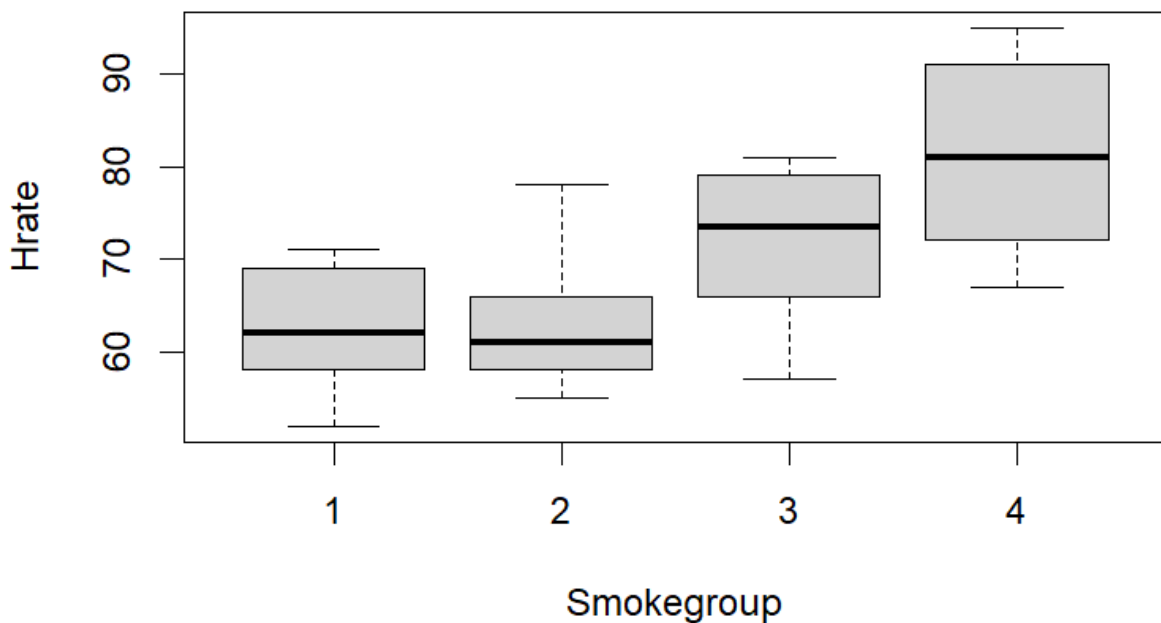


Hjartefrekvens og røyking

Hjartefrekvens 3 minutter etter hard fysisk økt

Nonsmokers	Light smokers	Moderate smokers	Heavy smokers
69	55	66	91
52	60	81	72
71	78	70	81
58	58	77	67
59	62	57	95
65	66	79	

```
Hrate=c(69,52,71,58,59,65,55,60,78,58,62,66,66,81,70,  
77,57,79,91,72,81,67,95)  
smoker=c(1,1,1,1,1,1, 2,2,2,2,2,2,3,3,3,3,3,3,4,4,4,4  
,4)  
plot(as.factor(smoker), Hrate, xlab="Smokegroup", ylab="Hrate")
```



```
> mod1=lm(Hrate~as.factor(smoker)-1)
> summary(mod1)
```

Call:

```
lm(formula = Hrate ~ as.factor(smoker) - 1)
```

Residuals:

	Min	1Q	Median	3Q	Max
	-14.667	-5.417	-1.167	7.000	14.833

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
as.factor(smoker)1	62.333	3.733	16.70	8.21e-13 ***
as.factor(smoker)2	63.167	3.733	16.92	6.48e-13 ***
as.factor(smoker)3	71.667	3.733	19.20	6.68e-14 ***
as.factor(smoker)4	81.200	4.089	19.86	3.62e-14 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9.143 on 19 degrees of freedom

