STUDENT ALCOHOL CONSUMPTION

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PROJECT GOALS

1. Study patterns of daily and weekly alcohol consumption levels among students.

2. Recogonise and Study relationship among alcohol consumption and social, familial and academic factors.

3. Analyse and understand potential indicators to identify high consumption levels among students.

DATASET

- Datasets Used -

1. student-mat.csv (Maths Students)
2. student-por.csv (Portuguese language students)

- Total attributes - 33

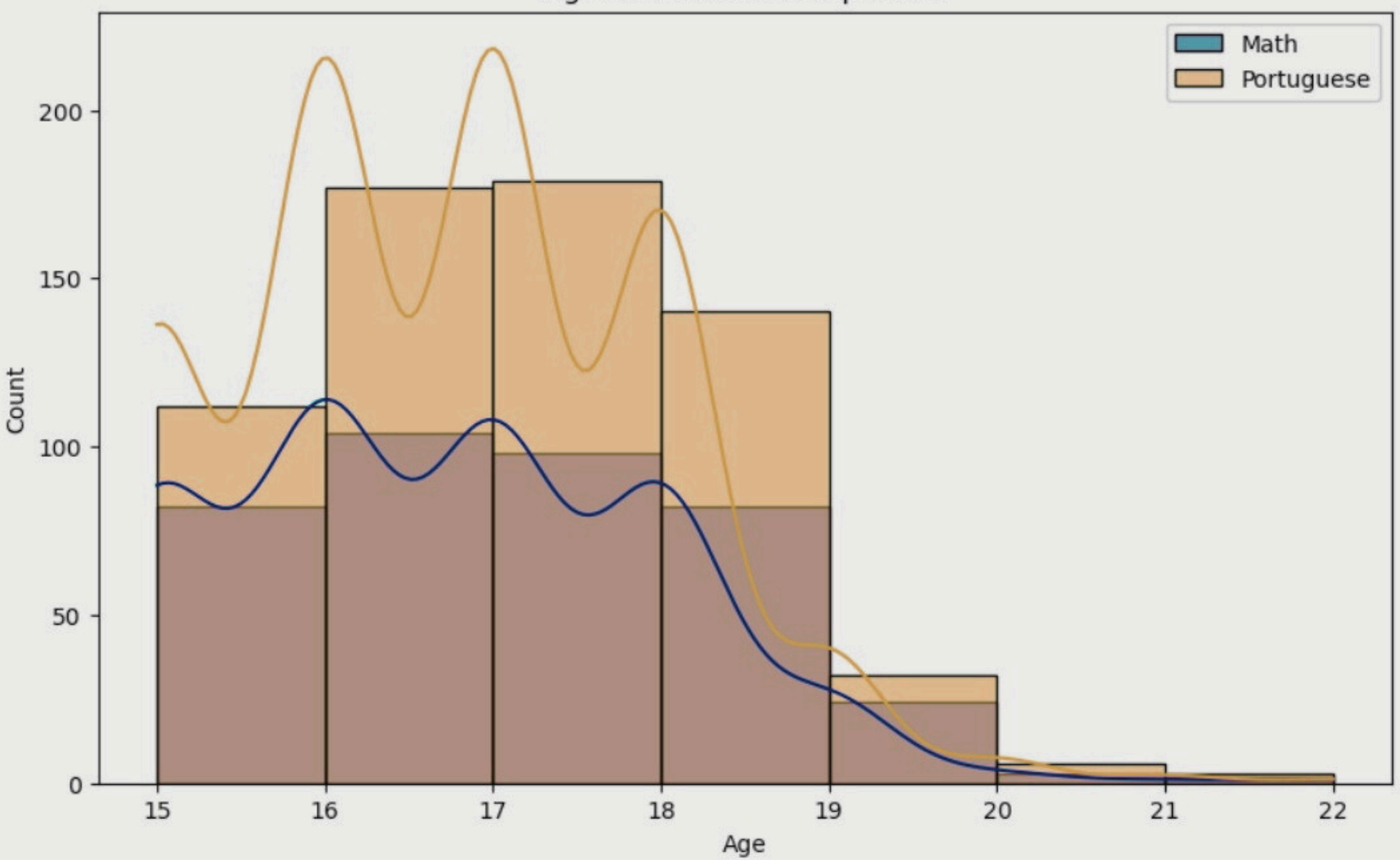
- Key Attributes -

1. Alcohol Consumption Levels (Dalc, Walc)
2. Demographic (age, sex, pstatus, mjob, fjob)
3. Academic Performance (G1, G2, G3)
4. Social (Gout, studytime, romantic, internet)

