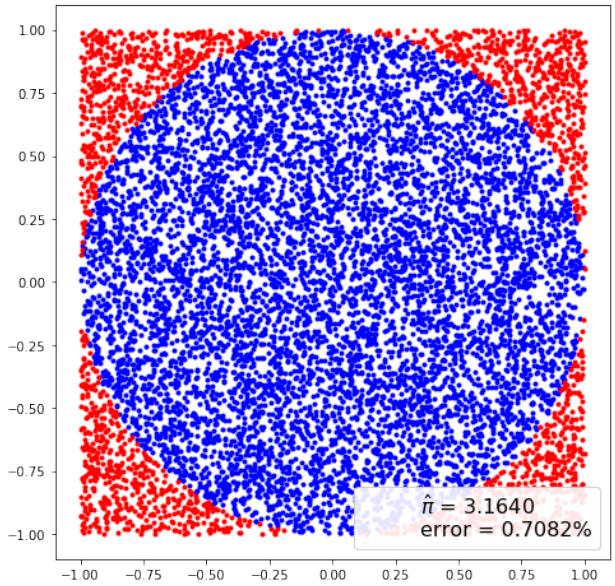
Aproximación de Pi

1 Aproximación de Pi

In [3]:
```
import numpy as np
import random
import matplotlib.pyplot as plt

def mc_pi_aprox(N=10000):
    plt.figure(figsize=(8,8))  # tamaño de la figura
    x, y = np.random.uniform(-1, 1, size=(2, N))
    interior = (x**2 + y**2) <= 1
    pi = interior.sum() * 4 / N
    error = abs((pi - np.pi) / pi) * 100
    exterior = np.invert(interior)
    plt.plot(x[interior], y[interior], 'b.')
    plt.plot(x[exterior], y[exterior], 'r.')
    plt.plot(0, 0, label='$\hat \pi$ = {:4.4f}\nerror = {:4.4f}%'
             .format(pi,error), alpha=0)
    plt.axis('square')
    plt.legend(frameon=True, framealpha=0.9, fontsize=16)

mc_pi_aprox()
```



In [4]:
```
import numpy as np
import random
import matplotlib.pyplot as plt

def mc_pi_aprox(N=10000):
    plt.figure(figsize=(8,8))  # tamaño de la figura
    x, y = np.random.uniform(-1, 1, size=(2, N))
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             .format(pi,error), alpha=0)
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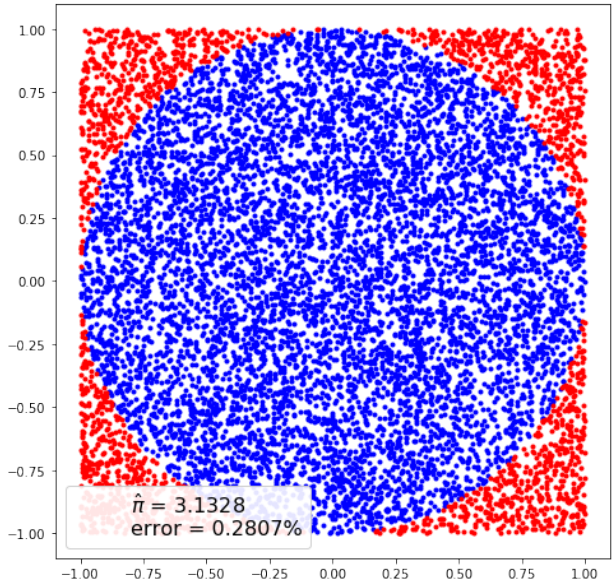
mc_pi_aprox()
```



In [5]:
```
import numpy as np
import random
import matplotlib.pyplot as plt

def mc_pi_aprox(N=10000):
```

```
    plt.figure(figsize=(8,8))  # tamaño de la figura
    x, y = np.random.uniform(-1, 1, size=(2, N))
    interior = (x**2 + y**2) <= 1
    pi = interior.sum() * 4 / N
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    exterior = np.invert(interior)
    plt.plot(x[interior], y[interior], 'b.')
    plt.plot(x[exterior], y[exterior], 'r.')
    plt.plot(0, 0, label='$\hat \pi$ = {:4.4f}\nerror = {:4.4f}%'
             .format(pi,error), alpha=0)
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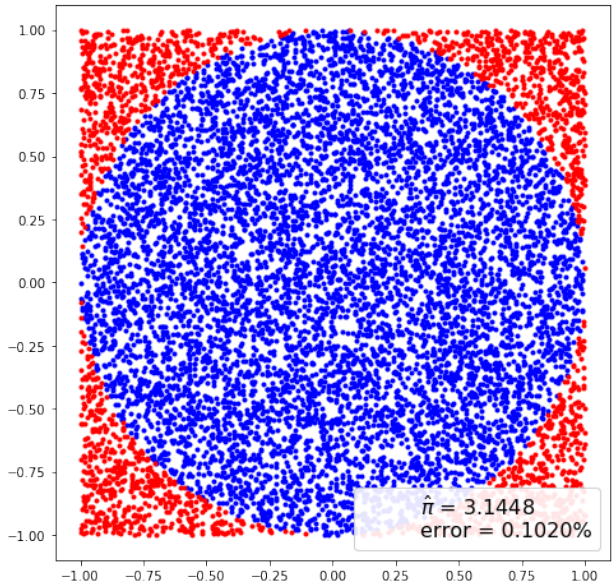

In [7]:
```
import numpy as np
import random
import matplotlib.pyplot as plt