Multiple R-squared: 0.9859, Adjusted R-squared: 0.9829

F-statistic: 332.1 on 4 and 19 DF, p-value: < 2.2e-16

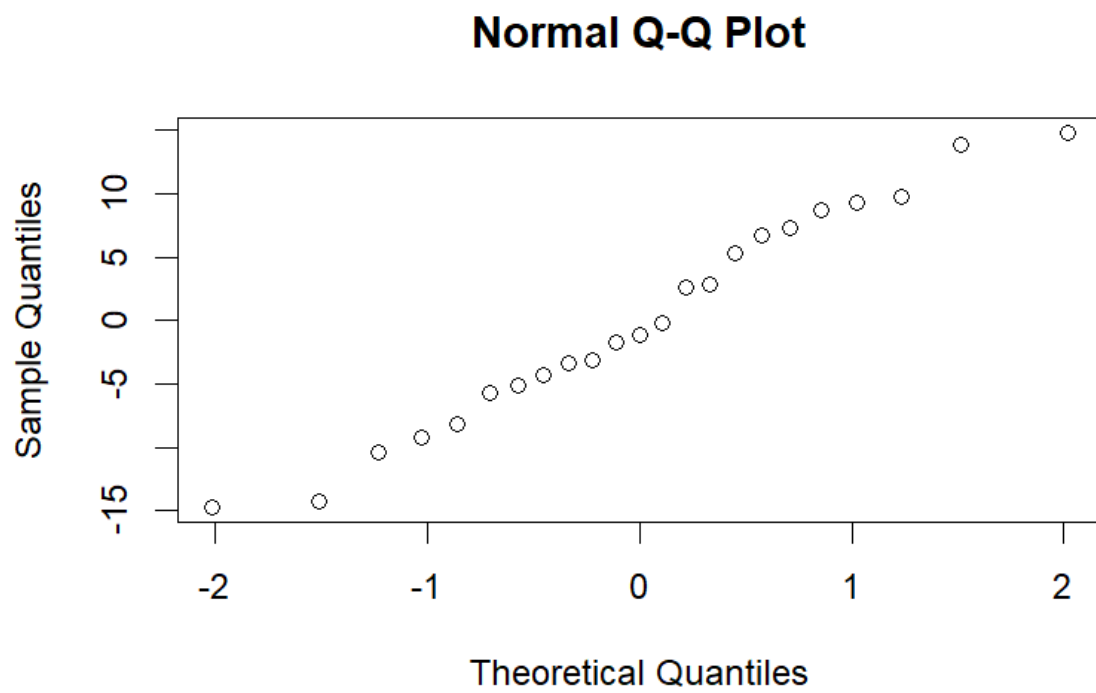
```
> mod2=aov(Hrate~as.factor(smoker))
```

```
> summary(mod2)
```

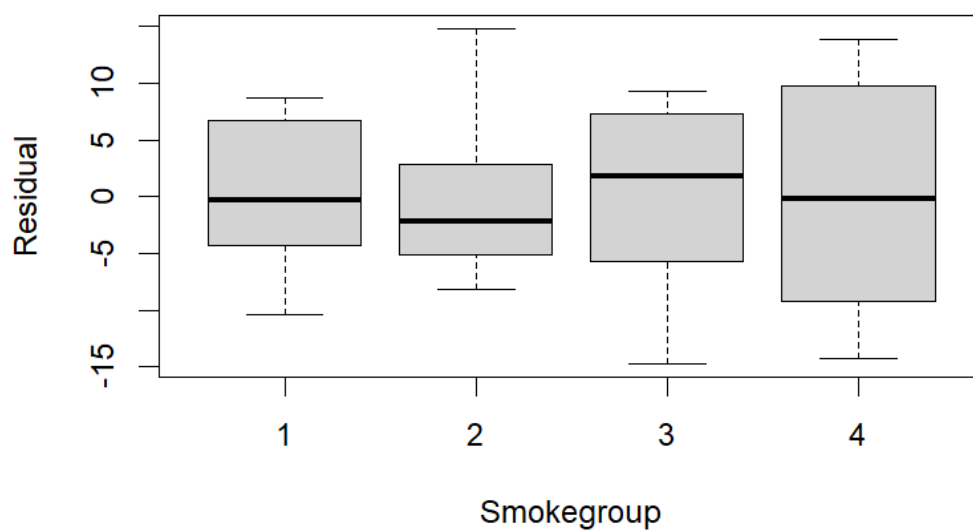
	Df	Sum Sq	Mean Sq	F value	Pr(>F)
as.factor(smoker)	3	1258	419.2	5.014	0.00997 *
Residuals	19	1588	83.6		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```
qqnorm(mod2$res)
```



```
plot(as.factor(smoker), mod2$res, xlab = "Smokegroup",  
     , ylab="Residual")
```



```
Hrate=c(69,52,71,58,59,65,55,60,78,58,62,66,66,81,70,77,57,79,91,72,81,67,95,84)
```

```
Smoker=c(1,1,1,1,1,1,2,2,2,2,2,2,3,3,3,3,3,3,4,4,4,4,4,4)
```

```
> mod3=aov(Hrate~as.factor(Smoker))
```

```
> summary(mod3)
```

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
as.factor(Smoker)	3	1464	488.0	6.12	0.00398 **
Residuals	20	1595	79.7		

```
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
> TukeyHSD(aov(Hrate~as.factor(Smoker)))
```

Tukey multiple comparisons of means
95% family-wise confidence level

```
Fit: aov(formula = Hrate ~ as.factor(Smoker))
```

```
$`as.factor(Smoker)`
```

	diff	lwr	upr	p adj
2-1	0.8333333	-13.596955	15.26362	0.9984448
3-1	9.3333333	-5.096955	23.76362	0.2978123
4-1	19.3333333	4.903045	33.76362	0.0063659
3-2	8.5000000	-5.930289	22.93029	0.3755571
4-2	18.5000000	4.069711	32.93029	0.0091463
4-3	10.0000000	-4.430289	24.43029	0.2438158