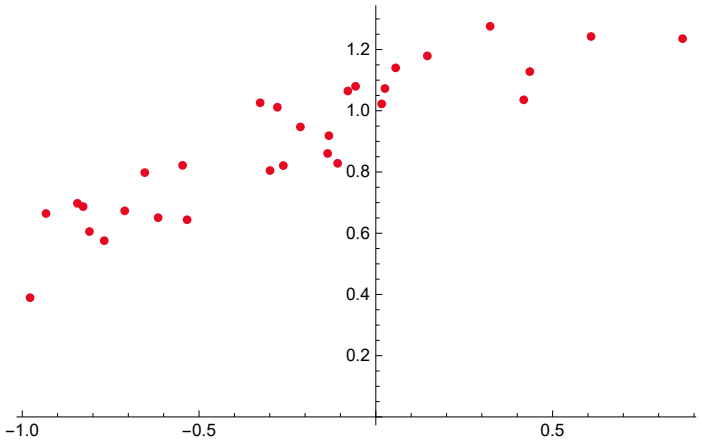
In[ ]:=
```
(*导入数据，第一列为x坐标，第二列为y坐标*)
Clear[data];
```
清除
```
data = N[Import["E:\\study_materials\\MachineLearning\\HW1\\data.txt", "Data"], 15];
```
.. 导入　　自然常数
```
(*绘制原始数据点图*)
img = ListPlot[data, PlotStyle → ColorData[3, "ColorList"]]
```
绘制点集　　绘图样式　　颜色数据

Out[ ]=

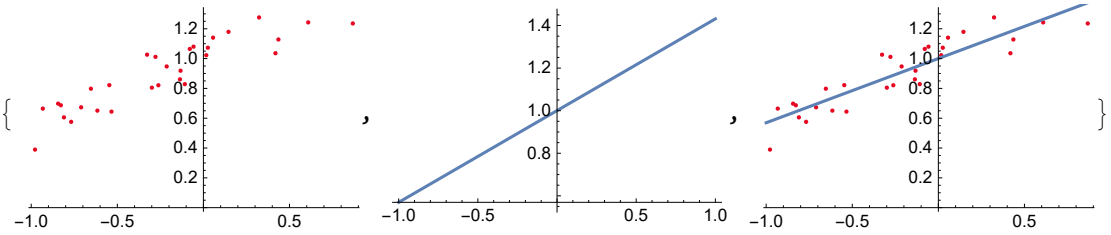


In[ ]:=
```
(*提取x,y坐标*)
x = data[[All, 1]];
```
全部
```
y = data[[All, 2]];
```
全部

In[ ]:=
```
(*线性回归*)
(*生成系数矩阵*)
A1 = Table[{1, data[[i, 1]]}, {i, 1, Length[data]}];
(*求解系数*)
wlinear = Inverse[Transpose[A1].A1].(Transpose[A1].y);
(*绘制模型图像*)
img1 = Plot[wlinear[[1]] + wlinear[[2]] * x, {x, -1, 1}];
(*计算二范数误差*)
y1 = wlinear[[1]] + wlinear[[2]] * x;
error1 = Sqrt[Sum[(y1[[i]] - y[[i]])^2, {i, 1, Length[y]}]];
(*输出相关结果*)
Print["二范数误差error=", NumberForm[error1, 15], "\n", "w0=",
 NumberForm[wlinear[[1]], 15], "\n", "w1=", NumberForm[wlinear[[2]], 15]]
{img, img1, Show[img, img1]}
```

```
二范数误差error=0.531194876522673
w0=1.00038680662317
w1=0.430838344703966
```

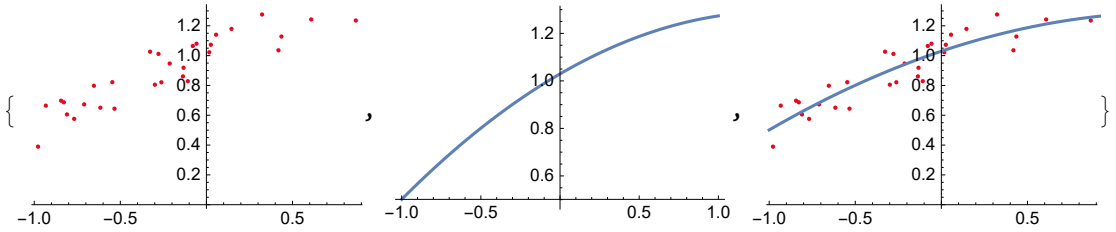
Out[ ]=



In[ ]:=
```
(*二次回归*)
(*生成系数矩阵*)
A1 = Table[{1, data[[i, 1]], data[[i, 1]]^2}, {i, 1, Length[data]}];
     表格                                      长度
(*求解系数*)
wquard = Inverse[Transpose[A1].A1].(Transpose[A1].y);
         逆      转置                转置
(*绘制模型图像*)
img2 = Plot[wquard[[1]] + wquard[[2]] * x + wquard[[3]] * x^2, {x, -1, 1}];
       绘图
(*计算二范数误差*)
y2 = wquard[[1]] + wquard[[2]] * x + wquard[[3]] * x^2;
error2 = Sqrt[Sum[(y2[[i]] - y[[i]])^2, {i, 1, Length[y]}]];
         …    求和                      长度
(*输出相关结果*)
Print["二范数误差error=", NumberForm[error2, 15],
打印                    数值近似
 "\n", "w0=", NumberForm[wquard[[1]], 15], "\n", "w1=",
              数值近似
 NumberForm[wquard[[2]], 15], "\n", "w2=", NumberForm[wquard[[3]], 15]]
 数值近似                                  数值近似
{img, img2, Show[img, img2]}
            显示
```

```
二范数误差error=0.492436111120306
w0=1.02956837465647
w1=0.386143334032323
w2=-0.142151113086161
```

Out[ ]=



可以看到，二次模型更好的回归拟合出更贴近原数据，从二范数的误差结果来看，也是二次模型更为适合一些。