LAB1.R

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```r
# Task 1: Create vectors for employee names, departments, and performance scores
employee_names <- c("Alice", "Bob", "Charlie", "David", "Eve", "Frank", "Grace", "Hank", "Ivy", "Jack",
departments <- c("HR", "HR", "HR", "HR", "IT", "IT", "IT", "IT", "Sales", "Sales", "Sales", "Sales")
Q1_scores <- c(85, 88, 90, 75, 95, 92, 85, 87, 80, 85, 88, 82)
Q2_scores <- c(82, 89, 91, 80, 93, 88, 84, 85, 78, 86, 87, 83)
Q3_scores <- c(84, 87, 92, 78, 94, 89, 86, 88, 81, 87, 90, 84)

# Task 2: Combine performance scores into a matrix
performance_matrix <- cbind(Q1_scores, Q2_scores, Q3_scores)
rownames(performance_matrix) <- employee_names
performance_matrix
```

```
##         Q1_scores Q2_scores Q3_scores
## Alice          85        82        84
## Bob            88        89        87
## Charlie        90        91        92
## David          75        80        78
## Eve            95        93        94
## Frank          92        88        89
## Grace          85        84        86
## Hank           87        85        88
## Ivy            80        78        81
## Jack           85        86        87
## Kelly          88        87        90
## Liam           82        83        84
```

```r
# Task 3: Convert the matrix into a data frame with department and employee names
employee_data <- data.frame(Employee = employee_names,
                            Department = departments,
                            Q1 = Q1_scores,
                            Q2 = Q2_scores,
                            Q3 = Q3_scores)
employee_data
```

```
##    Employee Department Q1 Q2 Q3
## 1     Alice         HR 85 82 84
## 2       Bob         HR 88 89 87
## 3   Charlie         HR 90 91 92
## 4     David         HR 75 80 78
## 5       Eve         IT 95 93 94
## 6     Frank         IT 92 88 89
```

```
## 7      Grace            IT 85 84 86
## 8       Hank            IT 87 85 88
## 9        Ivy         Sales 80 78 81
## 10      Jack         Sales 85 86 87
## 11     Kelly         Sales 88 87 90
## 12      Liam         Sales 82 83 84
```

```r
# Task 4: Modify employee performance scores in the matrix and data frame
# Let's increase Bob's Q1 score by 5 points
performance_matrix["Bob", "Q1_scores"] <- performance_matrix["Bob", "Q1_scores"] + 5
employee_data[employee_data$Employee == "Bob", "Q1"] <- employee_data[employee_data$Employee == "Bob",

performance_matrix
```

```
##          Q1_scores Q2_scores Q3_scores
## Alice           85        82        84
## Bob             93        89        87
## Charlie         90        91        92
## David           75        80        78
## Eve             95        93        94
## Frank           92        88        89
## Grace           85        84        86
## Hank            87        85        88
## Ivy             80        78        81
## Jack            85        86        87
## Kelly           88        87        90
## Liam            82        83        84
```

```r
employee_data
```

```
##      Employee Department Q1 Q2 Q3
## 1      Alice          HR 85 82 84
## 2        Bob          HR 93 89 87
## 3    Charlie          HR 90 91 92
## 4      David          HR 75 80 78
## 5        Eve          IT 95 93 94
## 6      Frank          IT 92 88 89
## 7      Grace          IT 85 84 86
## 8       Hank          IT 87 85 88
## 9        Ivy       Sales 80 78 81
## 10      Jack       Sales 85 86 87
## 11     Kelly       Sales 88 87 90
## 12      Liam       Sales 82 83 84
```

```r
# Task 5: Calculate the average performance score per employee and per department
# Average performance score per employee
employee_data$Average <- rowMeans(employee_data[, 3:5])
employee_data
```

```
##      Employee Department Q1 Q2 Q3  Average
## 1      Alice          HR 85 82 84 83.66667
## 2        Bob          HR 93 89 87 89.66667
```

```
## 3    Charlie       HR 90 91 92 91.00000
## 4     David        HR 75 80 78 77.66667
## 5       Eve        IT 95 93 94 94.00000
## 6     Frank        IT 92 88 89 89.66667
## 7     Grace        IT 85 84 86 85.00000
## 8      Hank        IT 87 85 88 86.66667
## 9       Ivy     Sales 80 78 81 79.66667
## 10     Jack     Sales 85 86 87 86.00000
## 11    Kelly     Sales 88 87 90 88.33333
## 12     Liam     Sales 82 83 84 83.00000
```

```r
# Average performance score per department
average_per_department <- aggregate(employee_data$Average, by = list(employee_data$Department), FUN = me
colnames(average_per_department) <- c("Department", "Average_Score")
average_per_department
```

```
##    Department Average_Score
## 1          HR      85.50000
## 2          IT      88.83333
## 3       Sales      84.25000
```