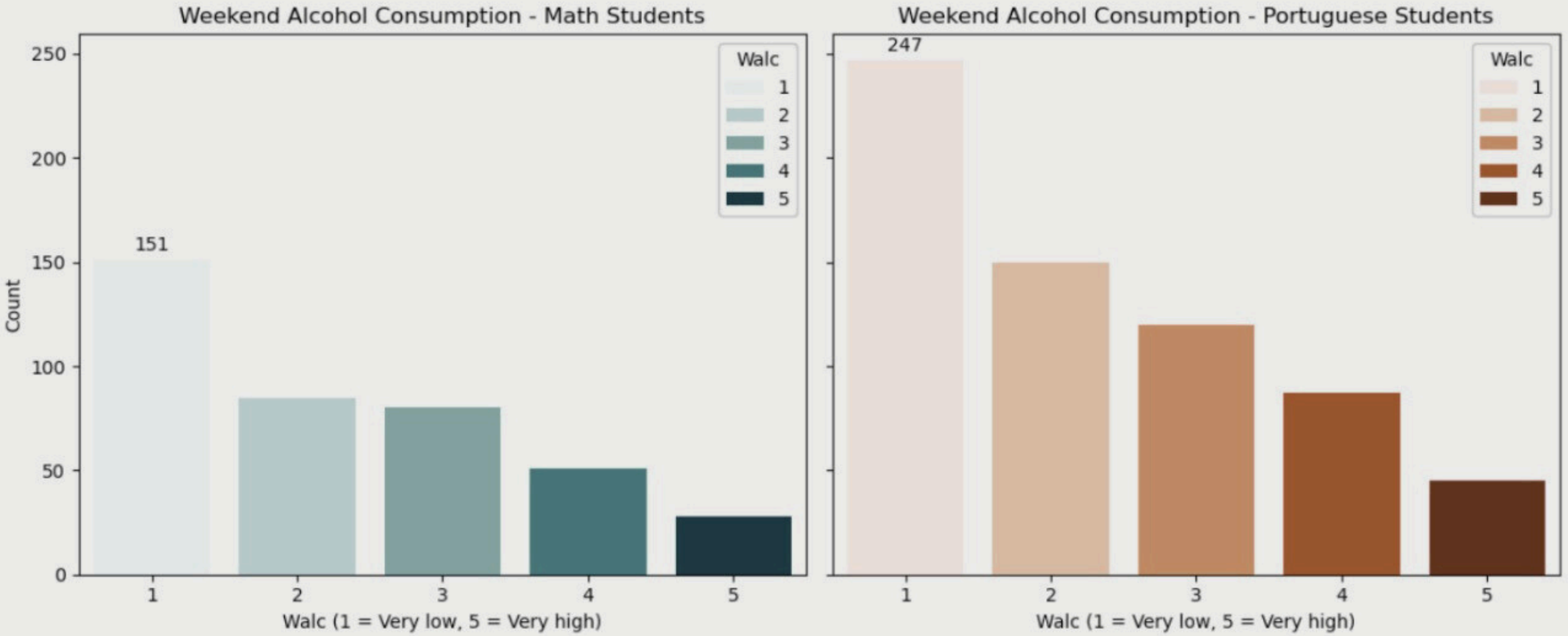
- There were no null and duplicate values in the dataset.

