stack([x,y])

data_faulty = np.array(40* [(200.0, -130)])
data_faulty += 4* np.random.normal(size = data_faulty.shape)
data_faulty = data[:data_faulty.shape[0]]

data_noise = np.random.normal(size = data.shape)

data += 2* data_noise
data[::2] += 3* data_noise[::2]
data[::5] += 150* data_noise[::5]
plt.plot(data[:,0], data [:,1], '.')
```

Out[6]:
```
[<matplotlib.lines.Line2D at 0x259cd1929a0>]
```



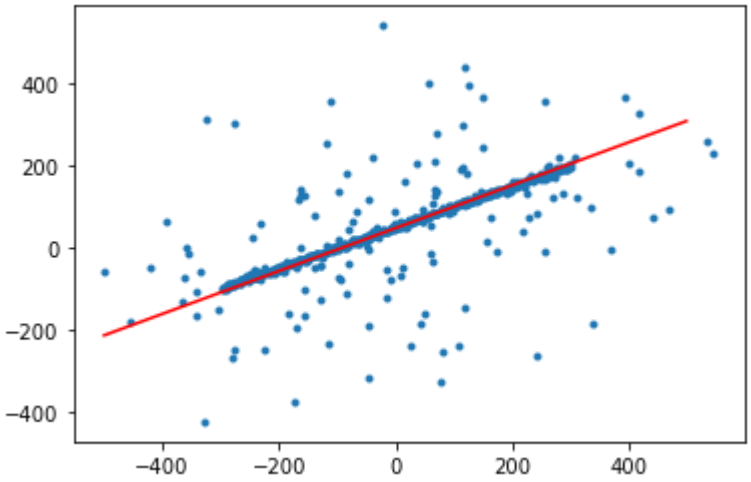
In [12]:
```
from skimage.measure import LineModelND, ransac
```

In [13]:
```
nd_model = LineModelND()
nd_model.estimate(data)
nd_model.params
```

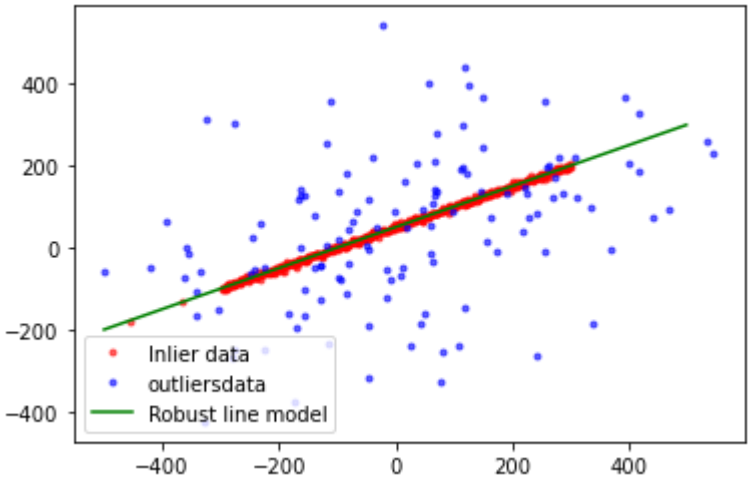
Out[13]:
```
(array([ 0.48329443, 47.65147566]), array([0.88628854, 0.46313348]))
```

In [14]:
```
# draw line
x1 = np.arange(-500,500)
orig, direc = nd_model.params
plt.plot(data[:,0], data[:,1], '.')
plt.plot(x1, nd_model.predict_y(x1),  'r-')
```

Out[14]: [<matplotlib.lines.Line2D at 0x259cfe80f10>]

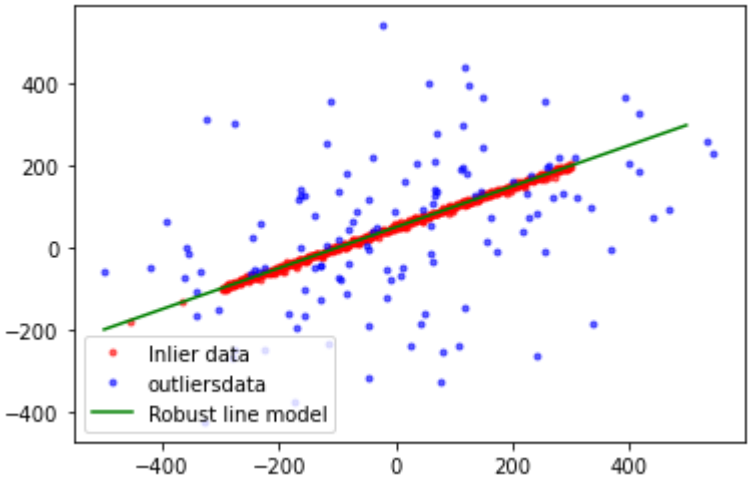


In [17]:
```
model_robust, inliers = ransac(data, LineModelND, min_samples =2,
                               residual_threshold = 10, max_trials = 1000)
outliers = (inliers ==False)

yy = model_robust.predict_y(x1)

fig, ax = plt.subplots()

ax.plot(data[inliers, 0], data[inliers, 1], '.r', alpha = 0.6, label = 'Inlie
ax.plot(data[outliers, 0], data[outliers, 1], '.b', alpha =0.6, label = 'outl
ax.plot(x1, yy, '-g', label = 'Robust line model')
plt.legend(loc = 'lower left')
plt.show()
```



In [24]:

```
model_robust, inliers = ransac(data, LineModelND, min_samples =2,
                               residual_threshold = 10, max_trials = 2000)
outliers = (inliers ==False)

yy = model_robust.predict_y(x1)

fig, ax = plt.subplots()

ax.plot(data[inliers, 0], data[inliers, 1], '.r', alpha = 0.6, label = 'Inlie
ax.plot(data[outliers, 0], data[outliers, 1], '.b', alpha =0.6, label = 'outl
ax.plot(x1, yy, '-g', label = 'Robust line model')
plt.legend(loc = 'lower left')
plt.show()
```



In [ ]: