InitialTask

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R Markdown

#Question1

```r
#create dataset
sample1 <- data.frame(x1 = c(7, 8, 5, 7),
                      x2 = c(9, 10, 7, 11),
                      x3 = c(6, 7, 8, 7))
```

```r
#variane-covariance matrix
matrix <- cov(sample1)
```

```r
#compute pca
pca <- prcomp(sample1, scale. = TRUE)
pca
```

```
## Standard deviations (1, .., p=3):
## [1] 1.5178749 0.7361260 0.3926504
##
## Rotation (n x k) = (3 x 3):
##          PC1        PC2        PC3
## x1 -0.6233082 0.1654420  0.7642747
## x2 -0.5811197 0.5559861 -0.5942890
## x3  0.5232464 0.8145603  0.2504091
```

```r
names(pca)
```

```
## [1] "sdev"     "rotation" "center"    "scale"     "x"
```

```r
#loadings for the first principal component
loadings_PC1 <- pca$rotation[,1]
loadings_PC1
```

```
##         x1         x2         x3
## -0.6233082 -0.5811197  0.5232464
```

```r
#Calculate the proportion of variance explained by the first two PCs
PVE <- sum(pca$sdev[1:2]^2)/sum(pca$sdev^2)
PVE
```

```
## [1] 0.9486086
```