IMPORTANT INSIGHTS

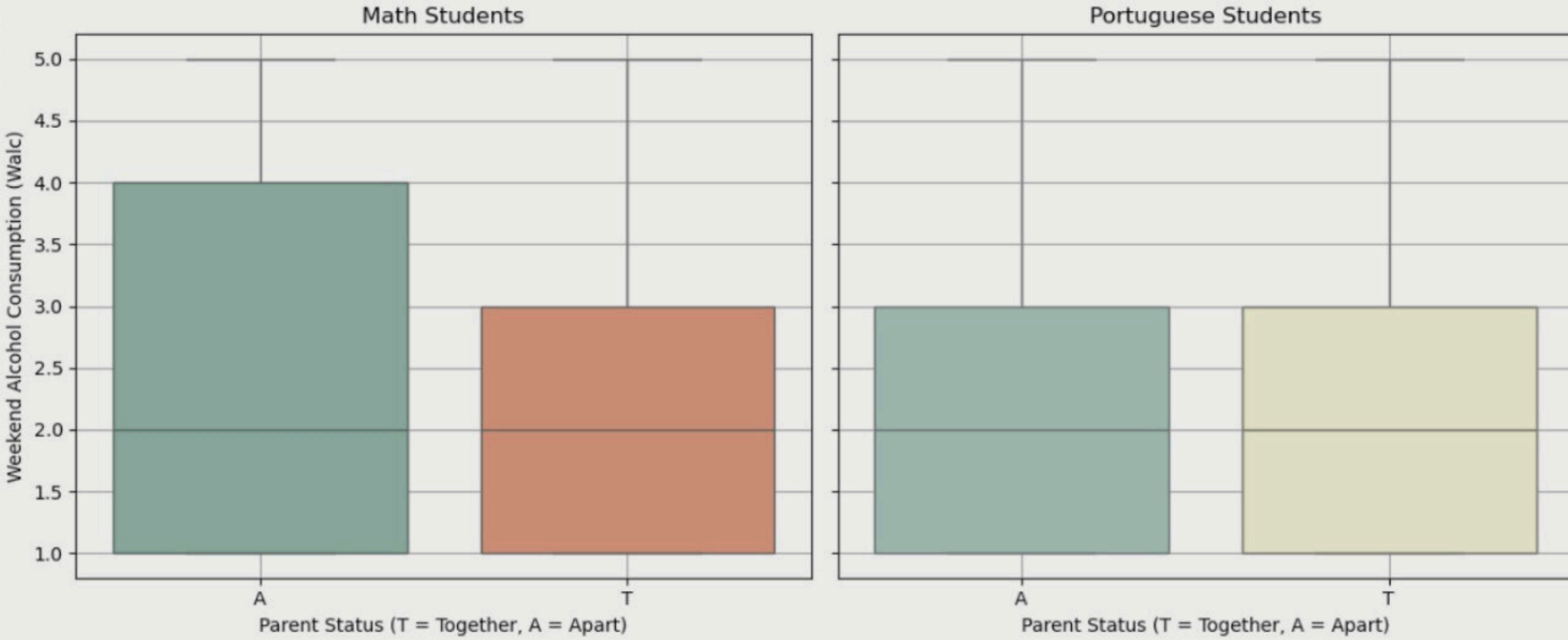
- Univariate
- Bivariate
- MultiVariate



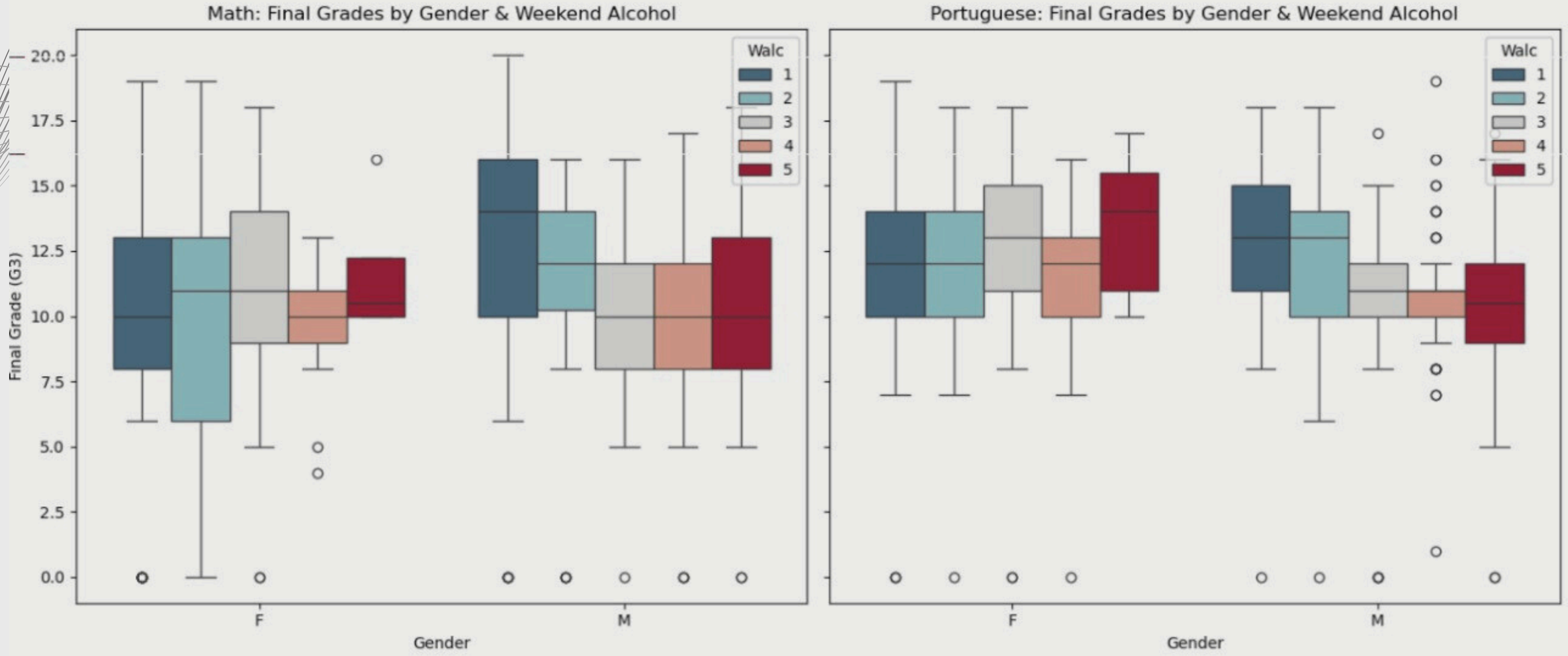
The graph compares the age distribution of students in math and portugese classes. The portugese group depicts a higher concentration in ages 16 -17 while the Maths students distribution is more evenly spread.



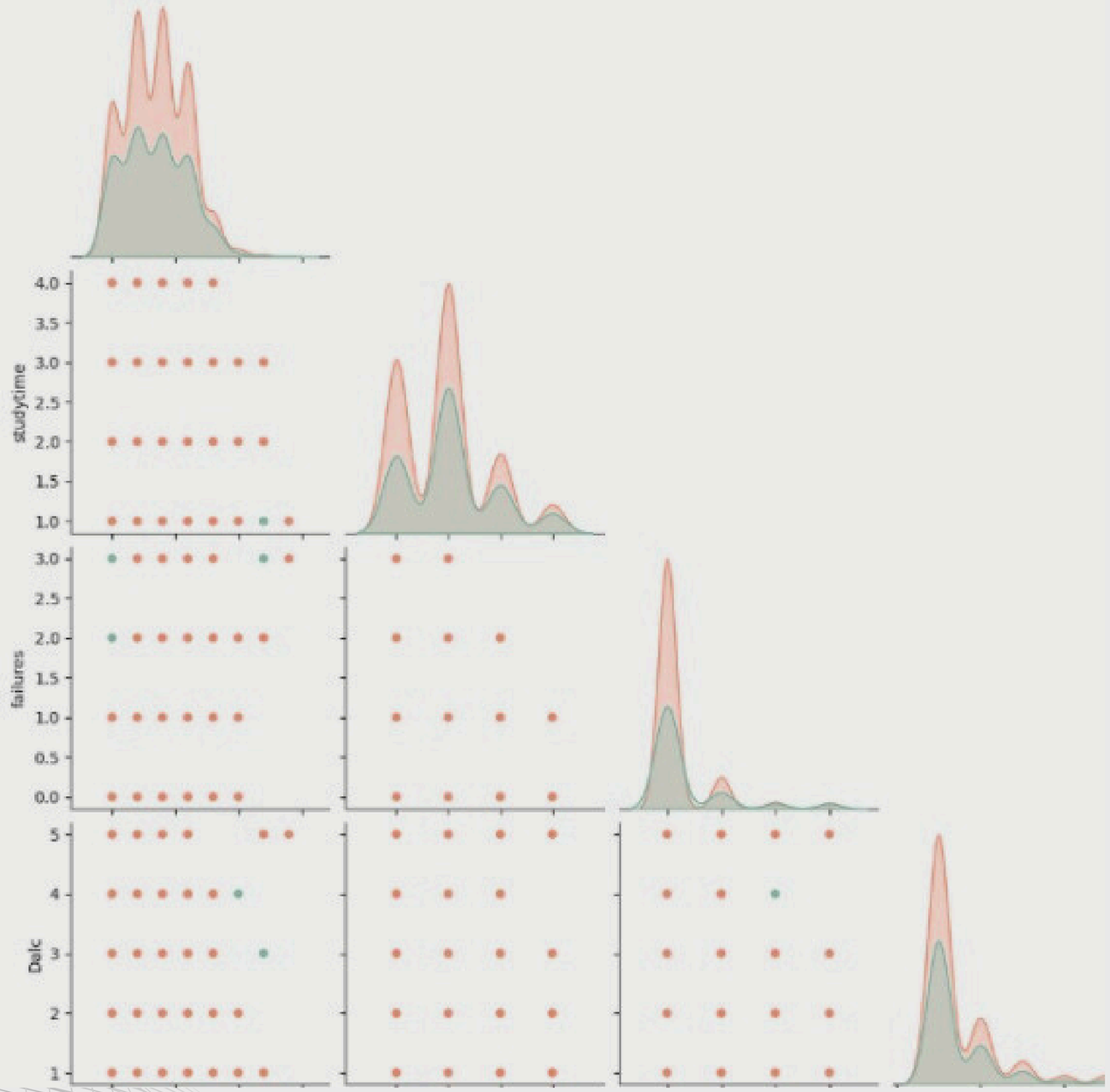
- Both groups report very low weekend alcohol consumption.
- Portugese Students have a more evenly spread distribution which shows more students with moderate to high drinking levels.



