Source

Console | Background Jobs

R 4.5.2 · C:/TANVI KHAIR/

```
> library(tidyr)
>
> df <- read.csv("Processed_Titanic_Data.csv", na.strings = c("", "NA"))
>
> df_clean <- df %>%
+   mutate(
+     age = replace_na(age, 0),
+     fare = replace_na(fare, 0),
+     survived = replace_na(survived, 0)
+   )
>
> print("--- Cleaned Baseline Data ---")
[1] "--- Cleaned Baseline Data ---"
> print(head(df_clean))
  primary_id survived pclass                                          name    sex age sibsp parch        ticket    fare   cabin embarked sex_code embarked_code
1          1        0      3                       Braund, Mr. Owen Harris   male  22     1     0     A/5 21171  7.2500 Unknown        S        1             2
2          2        1      1 Cumings, Mrs. John Bradley (Florence Briggs Thayer) female  38     1     0      PC 17599 71.2833     C85        C        0             0
3          3        1      3                        Heikkinen, Miss. Laina female  26     0     0 STON/O2. 3101282  7.9250 Unknown        S        0             2
4          4        1      1  Futrelle, Mrs. Jacques Heath (Lily May Peel) female  35     1     0        113803 53.1000    C123        S        0             2
5          5        0      3                      Allen, Mr. William Henry   male  35     0     0        373450  8.0500 Unknown        S        1             2
6          6        0      3                              Moran, Mr. James   male   0     0     0        330877  8.4583 Unknown        Q        1             1
  ticket_code cabin_code name_code
1         523        147       108
2         596         81       190
3         669        147       353
4          49         55       272
5         472        147        15
6         275        147       554
>
> df_calc <- df_clean %>%
+   mutate(
+     Fare_Tax = fare * 0.10,
+     Final_Fare = fare + Fare_Tax
+   )
>
> print("--- Method A: Arithmetic Results ---")
[1] "--- Method A: Arithmetic Results ---"
> print(df_calc %>% select(fare, Fare_Tax, Final_Fare))
      fare Fare_Tax Final_Fare
1   7.2500  0.72500    7.97500
2  71.2833  7.12833   78.41163
3   7.9250  0.79250    8.71750
4  53.1000  5.31000   58.41000
5   8.0500  0.80500    8.85500
6   8.4583  0.84583    9.30413
```

Source

Console | Background Jobs

R 4.5.2 · C:/TANVI KHAIR/

```
6    8.4583  0.84583    9.30413
7   51.8625  5.18625   57.04875
8   21.0750  2.10750   23.18250
9   11.1333  1.11333   12.24663
10  30.0708  3.00708   33.07788
11  16.7000  1.67000   18.37000
12  26.5500  2.65500   29.20500
13   8.0500  0.80500    8.85500
14  31.2750  3.12750   34.40250
15   7.8542  0.78542    8.63962
16  16.0000  1.60000   17.60000
17  29.1250  2.91250   32.03750
18  13.0000  1.30000   14.30000
19  18.0000  1.80000   19.80000
20   7.2250  0.72250    7.94750
21  26.0000  2.60000   28.60000
22  13.0000  1.30000   14.30000
23   8.0292  0.80292    8.83212
24  35.5000  3.55000   39.05000
25  21.0750  2.10750   23.18250
26  31.3875  3.13875   34.52625
27   7.2250  0.72250    7.94750
28 263.0000 26.30000  289.30000
29   7.8792  0.78792    8.66712
30   7.8958  0.78958    8.68538
31  27.7208  2.77208   30.49288
32 146.5208 14.65208  161.17288
33   7.7500  0.77500    8.52500
34  10.5000  1.05000   11.55000
35  82.1708  8.21708   90.38788
36  52.0000  5.20000   57.20000
37   7.2292  0.72292    7.95212
38   8.0500  0.80500    8.85500
39  18.0000  1.80000   19.80000
40  11.2417  1.12417   12.36587
41   9.4750  0.94750   10.42250
42  21.0000  2.10000   23.10000
43   7.8958  0.78958    8.68538
44  41.5792  4.15792   45.73712
45   7.8792  0.78792    8.66712
46   8.0500  0.80500    8.85500
47  15.5000  1.55000   17.05000
48   7.7500  0.77500    8.52500
49  21.6792  2.16792   23.84712
50  17.8000  1.78000   19.58000
```

