

Printout

Saturday, April 15, 2023

11:58 AM

Section 1

MANE 6313

Subsection 1

Week 14, Module B

Student Learning Outcome

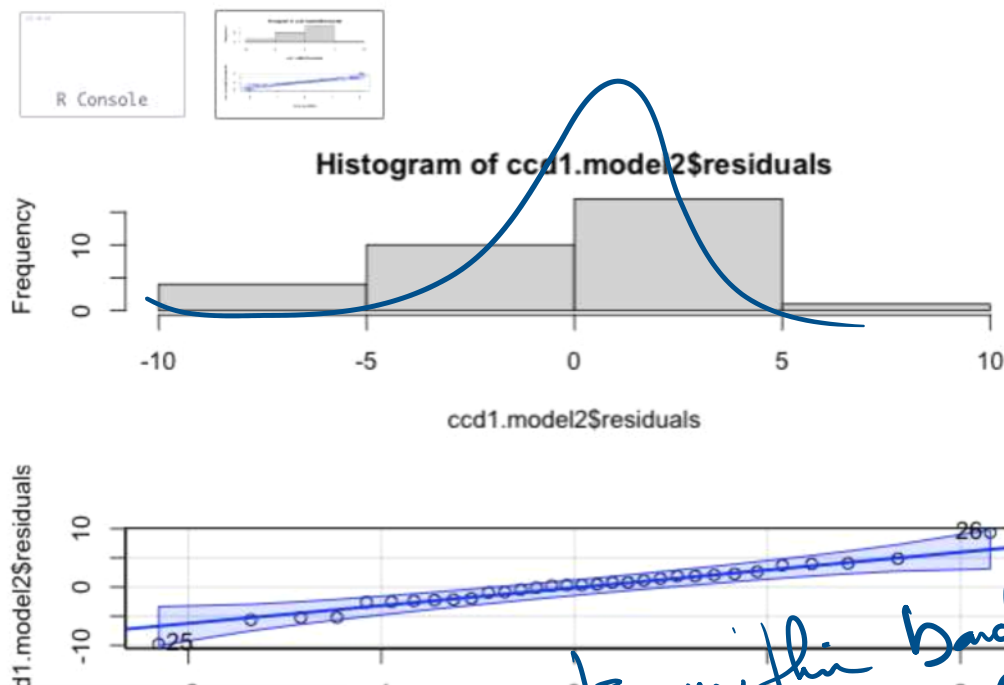
- Select an appropriate experimental design with one or more factors,
- Select an appropriate model with one or more factors,
- Evaluate statistical analyses of experimental designs,
- Assess the model adequacy of any experimental design, and
- Interpret model results.

Module Learning Outcome

Appraise Model Assumptions Using Residual Analysis

Normality Assumption

```
28 {r}  
29 par(mfrow=c(2,1))  
30 hist(ccd1.model2$residuals)  
31 library(car)  
32 qqPlot(ccd1.model2$residuals)  
33 ^
```



