In [23]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [24]:
```
%matplotlib inline
```

In [25]:
```
MCW_OW_MERGE = pd.read_csv("C:\\Users\\Shay\\Documents\Yari\\Data analysis Python\\Data\\M
```

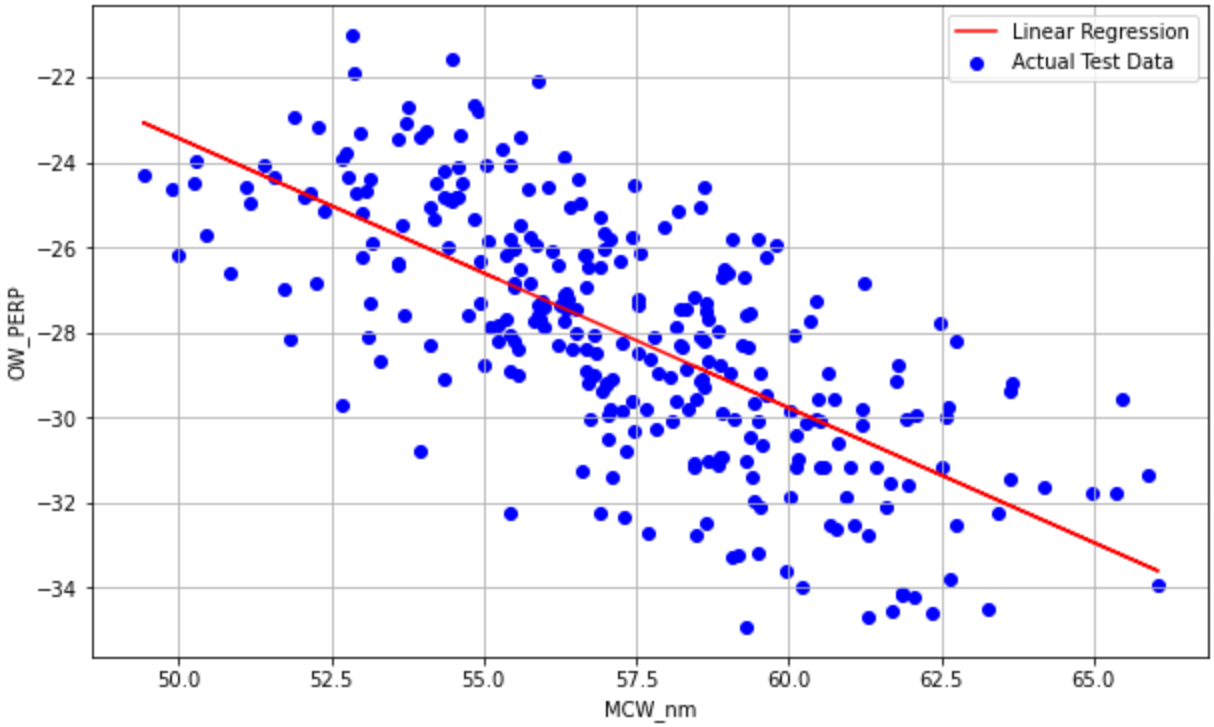
In [26]:
```
x = MCW_OW_MERGE['MCW_nm']
y = MCW_OW_MERGE['OW_PERP']
```

In [27]:
```
#Here we are creating a new variable called p1 to store our Coefficient and Intercept
p1 = np.polyfit(x,y,1)
```

In [28]:
```
print(p1)
```

```
[-0.63388974  8.25549861]
```

In [29]:
```
plt.figure(figsize=(10,6))
plt.scatter(x, y, label = 'Actual Test Data', color='blue')
plt.plot(x, np.polyval(p1,x), label = 'Linear Regression', color ='r')
plt.xlabel("MCW_nm")
plt.ylabel("OW_PERP")
plt.grid(True)
plt.legend()
plt.show()
```



In [30]:
```
#Here we are creatin a new table where RADIUS Values= OD(0)
MCW_OW_MERGE1 = MCW_OW_MERGE[MCW_OW_MERGE['RADIUS'] == 'OD']
```

In [56]:
```
MCW_OW_MERGE1.to_csv('C:\\Users\\Shay\\Documents\\Yari\\Data Analysis Python\\Data\\MCW_OW
```

