UG Anger-Anxiety data

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Data

The sample size is $N = 684$. The data are in **ggm**, but the names are wrong and do not correspond to Cox and Wermuth book Table 3.1.

```
data("anger")
nam <- c('Y','X','V','U')
dimnames(anger) <- list(nam,nam)
anger
```

```
        Y       X       V       U
Y 37.1926 24.9311 21.6056 15.6907
X 24.9311 44.8472 17.8072 21.8565
V 21.6056 17.8072 32.2462 18.3523
U 15.6907 21.8565 18.3523 43.1191
```

Correlations (lower triangle) an partial correlations (upper triangle)

```
round(correlations(anger),2)
```

```
     Y    X    V     U
Y 1.00 0.45 0.47 -0.04
X 0.61 1.00 0.02  0.33
V 0.62 0.47 1.00  0.32
U 0.39 0.50 0.49  1.00
```

Notice that all the marginal correlations are large while two partial correlations are quite small.

Test the hypotheses

$$Y \perp\!\!\!\perp U \mid XV, \quad \text{and} \quad X \perp\!\!\!\perp V \mid YU.$$

```
N <- 684
P <- parcor(anger)
dev1 <- -N * log(1 - P[1,4]^2)
dev1
```

```
[1] 1.221178
```

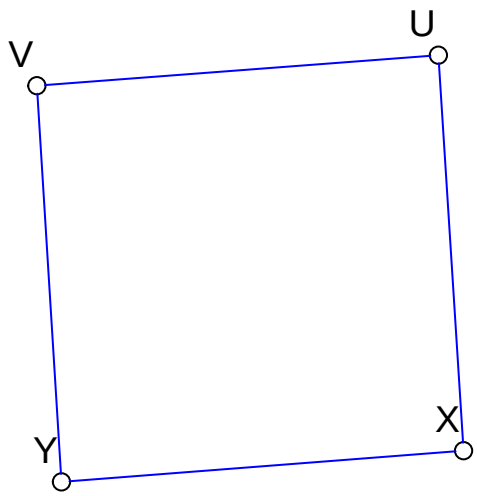
```
dev2 <- -N * log(1 - P[2,3]^2)
dev2
```

```
[1] 0.3312947
```

Both test are separately not sgnificant

Fitted UG model

```
G <- UG(~ X*U + V*U + Y*V + X*Y)
drawGraph(G)
```

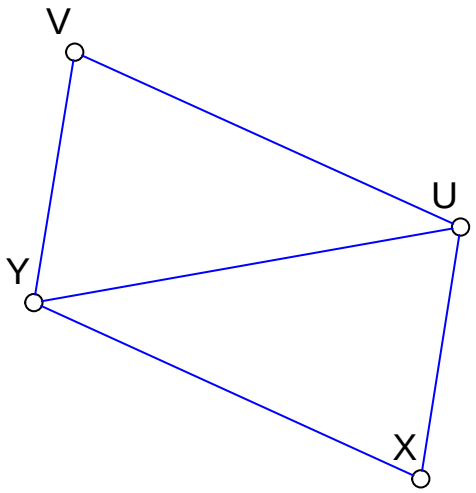


```
out <- fitConGraph(G, anger, 684)
out
```

```
$Shat
         Y        X        V        U
Y 37.19260 24.93110 21.60560 16.88615
X 24.93110 44.84720 17.02192 21.85650
V 21.60560 17.02192 32.24620 18.35230
U 16.88615 21.85650 18.35230 43.11910

$dev
[1] 2.103265

$df
[1] 2

$it
[1] 7
```

Single edge deviance for edge $Y \sim V$

```
G1 <-  UG(~ X*U + V*U + Y*V + X*Y + Y*U)
drawGraph(G1)
```




```
out1 <- fitConGraph(G1, anger, 684)
out1
```

```
$Shat
        Y        X        V       U
Y 37.1926 24.93110 21.60560 15.6907
X 24.9311 44.84720 17.35237 21.8565
V 21.6056 17.35237 32.24620 18.3523
U 15.6907 21.85650 18.35230 43.1191

$dev
[1] 0.3312947

$df
[1] 1

$it
[1] 2
```