Chapter 10

```
library(Ecdat)
```

```
## Loading required package: Ecfun
```

```
##
## Attaching package: 'Ecfun'
```

```
## The following object is masked from 'package:base':
##
##     sign
```

```
##
## Attaching package: 'Ecdat'
```

```
## The following object is masked from 'package:datasets':
##
##     Orange
```

```
library(forecast)
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
## Loading required package: timeDate
```

```
## This is forecast 7.3
```

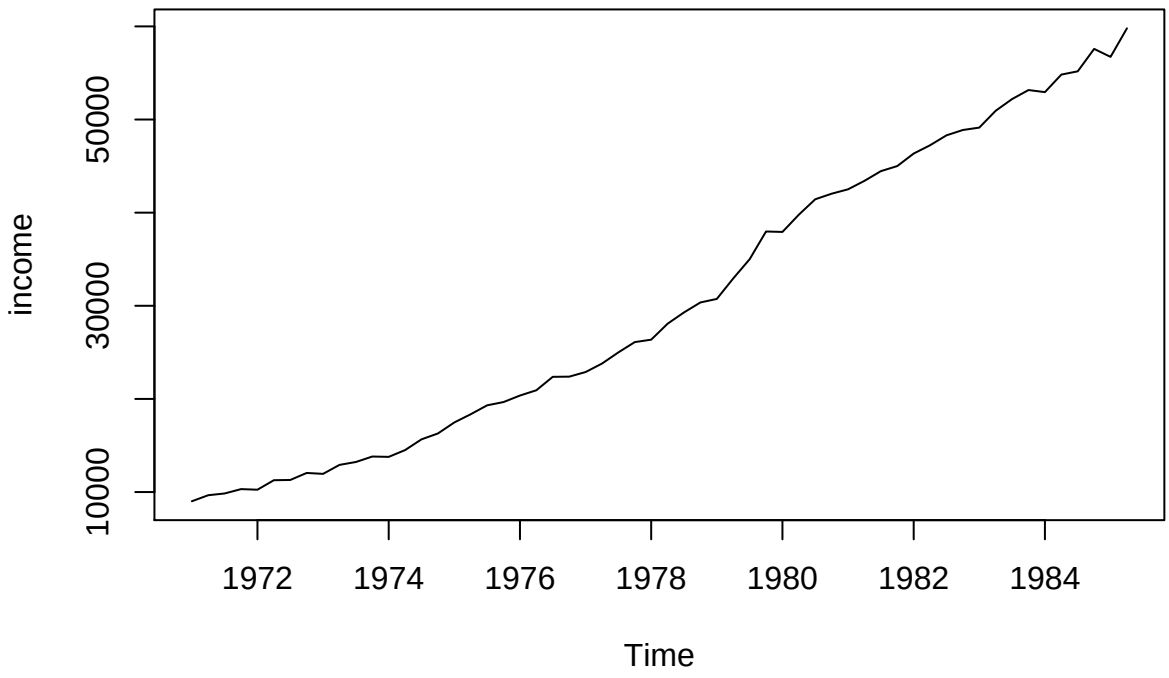
```
##
## Attaching package: 'forecast'
```

```
## The following object is masked from 'package:Ecfun':
##
##     BoxCox
```

```
data(IncomeUK)
income = IncomeUK[,1]
summary(income)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    9014   15820   27220   30600   44870   59790
```

```
plot(income)
```

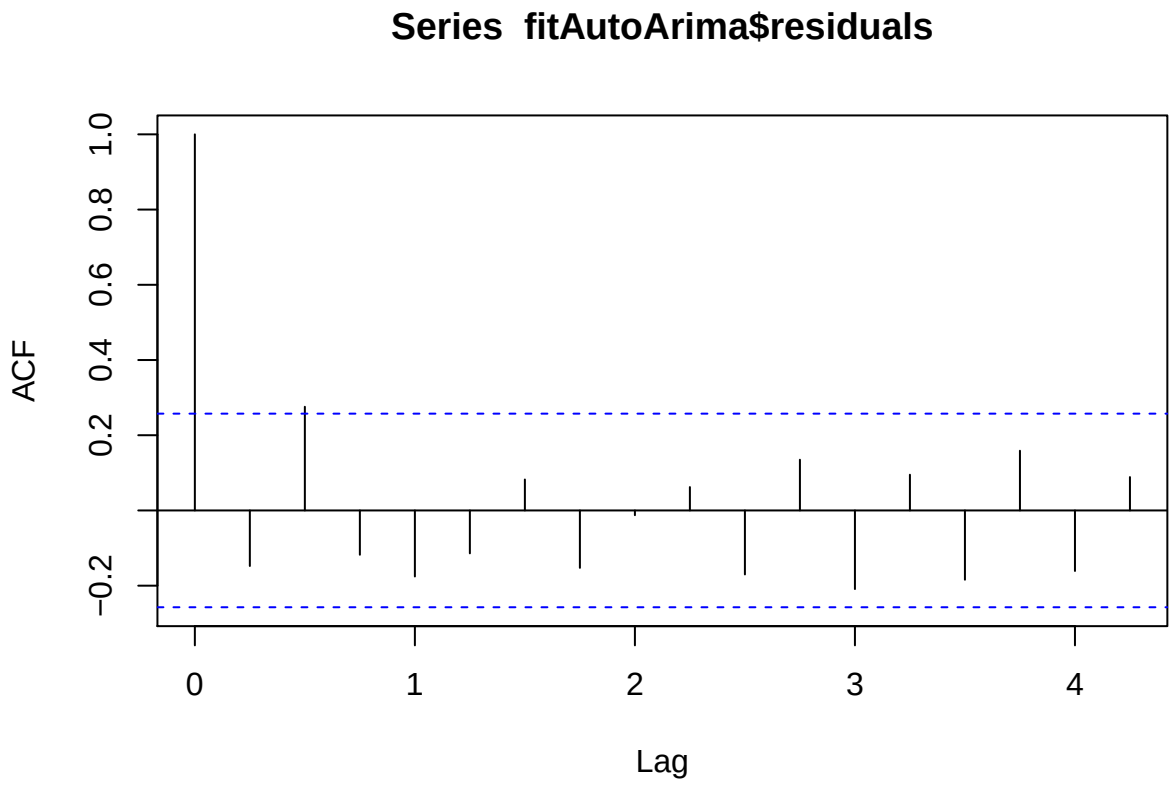



```
fitAutoArima = auto.arima(income, ic="bic")
fitAutoArima
```

```
## Series: income
## ARIMA(0,1,0)(0,1,0)[4]
##
## sigma^2 estimated as 486426:  log likelihood=-422.22
## AIC=846.43   AICc=846.51   BIC=848.4
```

So the fitted model here is ARIMA(0,1,0).

```
acf(fitAutoArima$residuals)
```




```
Box.test(fitAutoArima$residuals,lag=1,type="Ljung-Box")
```

```
##
##  Box-Ljung test
##
## data:  fitAutoArima$residuals
## X-squared = 1.3319, df = 1, p-value = 0.2485
```

I could not reject the null hypothesis due to the low p-value.Thus, there might not be any correlation in the residuals.