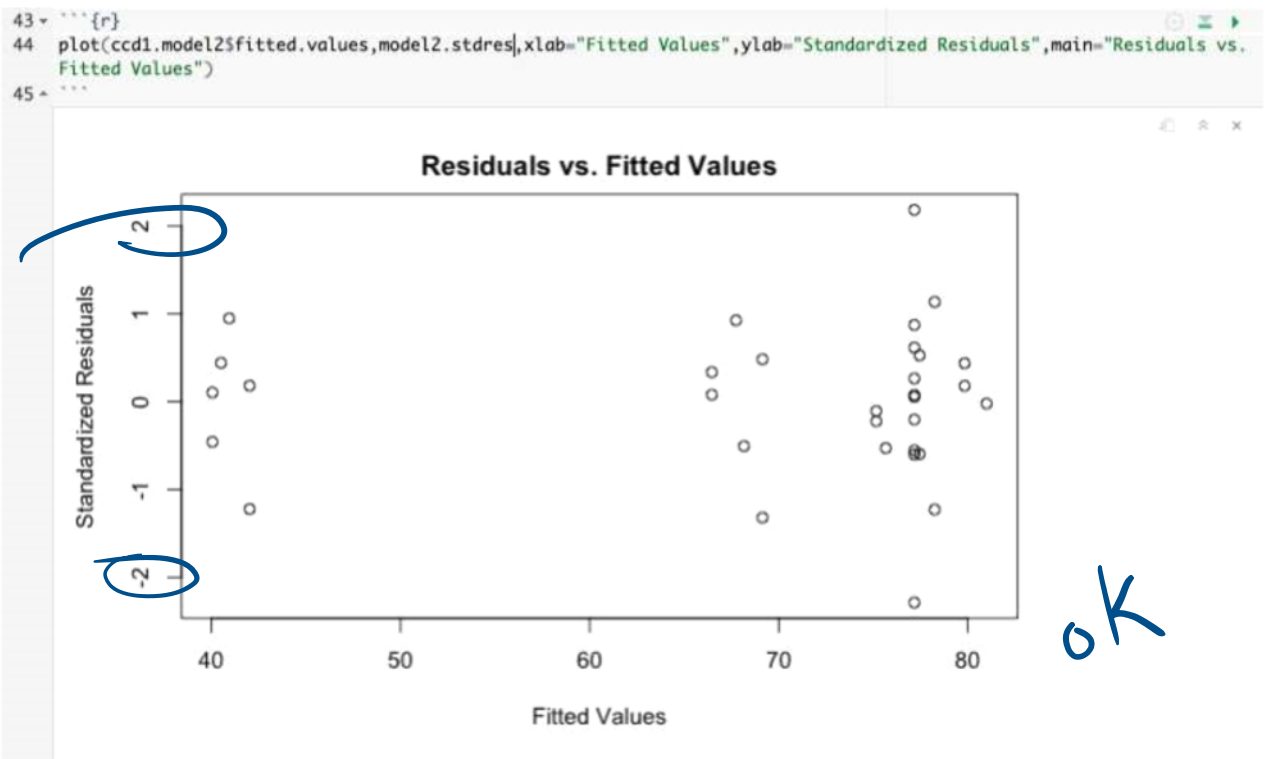
all points within bands,
so we are 95% confident
that sample is from a
normal distribution

Standardized Residuals

- Your instructor could not make rstandard() function work with residuals from rsm() model
- The code to create standardized residuals is shown below

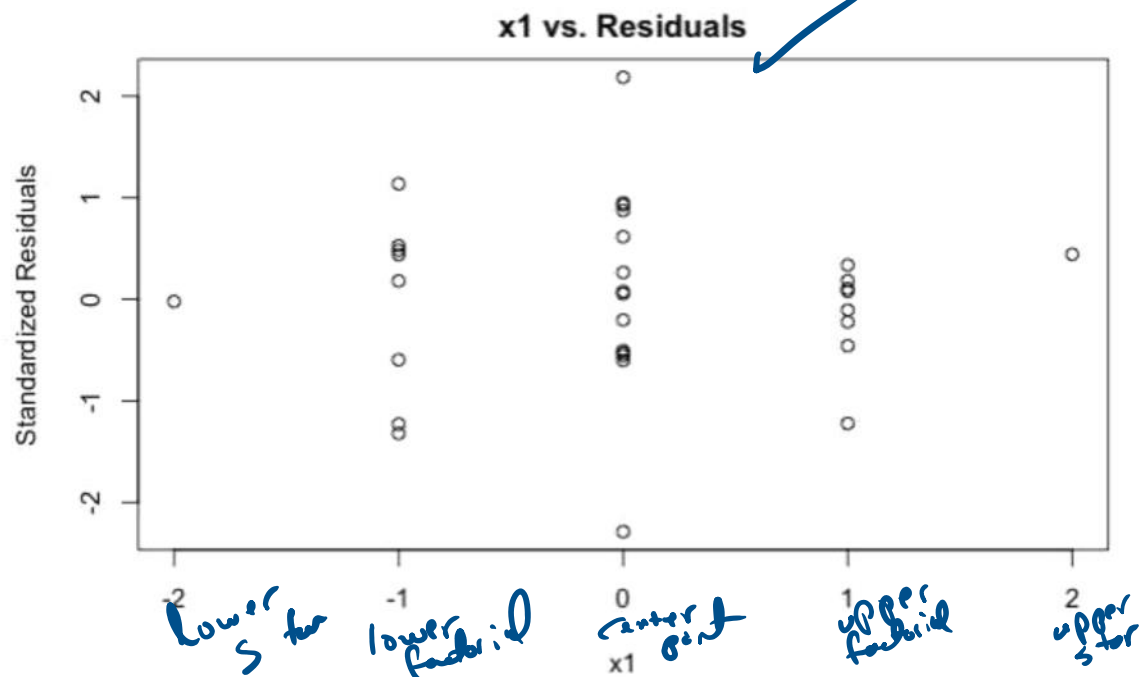
```
rmse.model2 <- sqrt(sum(ccd1.model2$residuals^2)/ccd1.model2$ccr)
model2.stdres <- ccd1.model2$residuals/rmse.model2
```

