HairEyeColor

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```
## WHAT IS THE FREQUENCY OF EYE COLOR BY GENDER?

# Create contingency tables of eye color by gender
eye_color_male <- HairEyeColor[, , "Male"]
eye_color_female <- HairEyeColor[, , "Female"]

# Display the contingency tables
print("Contingency Table for Males:")
```

```
## [1] "Contingency Table for Males:"
```

```
print(eye_color_male)
```

```
##        Eye
## Hair    Brown Blue Hazel Green
##   Black    32   11    10     3
##   Brown    53   50    25    15
##   Red      10   10     7     7
##   Blond     3   30     5     8
```

```
print("Contingency Table for Females:")
```

```
## [1] "Contingency Table for Females:"
```

```
print(eye_color_female)
```

```
##        Eye
## Hair    Brown Blue Hazel Green
##   Black    36    9     5     2
##   Brown    66   34    29    14
##   Red      16    7     7     7
##   Blond     4   64     5     8
```

```
## WHAT IS THE FREQUENCY OF EYE COLOR DISTRIBUTION?

# Sum up the counts of each eye color across all hair colors and genders
eye_color_distribution <- apply(HairEyeColor, 2, sum)


# Display the distribution of eye colors
print(eye_color_distribution)
```

```
## Brown  Blue Hazel Green
##   220   215    93    64
```

```r
## HOW DOES DISTRIBUTION OF HAIR COLOR VARY BY GENDER?

# Access count for Black hair, Brown eyes, Male
black_brown_male_count <- HairEyeColor["Black", "Brown", "Male"]

# Access counts for Brown hair, Blue eyes, Female
brown_blue_female_count <- HairEyeColor["Brown", "Blue", "Female"]

# Access counts for all hair colors, all eye colors, Female
female_counts <- HairEyeColor[, , "Female"]

# Print the counts
print(black_brown_male_count)
```

```
## [1] 32
```

```r
print(brown_blue_female_count)
```

```
## [1] 34
```

```r
print(female_counts)
```

```
##        Eye
## Hair    Brown Blue Hazel Green
##   Black    36    9     5     2
##   Brown    66   34    29    14
##   Red      16    7     7     7
##   Blond     4   64     5     8
```

```r
## WHAT IS THE RELATIONSHIP BETWEEN HAIR AND EYE COLOR?

# Create a contingency table of hair color by eye color
hair_eye_table <- HairEyeColor[, , "Male"] + HairEyeColor[, , "Female"]

# Display the contingency table
print(hair_eye_table)
```

```
##        Eye
## Hair    Brown Blue Hazel Green
##   Black    68   20    15     5
##   Brown   119   84    54    29
##   Red      26   17    14    14
##   Blond     7   94    10    16
```

```r
# Perform a chi-square test of independence
chi_square_test <- chisq.test(hair_eye_table)
print(chi_square_test)
```

```
##
##  Pearson's Chi-squared test
##
## data:  hair_eye_table
## X-squared = 138.29, df = 9, p-value < 2.2e-16
```