Name-Tanvi Khair   roll no-S087

```
49    21.6792   2.16792    23.84712
50    17.8000   1.78000    19.58000
51    39.6875   3.96875    43.65625
52     7.8000   0.78000     8.58000
53    76.7292   7.67292    84.40212
54    26.0000   2.60000    28.60000
55    61.9792   6.19792    68.17712
56    35.5000   3.55000    39.05000
57    10.5000   1.05000    11.55000
58     7.2292   0.72292     7.95212
59    27.7500   2.77500    30.52500
60    46.9000   4.69000    51.59000
61     7.2292   0.72292     7.95212
62    80.0000   8.00000    88.00000
63    83.4750   8.34750    91.82250
64    27.9000   2.79000    30.69000
65    27.7208   2.77208    30.49288
66    15.2458   1.52458    16.77038
67    10.5000   1.05000    11.55000
68     8.1583   0.81583     8.97413
69     7.9250   0.79250     8.71750
70     8.6625   0.86625     9.52875
71    10.5000   1.05000    11.55000
72    46.9000   4.69000    51.59000
73    73.5000   7.35000    80.85000
74    14.4542   1.44542    15.89962
75    56.4958   5.64958    62.14538
76     7.6500   0.76500     8.41500
77     7.8958   0.78958     8.68538
78     8.0500   0.80500     8.85500
79    29.0000   2.90000    31.90000
80    12.4750   1.24750    13.72250
81     9.0000   0.90000     9.90000
82     9.5000   0.95000    10.45000
83     7.7875   0.77875     8.56625
84    47.1000   4.71000    51.81000
85    10.5000   1.05000    11.55000
86    15.8500   1.58500    17.43500
87    34.3750   3.43750    37.81250
88     8.0500   0.80500     8.85500
89   263.0000  26.30000   289.30000
90     8.0500   0.80500     8.85500
91     8.0500   0.80500     8.85500
92     7.8542   0.78542     8.63962
93    61.1750   6.11750    67.29250
```

```
327    0.2575   0.02575     0.86123
328   13.0000   1.30000    14.30000
329   20.5250   2.05250    22.57750
330   57.9792   5.79792    63.77712
331   23.2500   2.32500    25.57500
332   28.5000   2.85000    31.35000
333  153.4625  15.34625   168.80875
 [ reached 'max' / getOption("max.print") -- omitted 558 rows ]
>
> df_logic <- df_clean %>%
+   mutate(
+     Age_Group = ifelse(age > 18, "Adult", "Minor"),
+     Survival_Status = ifelse(survived == 1, "Survived", "Not Survived")
+   )
>
> print("--- Method B: Logic Results ---")
[1] "--- Method B: Logic Results ---"
> print(df_logic %>% select(age, Age_Group, survived, Survival_Status))
      age Age_Group survived Survival_Status
1   22.00     Adult        0    Not Survived
2   38.00     Adult        1        Survived
3   26.00     Adult        1        Survived
4   35.00     Adult        1        Survived
5   35.00     Adult        0    Not Survived
6    0.00     Minor        0    Not Survived
7   54.00     Adult        0    Not Survived
8    2.00     Minor        0    Not Survived
9   27.00     Adult        1        Survived
10  14.00     Minor        1        Survived
11   4.00     Minor        1        Survived
12  58.00     Adult        1        Survived
13  20.00     Adult        0    Not Survived
14  39.00     Adult        0    Not Survived
15  14.00     Minor        0    Not Survived
16  55.00     Adult        1        Survived
17   2.00     Minor        0    Not Survived
18   0.00     Minor        1        Survived
19  31.00     Adult        0    Not Survived
20   0.00     Minor        1        Survived
21  35.00     Adult        0    Not Survived
22  34.00     Adult        1        Survived
23  15.00     Minor        1        Survived
24  28.00     Adult        1        Survived
25   8.00     Minor        0    Not Survived
26  38.00     Adult        1        Survived
27   0.00     Minor        0    Not Survived
```