Residuals vs. Fitted Values



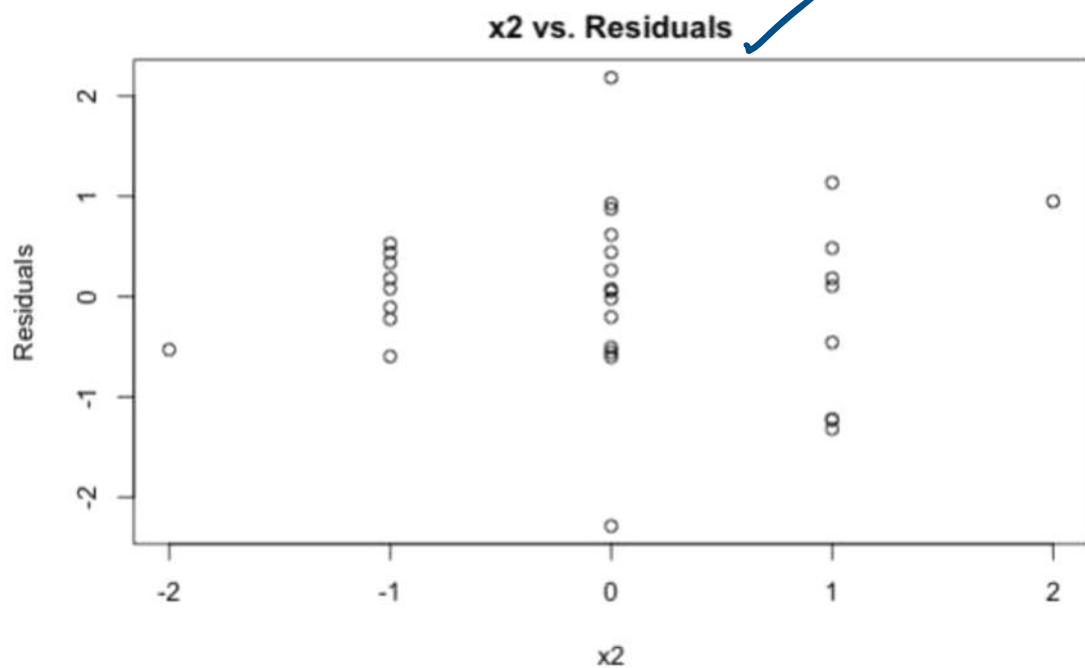
Residuals vs. x1

```
47 > plot({r})  
48 plot(ccd1.df$x1,model2.stdres,xlab="x1",ylab="Standardized Residuals",main="x1 vs. Residuals")  
49 >
```



