理论证明　　23210980040　　加兴华

1. $E[(y_0-\hat f(x_0))^2] = E[(f(x_0)-\hat f(x_0)+\varepsilon)^2]$

$= (a)+(b)+(c).$

(a): $E[(f(x_0)-\hat f(x_0))^2]$

(b): $E[\varepsilon^2] = Var(\varepsilon) - E(\varepsilon)^2 = Var(\varepsilon).$

(c): $2E[\varepsilon(f(x_0)-\hat f(x_0))] = 2E\varepsilon\cdot E(\cdots) = 0.$

$E[(f(x_0)-\hat f(x_0))^2] = E[(f(x_0)-E\hat f(x_0)+E\hat f(x_0)-\hat f(x_0))^2]$

$= (d)+(e).$

(d): $E[(E\hat f(x_0)-\hat f(x_0))^2] = Var\,\hat f(x_0)$

(e): $E[(f(x_0)-E\hat f(x_0))^2+2(f(x_0)-E\hat f(x_0))(\hat f(x_0)-E\hat f(x_0))]$

$= (f(x_0)-E\hat f(x_0))^2 + 2(f(x_0)-E\hat f(x_0))(E\hat f(x_0)-E\hat f(x_0))$

$= (f(x_0)-E\hat f(x_0))^2 + 0 = [Bias\,\hat f(x_0)]^2$

$\therefore E[y_0-\hat f(x_0)]^2 = Var\,\varepsilon + (d) + (e).$

2. (1) 如何排班.

(2) 收集客流-时间数据
- 因变量：客流量
- 自变量：时间、是否周末、是否节假日