In [6]:
```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
```

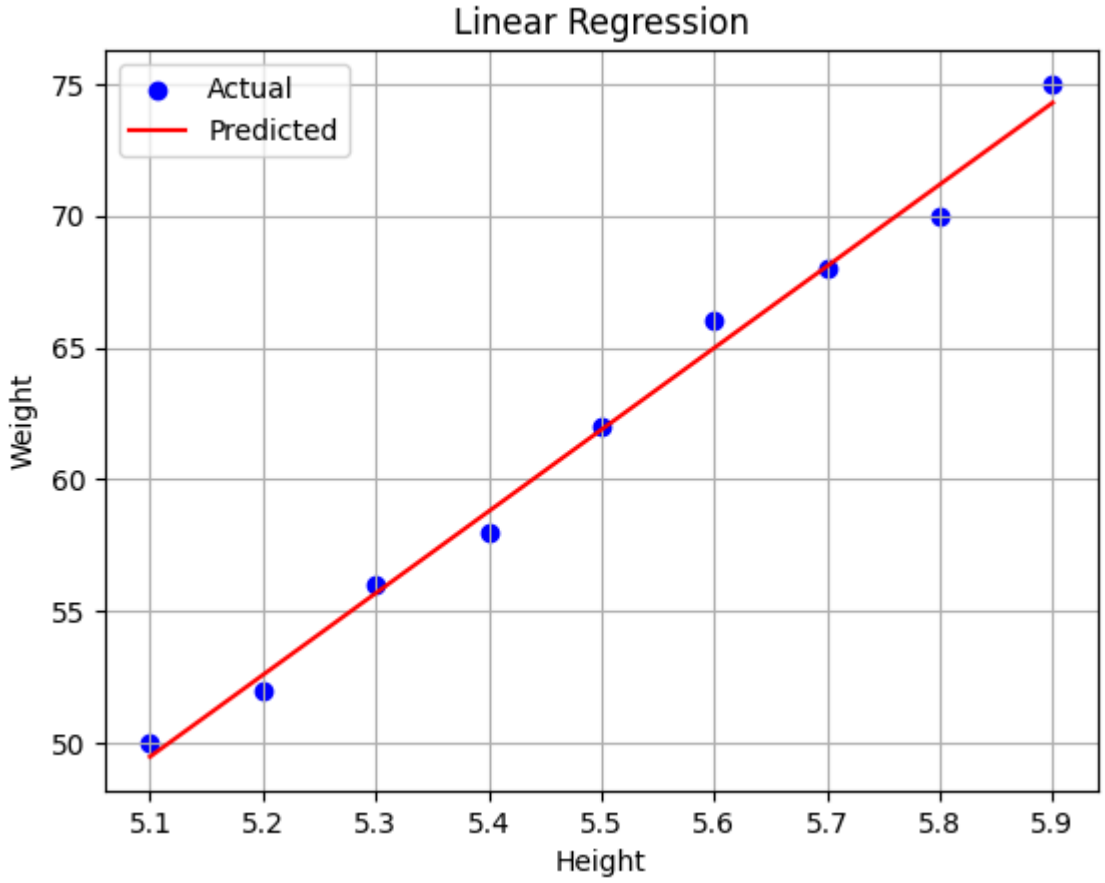
In [7]:
```
X = np.array([5.1, 5.2, 5.3,5.4,5.5,5.6,5.7,5.8,5.9]).reshape(-1, 1)
y = np.array([50,52,56,58,62,66,68,70,75])
```

In [8]:
```
print(X)
```

```
[[5.1]
 [5.2]
 [5.3]
 [5.4]
 [5.5]
 [5.6]
 [5.7]
 [5.8]
 [5.9]]
```

In [9]:
```
model = LinearRegression()
model.fit(X, y)
y_pred = model.predict(X)
```

In [16]:
```
plt.scatter(X, y, color='blue', label='Actual')
plt.plot(X, y_pred, color='red', label='Predicted')
plt.title('Linear Regression')
plt.xlabel('Height')
plt.ylabel('Weight')
plt.legend()
plt.grid(True)
plt.show()
```