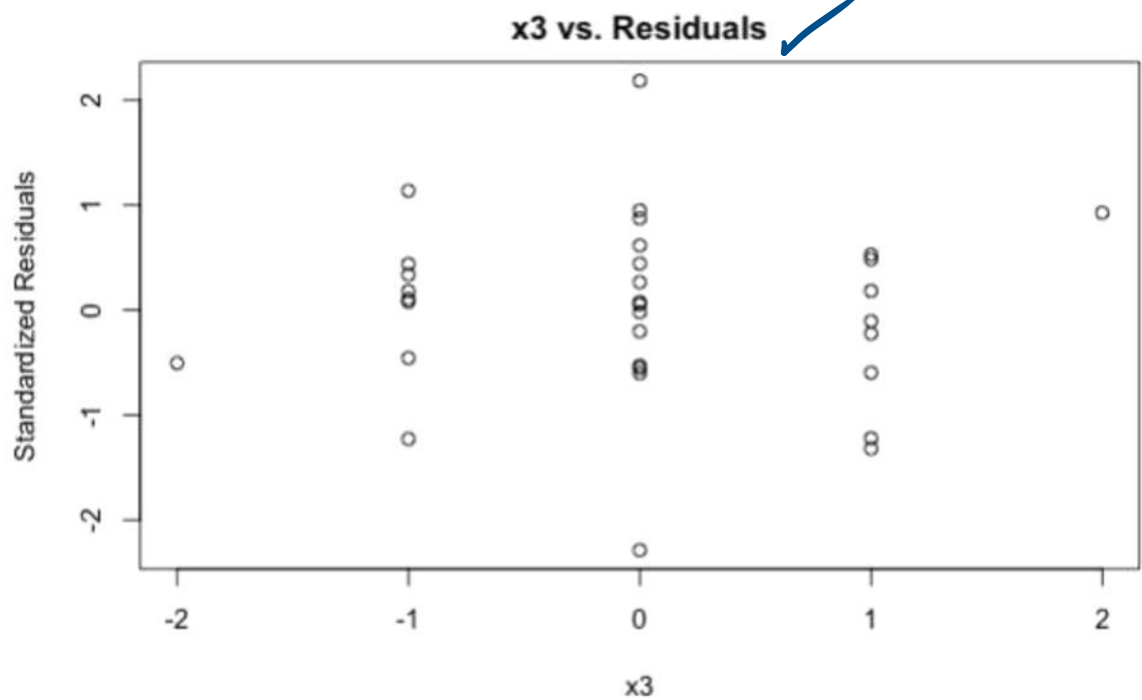
Residuals vs. x_2

```
51 + ""{r}  
52 plot(ccd1.df$x2,model2.stdres,xlab="x2",ylab="Standardized Residuals",main="x2 vs. Residuals")  
53 + ""
```



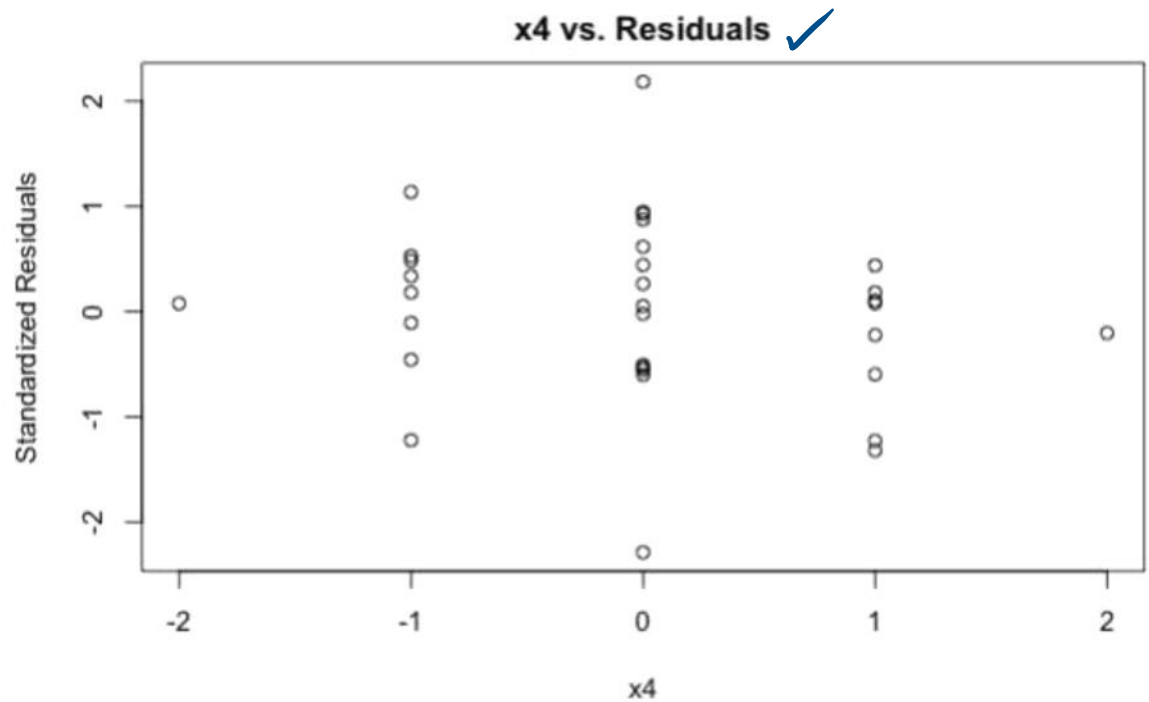
Residuals vs. x_3

```
56 > {r}  
57 plot(ccd1.df$x3,model2.stdres,xlab="x3",ylab="Standardized Residuals",main="x3 vs. Residuals")  
58 >
```