In [45]:
```
MCW_OW_MERGE1['MCW_nm'].mean()
```

Out[45]:
```
58.73365387031249
```



```
['OW_PERP'].mean()
```

In [46]:

Out[46]: -27.91781250000001

In [47]:
```
MCW_OW_MERGE1['CONV_AVE'].mean()
```

Out[47]: -34.546875

In [31]:
```
#Here we are creatin a new table where RADIUS Values= MD(1)
MCW_OW_MERGE2 = MCW_OW_MERGE[MCW_OW_MERGE['RADIUS'] == 'MD']
```

In [57]:
```
MCW_OW_MERGE2.to_csv('C:\\Users\\Shay\\Documents\\Yari\\Data Analysis Python\\Data\\MCW_OW
```

In [48]:
```
MCW_OW_MERGE2['MCW_nm'].mean()
```

Out[48]: 55.678648509583354

In [49]:
```
MCW_OW_MERGE2['OW_PERP'].mean()
```

Out[49]: -27.950208333333347

In [50]:
```
MCW_OW_MERGE2['CONV_AVE'].mean()
```

Out[50]: -38.5078125

In [32]:
```
#Here we are creatin a new table where RADIUS Values= ID(2)
MCW_OW_MERGE3 = MCW_OW_MERGE[MCW_OW_MERGE['RADIUS'] == 'ID']
```

In [58]:
```
MCW_OW_MERGE3.to_csv('C:\\Users\\Shay\\Documents\\Yari\\Data Analysis Python\\Data\\MCW_OW
```

In [51]:
```
MCW_OW_MERGE3['MCW_nm'].mean()
```

Out[51]: 57.54261008020833

In [52]:
```
MCW_OW_MERGE3['OW_PERP'].mean()
```

Out[52]: -28.365937499999987

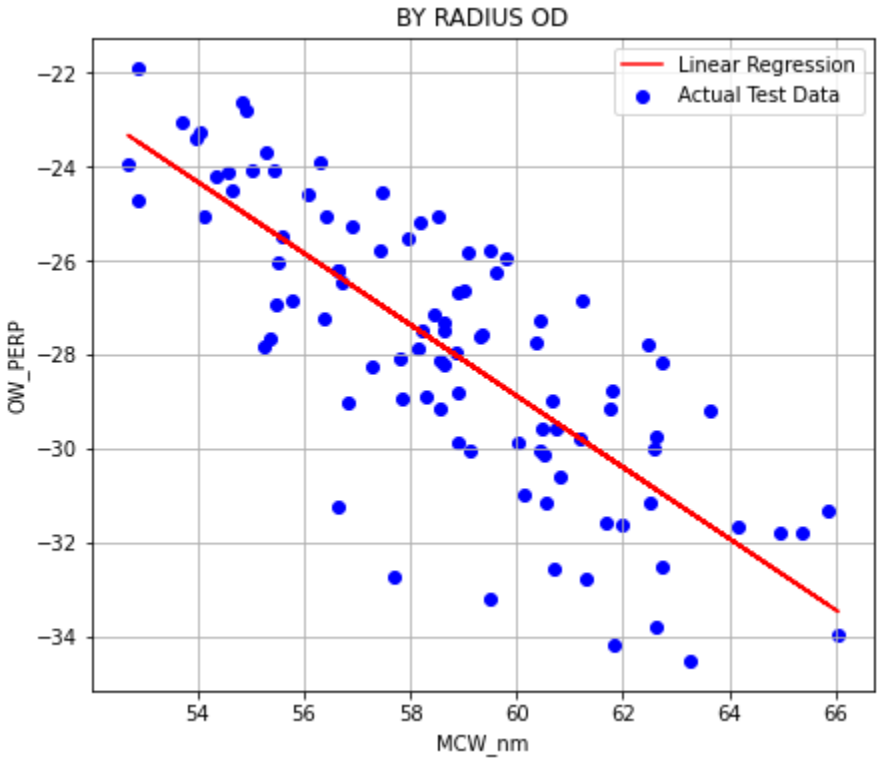
In [53]:
```
MCW_OW_MERGE3['CONV_AVE'].mean()
```