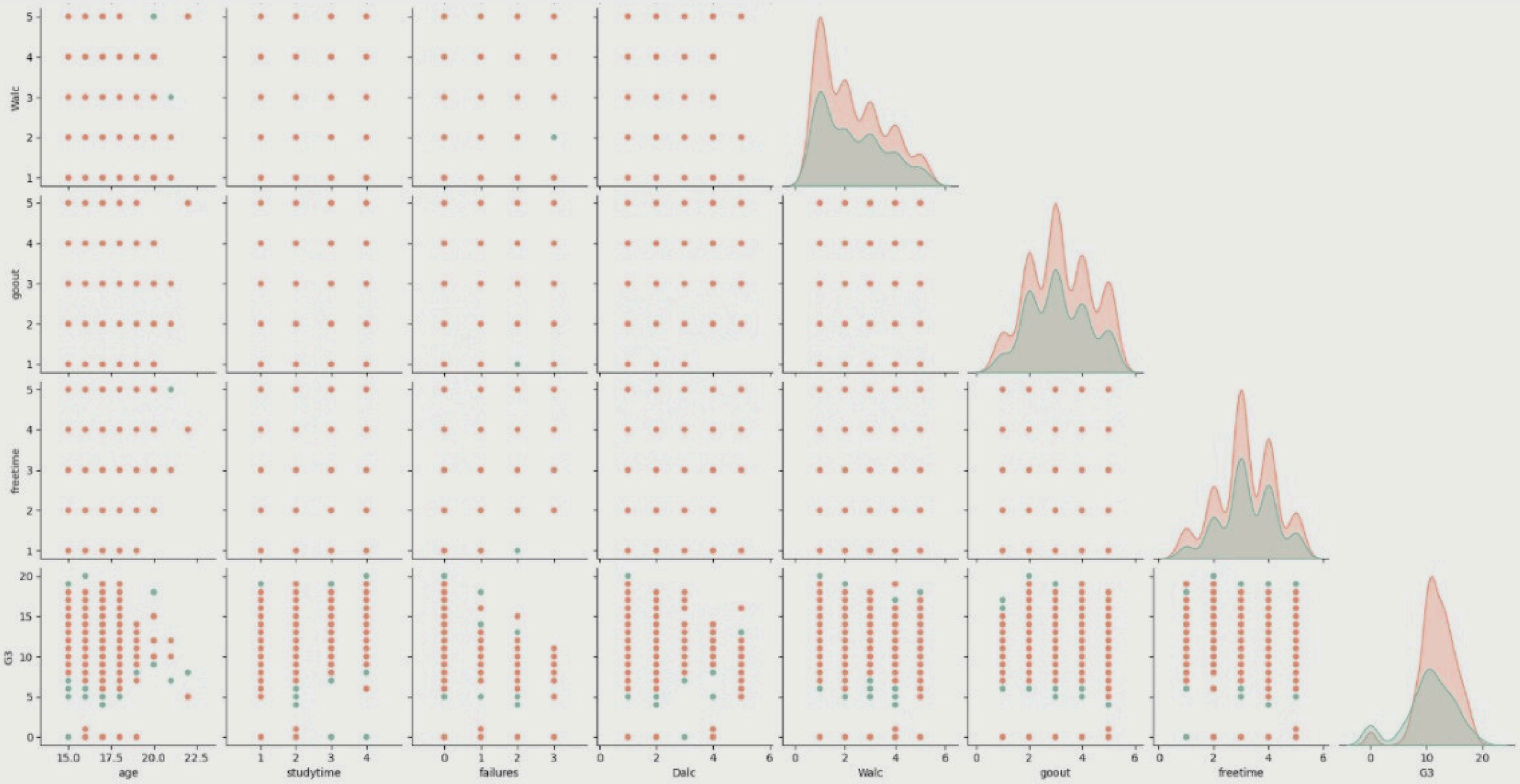
- Math students with separated parents show slightly higher upper-range drinking.
- Among Portuguese students, weekend alcohol consumption appears similar regardless of parental status

