

Experiment -15

```
import math

# Iris dataset
data = [
    [5.1, 3.5, 1.4, 0.2, 'Setosa'],
    [4.9, 3.0, 1.4, 0.2, 'Setosa'],
    [5.5, 2.3, 4.0, 1.3, 'Versicolor'],
    [6.5, 2.8, 4.6, 1.5, 'Versicolor'],
    [6.3, 3.3, 6.0, 2.5, 'Virginica'],
    [5.8, 2.7, 5.1, 1.9, 'Virginica']
]

# Separate by class
classes = {}
for row in data:
    classes.setdefault(row[-1], []).append(row[:-1])

# Mean & variance
def mean(nums): return sum(nums)/len(nums)
def var(nums):
    m = mean(nums)
    return sum((x-m)**2 for x in nums)/len(nums) + 1e-6 # FIX

# Gaussian function
def gaussian(x, m, v):
    return (1/math.sqrt(2*math.pi*v)) * math.exp(-(x-m)**2/(2*v))

# Train
stats = {}
for c in classes:
    stats[c] = [(mean(col), var(col)) for col in zip(*classes[c])]

# Predict
def predict(sample):
    probs = {}
    for c in stats:
        probs[c] = 1
        for i in range(len(sample)):
            m, v = stats[c][i]
            probs[c] *= gaussian(sample[i], m, v)
    return max(probs, key=probs.get)
```

```
# Test
test = [5.9, 3.0, 5.1, 1.8]
print("Test Flower:", test)
print("Predicted Class:", predict(test))
```

Output:



The screenshot shows a Jupyter Notebook output cell. The output text is as follows:

```
Test Flower: [5.9, 3.0, 5.1, 1.8]
Predicted Class: Virginica

=== Code Execution Successful ===
```

At the bottom of the window, there is a watermark that reads: "Activate Windows Go to Settings to activate Windows."