Out[53]: -40.71666667

In [33]:
```
x1 = MCW_OW_MERGE1['MCW_nm']
y1 = MCW_OW_MERGE1['OW_PERP']
```

In [34]:
```
p2 = np.polyfit(x1,y1,1)
```

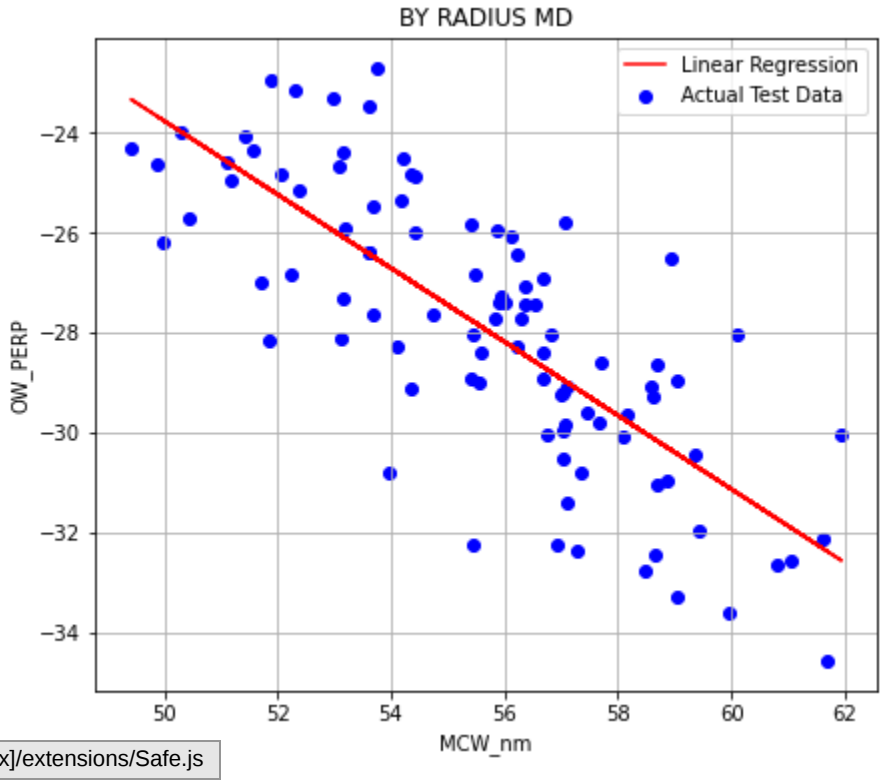
In [59]:
```
plt.figure(figsize=(7,6))
plt.scatter(x1, y1, label = 'Actual Test Data', color='blue')
plt.plot(x1, np.polyval(p2,x1), label = 'Linear Regression', color ='r')
plt.xlabel("MCW_nm")
plt.ylabel("OW_PERP")
plt.grid(True)
plt.legend()
plt.title('BY RADIUS OD')
plt.show()
```



In [36]:
```
x2 = MCW_OW_MERGE2['MCW_nm']
y2 = MCW_OW_MERGE2['OW_PERP']
```

In [37]:
```
p3 = np.polyfit(x2,y2,1)
```

In [61]:
```
plt.figure(figsize=(7,6))
plt.scatter(x2, y2, label = 'Actual Test Data', color='blue')
plt.plot(x2, np.polyval(p3,x2), label = 'Linear Regression', color ='r')
plt.xlabel("MCW_nm")
plt.ylabel("OW_PERP")
plt.grid(True)
plt.legend()
plt.title('BY RADIUS MD')
plt.show()
```



In [39]:
```
x3 = MCW_OW_MERGE3['MCW_nm']
y3 = MCW_OW_MERGE3['OW_PERP']
```

In [40]:
```
p4 = np.polyfit(x3,y3,1)
```

In [62]:
```
plt.figure(figsize=(7,6))
plt.scatter(x3, y3, label = 'Actual Test Data', color='blue')
plt.plot(x3, np.polyval(p4,x3), label = 'Linear Regression', color ='r')
plt.xlabel("MCW_nm")
plt.ylabel("OW_PERP")
plt.grid(True)
plt.legend()
plt.title('BY RADIUS ID')
plt.show()
```