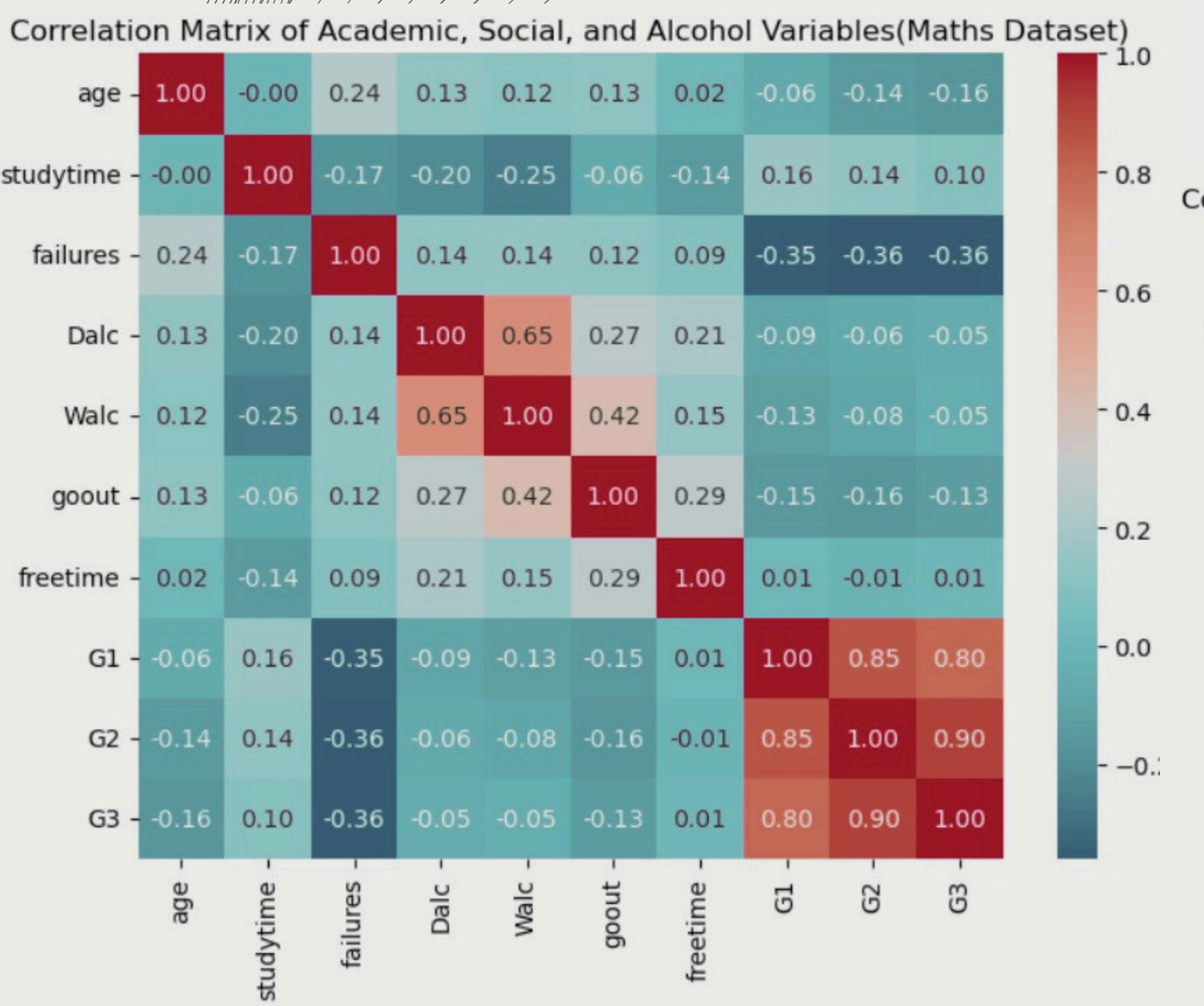


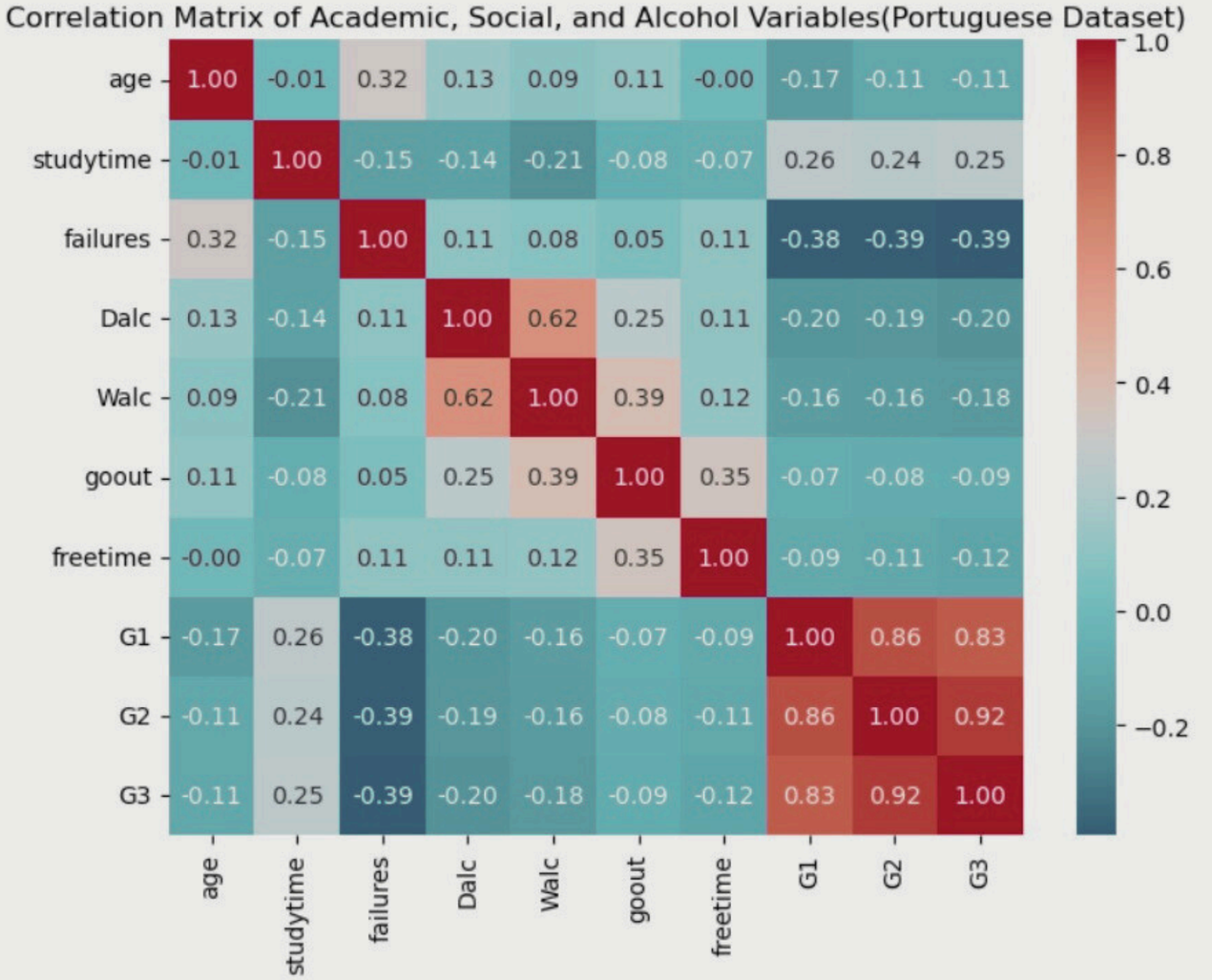
- Students with lower weekend alcohol consumption (Walc=1 or 2) tend to have higher median final grades.
- Both Math and Portuguese students show lower grades with higher weekend drinking.