```r
# Task 6: Add a new employee's performance data to the data frame
new_employee <- data.frame(Employee = "Mona",
                           Department = "Sales",
                           Q1 = 83,
                           Q2 = 85,
                           Q3 = 87,
                           Average = mean(c(83, 85, 87)))  # Calculate average score for the new employ

# Combine the new employee data with the existing employee data
employee_data <- rbind(employee_data, new_employee)
employee_data
```

```
##      Employee Department Q1 Q2 Q3  Average
## 1      Alice         HR 85 82 84 83.66667
## 2        Bob         HR 93 89 87 89.66667
## 3    Charlie         HR 90 91 92 91.00000
## 4      David         HR 75 80 78 77.66667
## 5        Eve         IT 95 93 94 94.00000
## 6      Frank         IT 92 88 89 89.66667
## 7      Grace         IT 85 84 86 85.00000
## 8       Hank         IT 87 85 88 86.66667
## 9        Ivy      Sales 80 78 81 79.66667
## 10      Jack      Sales 85 86 87 86.00000
## 11     Kelly      Sales 88 87 90 88.33333
## 12      Liam      Sales 82 83 84 83.00000
## 13      Mona      Sales 83 85 87 85.00000
```

```r
# Task 7: Organize vectors, matrix, data frame, and calculations into a list
employee_performance_list <- list(Names = employee_names,
                                  Departments = departments,
                                  Performance_Matrix = performance_matrix,
```

```
                                 Employee_Data_Frame = employee_data,
                                 Avg_Per_Department = average_per_department)

employee_performance_list
```

```
## $Names
##  [1] "Alice"   "Bob"     "Charlie" "David"   "Eve"     "Frank"   "Grace"
##  [8] "Hank"    "Ivy"     "Jack"    "Kelly"   "Liam"
##
## $Departments
##  [1] "HR"    "HR"    "HR"    "HR"    "IT"    "IT"    "IT"    "IT"    "Sales"
## [10] "Sales" "Sales" "Sales"
##
## $Performance_Matrix
##         Q1_scores Q2_scores Q3_scores
## Alice          85        82        84
## Bob            93        89        87
## Charlie        90        91        92
## David          75        80        78
## Eve            95        93        94
## Frank          92        88        89
## Grace          85        84        86
## Hank           87        85        88
## Ivy            80        78        81
## Jack           85        86        87
## Kelly          88        87        90
## Liam           82        83        84
##
## $Employee_Data_Frame
##    Employee Department Q1 Q2 Q3  Average
## 1     Alice         HR 85 82 84 83.66667
## 2       Bob         HR 93 89 87 89.66667
## 3   Charlie         HR 90 91 92 91.00000
## 4     David         HR 75 80 78 77.66667
## 5       Eve         IT 95 93 94 94.00000
## 6     Frank         IT 92 88 89 89.66667
## 7     Grace         IT 85 84 86 85.00000
## 8      Hank         IT 87 85 88 86.66667
## 9       Ivy      Sales 80 78 81 79.66667
## 10     Jack      Sales 85 86 87 86.00000
## 11    Kelly      Sales 88 87 90 88.33333
## 12     Liam      Sales 82 83 84 83.00000
## 13     Mona      Sales 83 85 87 85.00000
##
## $Avg_Per_Department
##   Department Average_Score
## 1         HR      85.50000
## 2         IT      88.83333
## 3      Sales      84.25000
```

```r
# Task 8: Delete the performance data for one employee from the matrix and the data frame
# Let's remove "David"
performance_matrix <- performance_matrix[!rownames(performance_matrix) %in% "David", ]
```

```
employee_data <- employee_data[employee_data$Employee != "David", ]

performance_matrix
```

```
##         Q1_scores Q2_scores Q3_scores
## Alice          85        82        84
## Bob            93        89        87
## Charlie        90        91        92
## Eve            95        93        94
## Frank          92        88        89
## Grace          85        84        86
## Hank           87        85        88
## Ivy            80        78        81
## Jack           85        86        87
## Kelly          88        87        90
## Liam           82        83        84
```

```
employee_data
```

```
##    Employee Department Q1 Q2 Q3  Average
## 1     Alice         HR 85 82 84 83.66667
## 2       Bob         HR 93 89 87 89.66667
## 3   Charlie         HR 90 91 92 91.00000
## 5       Eve         IT 95 93 94 94.00000
## 6     Frank         IT 92 88 89 89.66667
## 7     Grace         IT 85 84 86 85.00000
## 8      Hank         IT 87 85 88 86.66667
## 9       Ivy      Sales 80 78 81 79.66667
## 10     Jack      Sales 85 86 87 86.00000
## 11    Kelly      Sales 88 87 90 88.33333
## 12     Liam      Sales 82 83 84 83.00000
## 13     Mona      Sales 83 85 87 85.00000
```