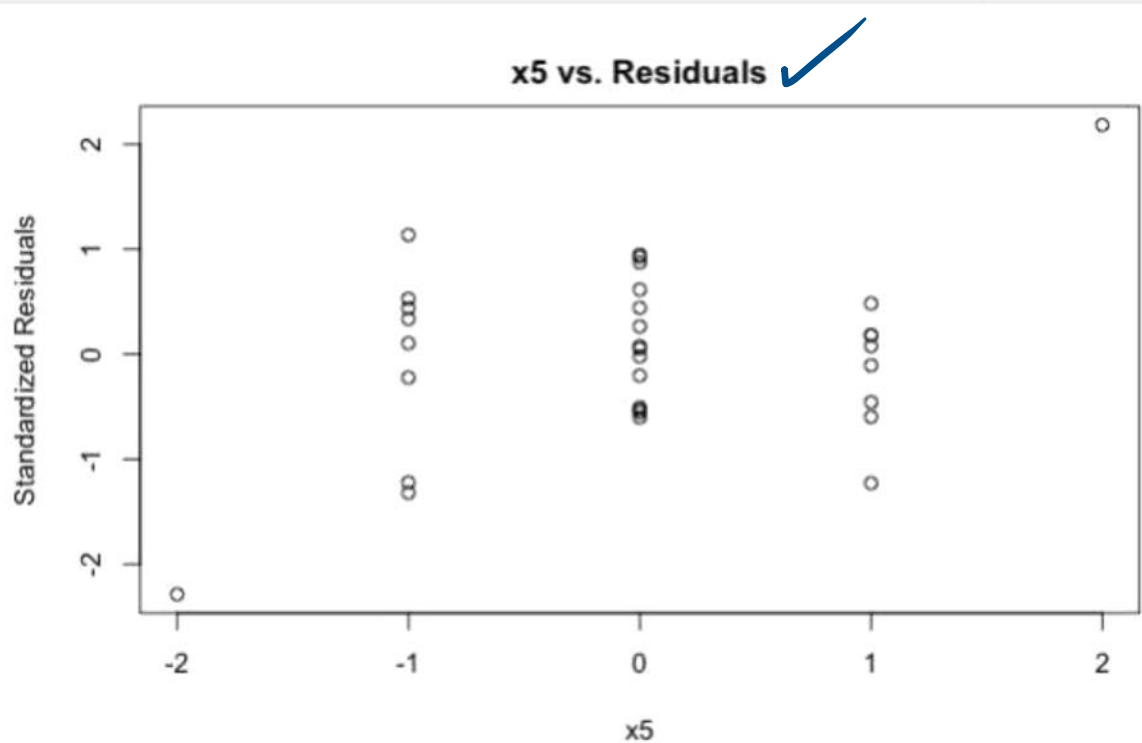
Residuals vs. x_4

```
60 ~ {r}  
61 plot(ccd1.df$x4,model2.stdres,xlab="x4",ylab="Standardized Residuals",main="x4 vs. Residuals")  
62 ~ {r}
```



Residuals vs. x5

```
64 ~ ``{r}  
65 plot(ccd1.df$x5,model2.stdres,xlab="x5",ylab="Standardized Residuals",main="x5 vs. Residuals")  
66 ~ ``
```



all residual tests are good
so all model assumptions are met