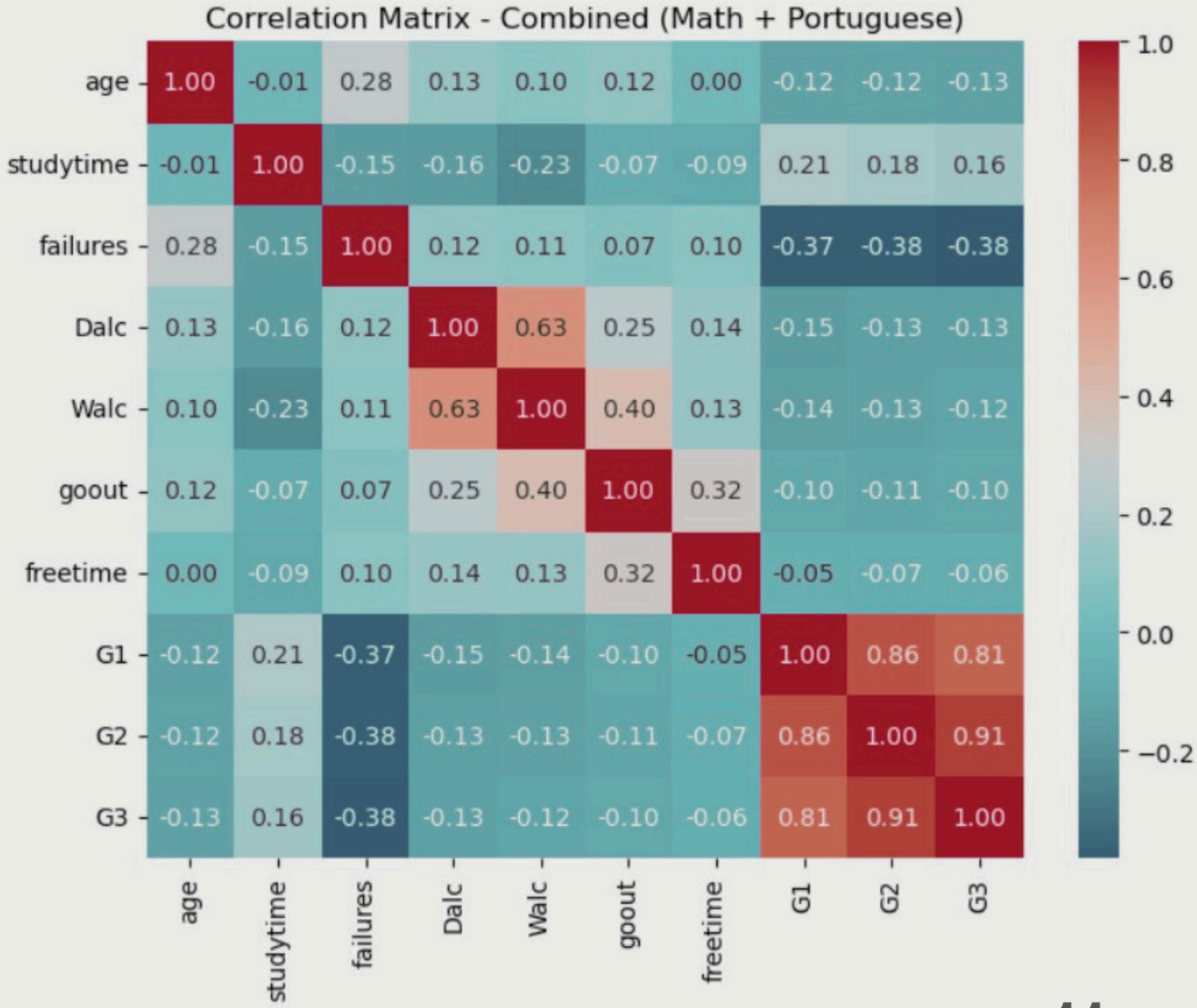
- Compares studytime, failures, and weekday alcohol use.
- Diagonal: Portuguese students tend to have slightly higher studytime levels.
- Scatterplots: Weak positive trend between failures and Dalc suggests higher failures may slightly align with higher alcohol use.