In [11]:
```
print("Linear Regression R² Score:", r2_score(y, y_pred))
```

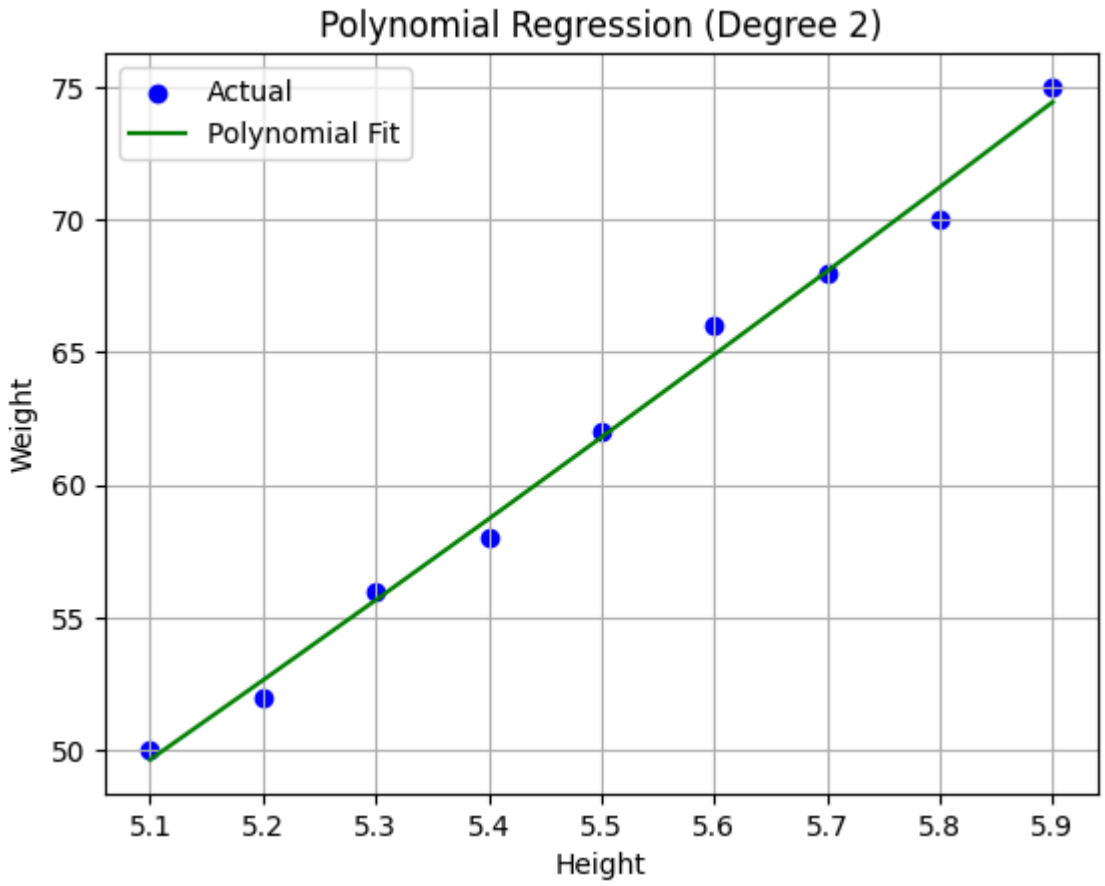
```
Linear Regression R² Score: 0.9926166794185157
```

In [12]:
```
from sklearn.preprocessing import PolynomialFeatures
```

In [13]:
```
poly = PolynomialFeatures(degree=2)
X_poly = poly.fit_transform(X)
```

In [14]:
```
poly_model = LinearRegression()
poly_model.fit(X_poly, y)
y_poly_pred = poly_model.predict(X_poly)
```

In [17]:
```
plt.scatter(X, y, color='blue', label='Actual')
plt.plot(X, y_poly_pred, color='green', label='Polynomial Fit')
plt.title('Polynomial Regression (Degree 2)')
plt.xlabel('Height')
plt.ylabel('Weight')
plt.legend()
plt.grid(True)
plt.show()
```


Polynomial Regression (Degree 2)
Actual
Polynomial Fit
Weight
Height
75
70
65
60
55
50
5.1
5.2
5.3
5.4
5.5
5.6
5.7
5.8
5.9

In [ ]: