

DBmaps R package Test

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Easy

Load the given data tables

```
library(data.table)

students <- data.table(id = c("A", "B", "C", "D"),
                      Birthdate = c("2001-08-04", "2002-04-28", "2002-06-13", "2002-02-09"))

scores <- data.table(id = c("B", "C", "E"), homework = c(87,94,92), quiz = c(91, 90, 87))
```

- Left Merge

```
# Includes all rows from the first data table and matching rows from the second
left_merge <- merge(students, scores, by = "id", all.x = TRUE)
left_merge
```

```
## Key: <id>
##      id Birthdate homework  quiz
##   <char>   <char>    <num> <num>
## 1:    A 2001-08-04      NA    NA
## 2:    B 2002-04-28      87    91
## 3:    C 2002-06-13      94    90
## 4:    D 2002-02-09      NA    NA
```

- Right Merge

```
# Includes all rows from the second data table and matching rows from the first
right_merge <- merge(students, scores, by = "id", all.y = TRUE)
right_merge
```

```
## Key: <id>
##      id Birthdate homework  quiz
##   <char>   <char>    <num> <num>
## 1:    B 2002-04-28      87    91
## 2:    C 2002-06-13      94    90
## 3:    E      <NA>      92    87
```

- Inner Merge

```
# Includes only rows with matching records in both data tables
inner_merge <- merge(students, scores, by = "id")
inner_merge
```

```
## Key: <id>
##      id Birthdate homework  quiz
##   <char>      <char>      <num> <num>
## 1:      B 2002-04-28         87   91
## 2:      C 2002-06-13         94   90
```

- Outer Merge

```
# Includes all rows in both data tables
right_merge <- merge(students, scores, by = "id", all = TRUE)
right_merge
```

```
## Key: <id>
##      id Birthdate homework  quiz
##   <char>      <char>      <num> <num>
## 1:      A 2001-08-04         NA   NA
## 2:      B 2002-04-28         87   91
## 3:      C 2002-06-13         94   90
## 4:      D 2002-02-09         NA   NA
## 5:      E          <NA>         92   87
```

Medium

```
# Create a function to merge 2 tables and then merge the third one to the combined table
merge_tables <- function(x, y, z,
                        key_xy,
                        key_z,
                        join_type_xy = "inner",
                        join_type_combined_z = "inner") {

  # Create a helper function to prompt merge type
  merge_type <- function(join_type) {
    switch(join_type,
      "inner" = list(all.x = FALSE, all.y = FALSE),
      "outer" = list(all.x = TRUE, all.y = TRUE),
      "left" = list(all.x = TRUE, all.y = FALSE),
      "right" = list(all.x = FALSE, all.y = TRUE),
      stop("Invalid join type. Choose from 'inner', 'outer', 'left', or 'right'.")
    )
  }

  # Merge table x and y
  type_xy <- merge_type(join_type_xy)
  combined_xy <- merge(x, y,
                      by = key_xy,
```

```

        all.x = type_xy$all.x,
        all.y = type_xy$all.y)

# Merge the resulting table with table z
type_combined_z <- merge_type(join_type_combined_z)
final_table <- merge(combined_xy, z,
                     by = key_z,
                     all.x = type_combined_z$all.x,
                     all.y = type_combined_z$all.y)

# Return the final merged table
return(final_table)
}

# Testing

# Create a third data table
subjects <- data.table(id = c("A", "D", "E"), courseid = c(123,456,789))

# Test out the function
student_table <- merge_tables(
  students, scores, subjects,
  key_xy = "id",
  key_z = "id",
  join_type_xy = "left",
  join_type_combined_z = "left"
)
student_table

```

```
## Key: <id>
##      id Birthdate homework  quiz courseid
##   <char>   <char>   <num> <num>   <num>
## 1:    A 2001-08-04      NA    NA      123
## 2:    B 2002-04-28      87    91       NA
## 3:    C 2002-06-13      94    90       NA
## 4:    D 2002-02-09      NA    NA      456

```