Walc
goout
freetime
G3
age
studytime
failures
Dalc
Walc
goout
freetime
G3


Correlation Matrix of Academic, Social, and Alcohol Variables(Maths Dataset)
age 1.00 -0.00 0.24 0.13 0.12 0.13 0.02 -0.06 -0.14 -0.16
studytime -0.00 1.00 -0.17 -0.20 -0.25 -0.06 -0.14 0.16 0.14 0.10
failures 0.24 -0.17 1.00 0.14 0.14 0.12 0.09 -0.35 -0.36 -0.36
Dalc 0.13 -0.20 0.14 1.00 0.65 0.27 0.21 -0.09 -0.06 -0.05
Walc 0.12 -0.25 0.14 0.65 1.00 0.42 0.15 -0.13 -0.08 -0.05
goout 0.13 -0.06 0.12 0.27 0.42 1.00 0.29 -0.15 -0.16 -0.13
freetime 0.02 -0.14 0.09 0.21 0.15 0.29 1.00 0.01 -0.01 0.01
G1 -0.06 0.16 -0.35 -0.09 -0.13 -0.15 0.01 1.00 0.85 0.80
G2 -0.14 0.14 -0.36 -0.06 -0.08 -0.16 -0.01 0.85 1.00 0.90
G3 -0.16 0.10 -0.36 -0.05 -0.05 -0.13 0.01 0.80 0.90 1.00
age studytime failures Dalc Walc goout freetime G1 G2 G3
1.0 0.8 0.6 0.4 0.2 0.0 −0.


Correlation Matrix of Academic, Social, and Alcohol Variables(Portuguese Dataset)
age 1.00 -0.01 0.32 0.13 0.09 0.11 -0.00 -0.17 -0.11 -0.11
studytime -0.01 1.00 -0.15 -0.14 -0.21 -0.08 -0.07 0.26 0.24 0.25
failures 0.32 -0.15 1.00 0.11 0.08 0.05 0.11 -0.38 -0.39 -0.39
Dalc 0.13 -0.14 0.11 1.00 0.62 0.25 0.11 -0.20 -0.19 -0.20
Walc 0.09 -0.21 0.08 0.62 1.00 0.39 0.12 -0.16 -0.16 -0.18
goout 0.11 -0.08 0.05 0.25 0.39 1.00 0.35 -0.07 -0.08 -0.09
freetime -0.00 -0.07 0.11 0.11 0.12 0.35 1.00 -0.09 -0.11 -0.12
G1 -0.17 0.26 -0.38 -0.20 -0.16 -0.07 -0.09 1.00 0.86 0.83
G2 -0.11 0.24 -0.39 -0.19 -0.16 -0.08 -0.11 0.86 1.00 0.92
G3 -0.11 0.25 -0.39 -0.20 -0.18 -0.09 -0.12 0.83 0.92 1.00
age studytime failures Dalc Walc goout freetime G1 G2 G3
1.0 0.8 0.6 0.4 0.2 0.0 −0.2

- Strong positive correlation between grades
- Daily and weekend alcohol consumption show high correlation rate of 0.63
- Moderate correlation link between going out and weekend drinking(0.40).



