LAB1.R.

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```
# Task 1: Create vectors for employee names, departments, and performance scores
employee_names <- c("Alice", "Bob", "Charlie", "David", "Eve", "Frank", "Grace", "Hank", "Ivy", "Jack",</pre>
departments <- c("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)</pre>
rownames(performance_matrix) <- employee_names</pre>
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
                  88
                             87
                                       90
## Kelly
## Liam
                  82
                             83
                                       84
# Task 3: Convert the matrix into a data frame with department and employee names
employee_data <- data.frame(Employee = employee_names,</pre>
                             Department = departments,
                             Q1 = Q1_scores,
                             Q2 = Q2\_scores,
                             Q3 = Q3\_scores)
employee_data
      Employee Department Q1 Q2 Q3
##
```

1

2

3

4

5

6

Alice

Charlie

David

Frank

Eve

Bob

HR 85 82 84

HR 88 89 87

HR 90 91 92

HR 75 80 78

IT 95 93 94 IT 92 88 89

```
## 7
                       IT 85 84 86
         Grace
                       TT 87 85 88
## 8
          Hank
## 9
                    Sales 80 78 81
           Ivy
## 10
                    Sales 85 86 87
          Jack
## 11
         Kelly
                    Sales 88 87 90
## 12
         Liam
                    Sales 82 83 84
# 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</pre>
employee_data[employee_data$Employee == "Bob", "Q1"] <- employee_data[employee_data$Employee == "Bob",
performance_matrix
           Q1_scores Q2_scores Q3_scores
##
## Alice
                  85
                             82
## Bob
                                       87
                  93
                             89
## Charlie
                  90
                             91
                                       92
## David
                  75
                             80
                                       78
## Eve
                  95
                             93
                                       94
## Frank
                  92
                             88
                                       89
## Grace
                  85
                             84
                                       86
## Hank
                  87
                             85
                                       88
                             78
## Ivy
                  80
                                       81
## Jack
                  85
                             86
                                       87
                  88
                             87
                                       90
## Kelly
                             83
## Liam
                  82
                                       84
employee_data
      Employee Department Q1 Q2 Q3
##
## 1
         Alice
                       HR 85 82 84
## 2
                       HR 93 89 87
           Bob
## 3
                       HR 90 91 92
       Charlie
## 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
                    Sales 80 78 81
## 9
           Ivy
## 10
          Jack
                    Sales 85 86 87
## 11
         Kelly
                    Sales 88 87 90
## 12
         Liam
                    Sales 82 83 84
# 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])</pre>
employee_data
##
      Employee Department Q1 Q2 Q3 Average
## 1
         Alice
                       HR 85 82 84 83.66667
## 2
                       HR 93 89 87 89.66667
```

Bob

```
HR 90 91 92 91.00000
## 3
       Charlie
## 4
         David
                       HR 75 80 78 77.66667
## 5
           Eve
                       IT 95 93 94 94.00000
## 6
                       IT 92 88 89 89.66667
         Frank
## 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
                    Sales 85 86 87 86.00000
         Jack
## 11
         Kelly
                    Sales 88 87 90 88.33333
## 12
         Liam
                    Sales 82 83 84 83.00000
# Average performance score per department
average_per_department <- aggregate(employee_data$Average, by = list(employee_data$Department), FUN = m
colnames(average_per_department) <- c("Department", "Average_Score")</pre>
average_per_department
##
     Department Average_Score
## 1
             HR
                     85.50000
## 2
                     88.83333
             IT
## 3
          Sales
                     84.25000
# Task 6: Add a new employee's performance data to the data frame
new employee <- data.frame(Employee = "Mona",</pre>
                           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)</pre>
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
                       HR 75 80 78 77.66667
         David
## 5
           Eve
                       IT 95 93 94 94.00000
## 6
         Frank
                       IT 92 88 89 89.66667
## 7
                       IT 85 84 86 85.00000
         Grace
## 8
         Hank
                       IT 87 85 88 86.66667
## 9
                    Sales 80 78 81 79.66667
           Ivy
## 10
                    Sales 85 86 87 86.00000
          Jack
## 11
         Kelly
                    Sales 88 87 90 88.33333
## 12
         Liam
                    Sales 82 83 84 83.00000
                    Sales 83 85 87 85.00000
## 13
          Mona
# Task 7: Organize vectors, matrix, data frame, and calculations into a list
```

Departments = departments,

Performance_Matrix = performance_matrix,

employee_performance_list <- list(Names = employee_names,</pre>

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

```
employee_data <- employee_data[employee_data$Employee != "David", ]
performance_matrix</pre>
```

##		Q1_scores	Q2_scores	Q3_scores
##	Alice	85	82	84
##	Bob	93	89	87
##	${\tt Charlie}$	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	QЗ	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