2447209_LAB2.R

anjaney

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```r
# vectors of student names and marks
student_names <- c("Anjaney", "Dave", "Shrey")
math_marks <- c(100, 99, 97)
science_marks <- c(100, 99, 96)
english_marks <- c(100, 98, 95)

# matrix to rows represent students and columns represent subjects
student_matrix <- matrix(c(math_marks, science_marks, english_marks), nrow = 3, byrow = TRUE)

# Assigning row and column names
rownames(student_matrix) <- student_names
colnames(student_matrix) <- c("Math", "Science", "English")


print(student_matrix)
```

```
##         Math Science English
## Anjaney  100      99      97
## Dave     100      99      96
## Shrey    100      98      95
```

```r
# Transpose the matrix to make subjects as rows and students as columns
transposed_matrix <- t(student_matrix)

# Printing the transposed matrix
print(transposed_matrix)
```

```
##         Anjaney Dave Shrey
## Math        100  100   100
## Science      99   99    98
## English      97   96    95
```

```r
# Creating dataframes for midterm and endterm scores
midterm <- data.frame(Student = c("Anjaney", "Dave", "Shrey"),
                      Math = c(100, 99, 98),
                      Science = c(100, 99, 98),
                      English = c(100, 99, 98))

endterm <- data.frame(Student = c("Anjaney", "Dave", "Shrey"),
                      Math = c(100, 99, 98),
```

```
                     Science = c(100, 99, 98),
                     English = c(100, 99, 98))

# Mergeing the two dataframes by student names
merged_data <- merge(midterm, endterm, by = "Student", suffixes = c("_midterm", "_endterm"))

# Compute total and average marks for each student
merged_data$total_midterm <- rowSums(merged_data[, 2:4])
merged_data$total_endterm <- rowSums(merged_data[, 5:7])
merged_data$average_midterm <- rowMeans(merged_data[, 2:4])
merged_data$average_endterm <- rowMeans(merged_data[, 5:7])

# Printing merged data with totals and averages

print(merged_data)
```

```
##   Student Math_midterm Science_midterm English_midterm Math_endterm
## 1 Anjaney          100             100             100          100
## 2    Dave           99              99              99           99
## 3   Shrey           98              98              98           98
##   Science_endterm English_endterm total_midterm total_endterm average_midterm
## 1             100             100           300           300             100
## 2              99              99           297           297              99
## 3              98              98           294           294              98
##   average_endterm
## 1             100
## 2              99
## 3              98
```

```
library(reshape2)

# Melt the merged data frame into a long format
melted_data <- melt(merged_data, id.vars = "Student",
                    measure.vars = c("Math_midterm", "Science_midterm", "English_midterm",
                                     "Math_endterm", "Science_endterm", "English_endterm"))



print(melted_data)
```

```
##    Student        variable value
## 1  Anjaney    Math_midterm   100
## 2     Dave    Math_midterm    99
## 3    Shrey    Math_midterm    98
## 4  Anjaney Science_midterm   100
## 5     Dave Science_midterm    99
## 6    Shrey Science_midterm    98
## 7  Anjaney English_midterm   100
## 8     Dave English_midterm    99
## 9    Shrey English_midterm    98
## 10 Anjaney    Math_endterm   100
## 11    Dave    Math_endterm    99
```

```
## 12   Shrey    Math_endterm    98
## 13 Anjaney Science_endterm   100
## 14    Dave Science_endterm    99
## 15   Shrey Science_endterm    98
## 16 Anjaney English_endterm   100
## 17    Dave English_endterm    99
## 18   Shrey English_endterm    98
```

```r
# Casting the data back to wide format to analyze grade distributions
wide_data <- dcast(melted_data, Student ~ variable, value.var = "value")


print(wide_data)
```

```
##   Student Math_midterm Science_midterm English_midterm Math_endterm
## 1 Anjaney          100             100             100          100
## 2    Dave           99              99              99           99
## 3   Shrey           98              98              98           98
##   Science_endterm English_endterm
## 1             100             100
## 2              99              99
## 3              98              98
```