Name-Tanvi Khair   roll no-S087

File Edit Code View Plots Session Build Debug Profile Tools Help

Source

Console   Background Jobs

R R 4.5.2 · C:/TANVI KHAIR/

```
141  0.00   Minor   0   Not Survived
142 22.00   Adult   1       Survived
143 24.00   Adult   1       Survived
144 19.00   Adult   0   Not Survived
145 18.00   Minor   0   Not Survived
146 19.00   Adult   0   Not Survived
147 27.00   Adult   1       Survived
148  9.00   Minor   0   Not Survived
149 36.50   Adult   0   Not Survived
150 42.00   Adult   0   Not Survived
151 51.00   Adult   0   Not Survived
152 22.00   Adult   1       Survived
153 55.50   Adult   0   Not Survived
154 40.50   Adult   0   Not Survived
155  0.00   Minor   0   Not Survived
156 51.00   Adult   0   Not Survived
157 16.00   Minor   1       Survived
158 30.00   Adult   0   Not Survived
159  0.00   Minor   0   Not Survived
160  0.00   Minor   0   Not Survived
161 44.00   Adult   0   Not Survived
162 40.00   Adult   1       Survived
163 26.00   Adult   0   Not Survived
164 17.00   Minor   0   Not Survived
165  1.00   Minor   0   Not Survived
166  9.00   Minor   1       Survived
167  0.00   Minor   1       Survived
168 45.00   Adult   0   Not Survived
169  0.00   Minor   0   Not Survived
170 28.00   Adult   0   Not Survived
171 61.00   Adult   0   Not Survived
172  4.00   Minor   0   Not Survived
173  1.00   Minor   1       Survived
174 21.00   Adult   0   Not Survived
175 56.00   Adult   0   Not Survived
176 18.00   Minor   0   Not Survived
177  0.00   Minor   0   Not Survived
178 50.00   Adult   0   Not Survived
179 30.00   Adult   0   Not Survived
180 36.00   Adult   0   Not Survived
181  0.00   Minor   0   Not Survived
182  0.00   Minor   0   Not Survived
183  9.00   Minor   0   Not Survived
184  1.00   Minor   1       Survived
185  4.00   Minor   1       Survived
```

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Source

Console   Background Jobs

R R 4.5.2 · C:/TANVI KHAIR/

```
248 24.00    Adult    1       Survived
249 37.00    Adult    1       Survived
250 54.00    Adult    0   Not Survived
 [ reached 'max' / getOption("max.print") -- omitted 641 rows ]
>
> df_text <- df_clean %>%
+   mutate(
+     Passenger_Summary = paste(name, "paid", fare, "and traveled in class", pclass)
+   )
>
> print("--- Method C: Text Transformation ---")
[1] "--- Method C: Text Transformation ---"
> print(head(df_text$Passenger_Summary))
[1] "Braund, Mr. Owen Harris paid 7.25 and traveled in class 3"
[2] "Cumings, Mrs. John Bradley (Florence Briggs Thayer) paid 71.2833 and traveled in class 1"
[3] "Heikkinen, Miss. Laina paid 7.925 and traveled in class 3"
[4] "Futrelle, Mrs. Jacques Heath (Lily May Peel) paid 53.1 and traveled in class 1"
[5] "Allen, Mr. William Henry paid 8.05 and traveled in class 3"
[6] "Moran, Mr. James paid 8.4583 and traveled in class 3"
>
> final_dataset <- df_clean %>%
+   mutate(
+     Final_Fare = fare + (fare * 0.10),
+     High_Fare = ifelse(Final_Fare > 50, TRUE, FALSE),
+     Status_Report = paste0("Age: ", age, " | Survived: ", survived)
+   )
>
> print("--- Final Combined Dataset ---")
[1] "--- Final Combined Dataset ---"
> print(head(final_dataset))
  primary_id survived pclass                                              name    sex age sibsp parch       ticket    fare   cabin embarked sex_code embarked_code
1          1        0      3                           Braund, Mr. Owen Harris   male  22     1     0    A/5 21171  7.2500 Unknown        S        1             2
2          2        1      1 Cumings, Mrs. John Bradley (Florence Briggs Thayer) female  38     1     0     PC 17599 71.2833     C85        C        0             0
3          3        1      3                            Heikkinen, Miss. Laina female  26     0     0 STON/O2. 3101282  7.9250 Unknown        S        0             2
4          4        1      1      Futrelle, Mrs. Jacques Heath (Lily May Peel) female  35     1     0       113803 53.1000    C123        S        0             0
5          5        0      3                          Allen, Mr. William Henry   male  35     0     0       373450  8.0500 Unknown        S        1             2
6          6        0      3                                  Moran, Mr. James   male   0     0     0       330877  8.4583 Unknown        Q        1             1
  ticket_code cabin_code name_code Final_Fare High_Fare      Status_Report
1         523        147       108    7.97500     FALSE Age: 22 | Survived: 0
2         596         81       190   78.41163      TRUE Age: 38 | Survived: 1
3         669        147       353    8.71750     FALSE Age: 26 | Survived: 1
4          49         55       272   58.41000      TRUE Age: 35 | Survived: 1
5         472        147        15    8.85500     FALSE Age: 35 | Survived: 0
6         275        147       554    9.30413     FALSE Age: 0 | Survived: 0
>
```

Name-Tanvi Khair   roll no-S087