def mc_pi_aprox(N=10000):
    plt.figure(figsize=(8,8))  # tamaño de la figura
    x, y = np.random.uniform(-1, 1, size=(2, N))
    interior = (x**2 + y**2) <= 1
    pi = interior.sum() * 4 / N
    error = abs((pi - np.pi) / pi) * 100
    exterior = np.invert(interior)
    plt.plot(x[interior], y[interior], 'b.')
    plt.plot(x[exterior], y[exterior], 'r.')
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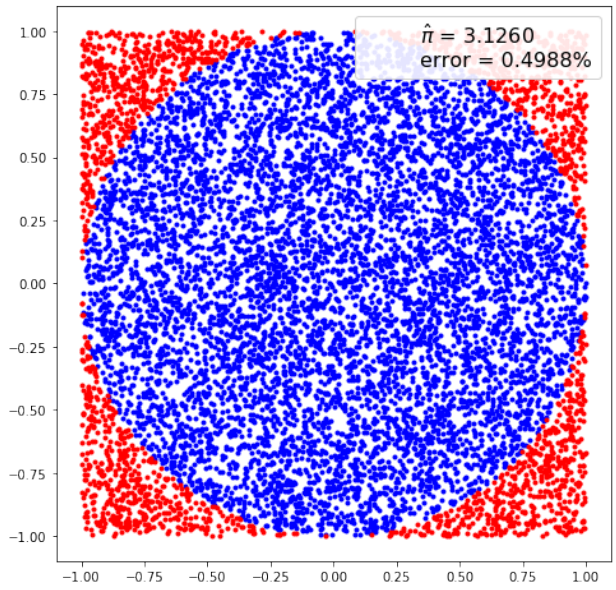
```
        plt.plot(0, 0, label='$\hat \pi$ = {:4.4f}\nerror = {:4.4f}%'
                 .format(pi,error), alpha=0)
        plt.axis('square')
        plt.legend(frameon=True, framealpha=0.9, fontsize=16)

    mc_pi_aprox()
```



In [8]:
```
import numpy as np
import random
import matplotlib.pyplot as plt

def mc_pi_aprox(N=10000):
    plt.figure(figsize=(8,8))  # tamaño de la figura
    x, y = np.random.uniform(-1, 1, size=(2, N))
    interior = (x**2 + y**2) <= 1
    pi = interior.sum() * 4 / N
    error = abs((pi - np.pi) / pi) * 100
    exterior = np.invert(interior)
    plt.plot(x[interior], y[interior], 'b.')
    plt.plot(x[exterior], y[exterior], 'r.')
    plt.plot(0, 0, label='$\hat \pi$ = {:4.4f}\nerror = {:4.4f}%'
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mc_pi_aprox()
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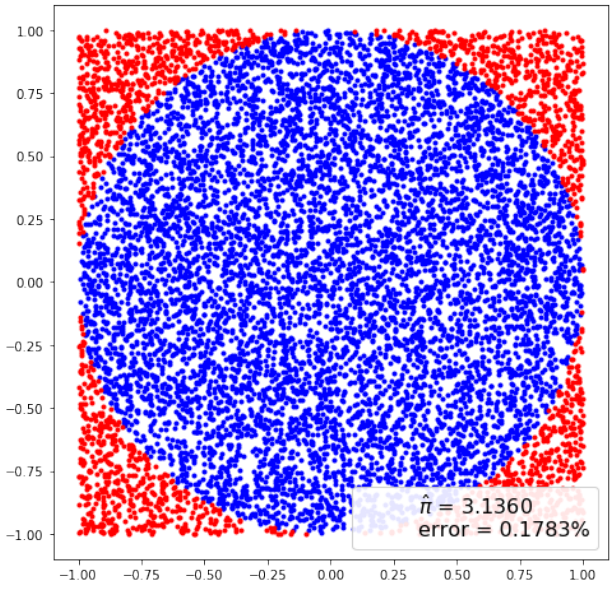
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
$\hat{\pi}$ = 3.1360
error = 0.1783%