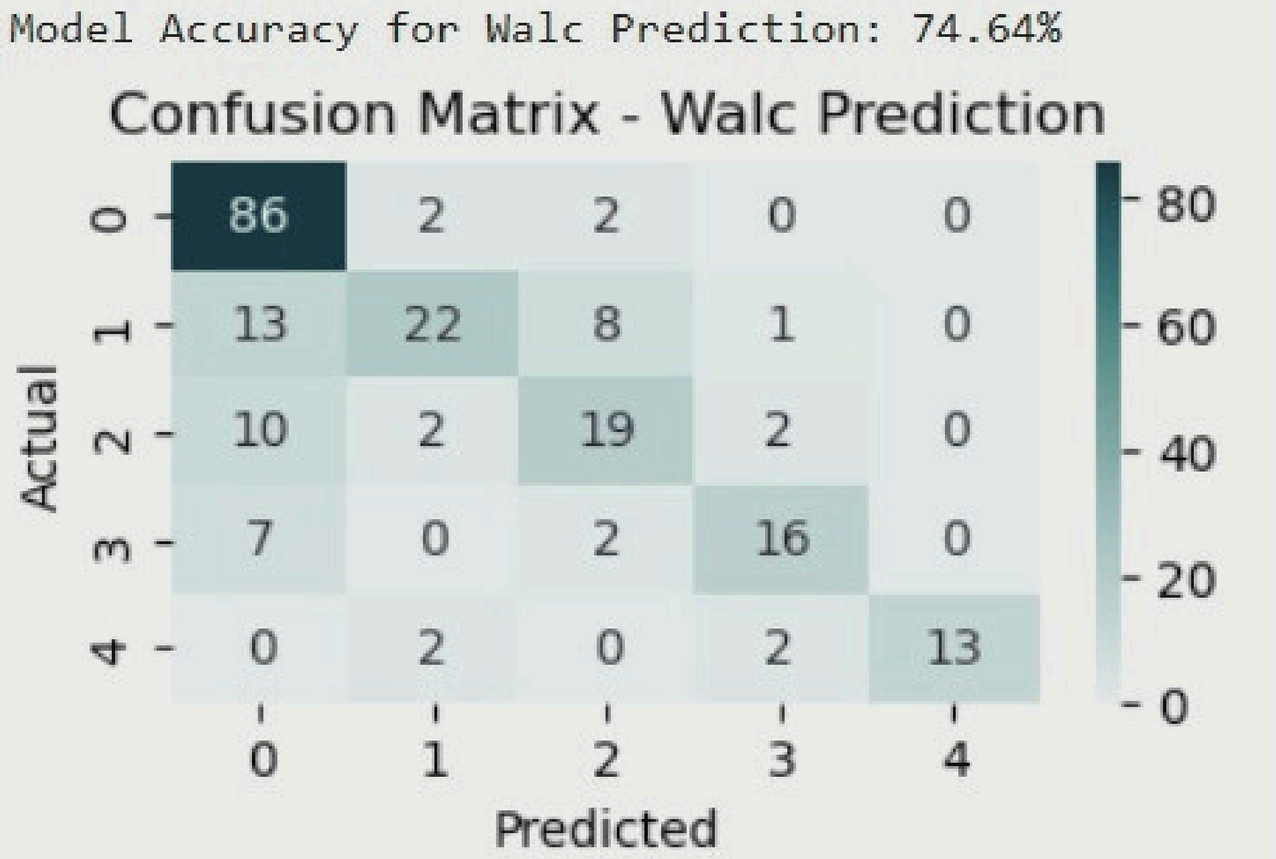
ANALYSIS

- Students mostly aged between 16-18 years, similar patterns in both the classes.
- Weekend alcohol consumption (Walc) is significantly higher than weekday consumption (Dalc).
- Age alone doesn’t strongly affect consumption levels, but older students show slightly higher weekend drinking.
- Family Structure and living status has mild influence on alcohol consumption levels, however it may vary with other factors. Features like ‘famsup’ (family support) and ‘romantic’ (relationship status) often relate to drinking behavior.

ANALYSIS

- Higher weekend drinking may have a negative impact on grades and academic performances.
- Students who spend more time online or have low academic motivation may tend to consume more alcohol.
- Alcohol consumption is dirently linked to social behaviour like going out.

ML MODELS



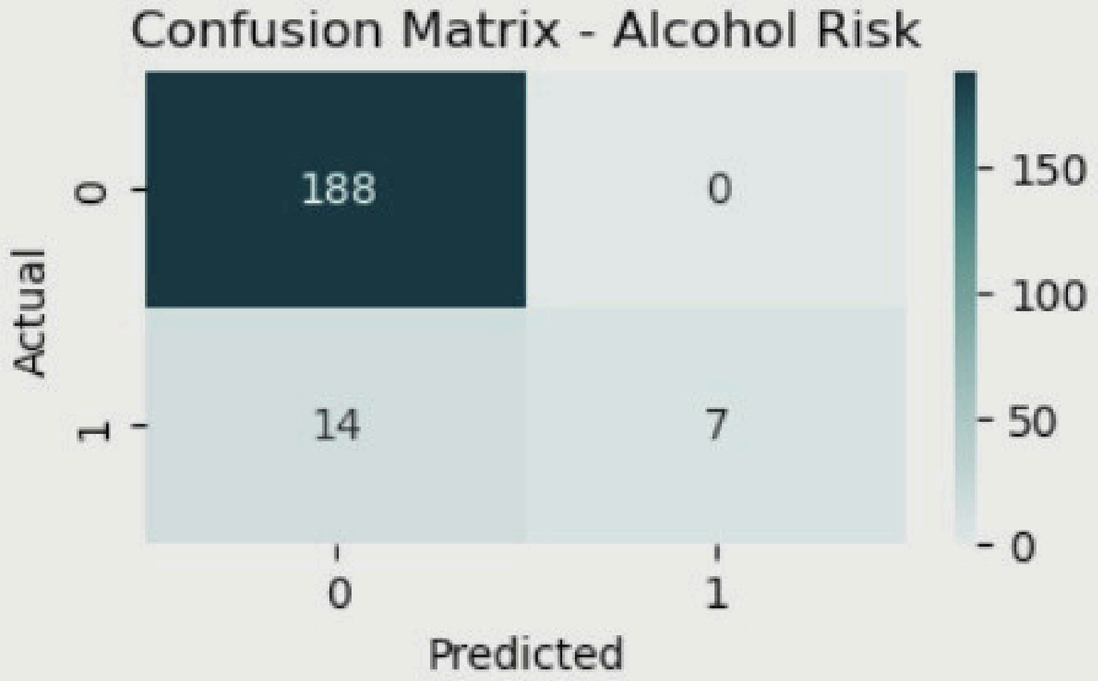
Weekend Alcohol Prediction -

- Accuracy: 74.6%
- Performs best for class 1 and 5 (low & very high drinkers).
- Confusion matrix shows overlapping predictions in mid-range consumption levels

Classification Report for Alcohol Risk Prediction:

	precision	recall	f1-score	support
0	0.93	1.00	0.96	188
1	1.00	0.33	0.50	21
accuracy			0.93	209
macro avg	0.97	0.67	0.73	209
weighted avg	0.94	0.93	0.92	209

Model Accuracy: 93.30%



Alcohol Risk Prediction -

- The model predicts whether a student is at low risk (0) or high risk (1) based on their data
- Accuracy: 93.3%
- Confusion matrix shows 14 high-risk cases misclassified as low risk

THANK YOU