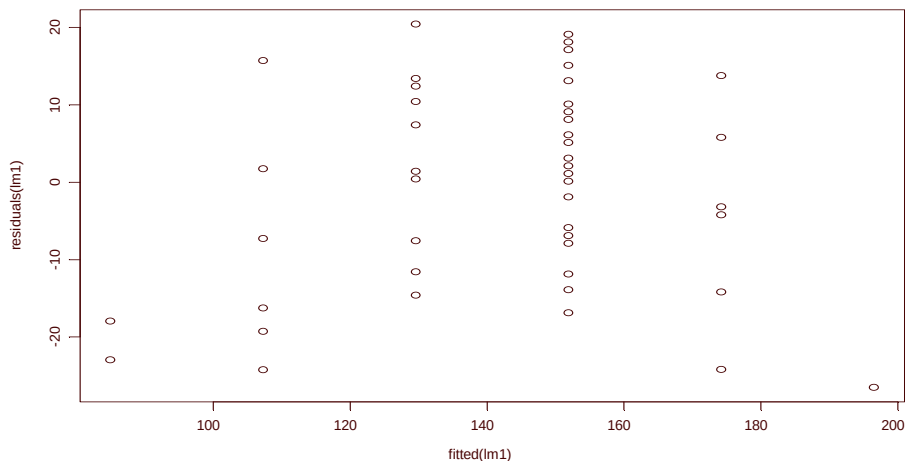


LAKE MARY LACK OF FIT CALCULATIONS IN S-PLUS

```
> read.table("lakemary.txt", header=T)
> lm1 <- lm(Length ~ Age, data=lakemary)
> plot(lm1) # Look at residuals ALWAYS!
> plot(fitted(lm1), residuals(lm1))
```



```
> anova(lm1) # for linear model fit
Analysis of Variance Table
Response: Length
Terms added sequentially (first to last)
      Df Sum of Sq  Mean Sq F Value Pr(F)
Age    1  32965.84  32965.84  210.665    0
Residuals 76  11892.84   156.48
```

```
> # Fit a one-way Analysis of Variance where Age is a grouping variable:
> aov1 <- lm(Length ~ as.factor(Age), data=lakemary)
> anova(aov1)
Analysis of Variance Table
Response: Length
Terms added sequentially (first to last)
      Df Sum of Sq  Mean Sq  F Value Pr(F)
as.factor(Age)  5   36046.00  7209.199  58.89946    0
Residuals 72    8812.68   122.398
```

Lack of Fit Test:

```
> anova(lm1, aov1) # compares two models (nested)
```

```
Analysis of Variance Table
Response: Length
```

	Terms	Resid. Df	RSS	Test Df	Sum of Sq	F Value	Pr(F)
1	Age	76	11892.84				
2	as.factor(Age)	72	8812.68	1 vs. 2	4	3080.153	6.291246 0.0002125467

```
> # Compare to Table 9.4 in CW
```

```
#Look at quadratic model
> lm2 <- lm(Length ~ Age + Age^2, data=lakemary)
```

```
> anova(lm2, aov1)
Analysis of Variance Table
Response: Length
```

	Terms	Resid. Df	RSS	Test Df	Sum of Sq	F Value	Pr(F)
1	Age + Age^2	75	8920.696				
2	as.factor(Age)	72	8812.684	1 vs. 2	3	108.0119	0.294154 0.8294927

Lack of Fit?