

# W23012876\_Elangovan\_Paramasivam\_Assignment\_KL7012.pdf

by Elangovan PARAMASIVAM

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## **Statistical Programming**

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## QUESTION 1:

The following analysis aims to find whether individuals attending exercise classes were most likely to lose weight or who did gym workout only. The analysis was conducted using the data collected among two groups: the exercise class group with 45 participants and gym only workouts group with 62 participants.

### Descriptive Statistics:

By comparing the given stats gym-only workout had a higher mean weight loss of 2.5 Kg with standard deviation of 1.33 kg compare to exercise-class group and The mode weight loss for exercise class participants was 1.5 kgs, while gym-only participants is 1.7 kgs, Although the mode values are close, it is clear that the gym-only group maintained a slightly higher weight loss but there is a difference in the number of participants, to prove it we need more statistics evidence. In group 1, the mean is close to mode and moderate variability suggests symmetrical distribution, similarly in gym group, mean is higher than mode with moderate variability suggests normal to rightly skewed distribution.

### Statistical Testing:

Based on above data, the participants are different in each group and Standard deviation is different, so Welch t test is used to compare mean of two groups(Laura Lu, 2010), as it can handle difference in sample and variance among groups, suitable for normal distribution of data.

Null hypotheses (H0): The mean weight loss for participants in the exercise-class ( $\mu_1$ ) is equal to the mean weight loss for participants in gym-only workouts ( $\mu_2$ ).

Alternate Hypotheses (H1): The mean weight loss for participants in the exercise-class ( $\mu_1$ ) is less than the mean weight loss for participants in gym-only workouts ( $\mu_2$ ).

```
> mean_class <- 1.8
> sd_class <- 1.03
> n_class <- 45
> mean_gym <- 2.5
> sd_gym <- 1.33
> n_gym <- 62
> set.seed(123)
> data_class <- rnorm(n_class, mean_class, sd_class)
> data_gym <- rnorm(n_gym, mean_gym, sd_gym)
> result <- t.test(data_class, data_gym, var.equal = FALSE)
> print(result)

Welch Two Sample t-test

data: data_class and data_gym
t = -3.3909, df = 102.33, p-value = 0.0009909
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
-1.1086520 -0.2903498
sample estimates:
mean of x mean of y
1.869038 2.568539
```

Welch's Two Sample t-test(West, 2021) was conducted to compare the mean weight loss between the two groups. The t-statistic obtained was -3.066573, with a corresponding p-

value of 0.0099. P value is less than the significant level (0.005), so we can reject null hypothesis.

The negative t-statistic suggests that the mean weight loss in the exercise class group was lower than that in the gym-only workouts group.

#### **Interpretation of T test:**

The T test results indicates a significant difference in mean weight loss between two groups and participant in the gym only workout group experienced higher level of weight loss and difference in mean weight loss was 0.7 Kg (2.5 – 1.8), with 95% confidence interval ranging from -1.1 to -0.29 from t test shows that individuals in gym only lost between 0.29 kg and 1.11 more weight than in exercise class groups.

#### **Conclusion:**

As the null hypotheses is rejected and there is evidence to support alternate hypotheses(H1) that gym-only workouts are more effective in promoting weight loss compared to exercise classes but Factors like duration of workouts, gender, age, lifestyle, diet, and health conditions also influence the effective weight loss. So, including those factors, increasing the samples and analyses the actual data their distribution will help us to accurately narrow down our analysis. To conclude, with the given data it is evident that gym only workouts are effective in losing weight.

#### **QUESTION 2:**

There are several methods for handling missing data like deletion, imputation, expectation maximization (EM). Each method has its own advantages and limitations. The selection depends on nature of data, level of missingness. Enders(2017) found that most common methods is Imputation, where missing values are replaced with any of the mean, median, mode, estimated values or average of nearest value, based on datatype, distribution. When data is numeric and symmetric distribution mean imputation is used(Heymans and Twisk, 2022), if it is having skewed distribution with outlier median is best for imputation. For categorical data Mode is common imputation method. When missed value is dependent of another feature then prediction using regression is suitable. When there is uncertainty, multiple imputations are used to generate multiple plausible value.

Mean, median imputation is simple and easy to implement. It maintains the original distribution of variables and preserves sample size. Best suitable even if data is skewed and having outlier. More accurate estimates can be calculated for missingness in dependent variables.

Mean and median imputation can lead to inaccurate, underestimate variability and distort relationships if data is not missing at random. When using prediction and multiple imputation, it required more computational resources and models.

**QUESTION 3:****A)**

Assign the file path of Cystic fibrosis text file to cystfibr and read it as dataframe using table() function and first column of text file is column name so header is passed as true, table function helps to read data from text file by auto detecting the delimiter and structure of Data.

View function is used to view the Dataframe in rstudio and print is used to print the data frame to verify the structure of data.

Attach function is used to make the dataframe easily accessible by adding to local path, with this we can easily access the column in dataframe without explicitly using \$ operator. We directly called Age column, because of attach function its directly called and printed.

```
cystfibr<-"C:/Users/elangovan.paramasiva/Desktop/DS/sem 2/KL7012_ Stastitical/dataqn3.txt"
cystfibr_df <- read.table(cystfibr, header = TRUE)
View(cystfibr_df)
print(cystfibr_df)
attach(cystfibr_df)
print(age)

> cystfibr<-"C:/Users/elangovan.paramasiva/Desktop/DS/sem 2/KL7012_ Stastitical/dataqn3.txt"
> cystfibr_df <- read.table(cystfibr, header = TRUE)
> View(cystfibr_df)
> print(cystfibr_df)
  age sex height weight bmp fev1  rv frc tlc pemax
1   7   0     109   13.1  68    32 258 183 137    95
2   7   1     112   12.9  65    19 449 245 134    85
3   8   0     124   14.1  64    22 441 268 147   100
4   8   1     125   16.2  67    41 234 146 124    85
5   8   0     127   21.5  93    52 202 131 104    95
6   9   0     130   17.5  68    44 308 155 118    80
7  11   1     139   30.7  89    28 305 179 119    65
8  12   1     150   28.4  69    18 369 198 103   110

> attach(cystfibr_df)
> print(age)
[1]  7  7  8  8  9 11 12 12 13 13 14 14 15 16 17 17 17 17 19 19 20 23 23 23
```

**QUESTION 3:****B)**

```
summary(cystfibr_df)
```

```
> summary(cystfibr_df)
  age          sex      height      weight      bmp
  Min.   : 7.00  Min.   :0.00  Min.   :109.0  Min.   :12.9  Min.   :64.00
  1st Qu.:11.00 1st Qu.:0.00  1st Qu.:139.0  1st Qu.:25.1  1st Qu.:68.00
  Median :14.00  Median :0.00  Median :156.0  Median :37.2  Median :71.00
  Mean   :14.48  Mean   :0.44  Mean   :152.8  Mean   :38.4  Mean   :78.28
  3rd Qu.:17.00 3rd Qu.:1.00  3rd Qu.:174.0  3rd Qu.:51.1  3rd Qu.:90.00
  Max.   :23.00  Max.   :1.00  Max.   :180.0  Max.   :73.8  Max.   :97.00
  fev1          rv       frc      tlc      pemax
  Min.   :18.00  Min.   :158.0  Min.   :104.0  Min.   : 81  Min.   : 65.0
  1st Qu.:26.00 1st Qu.:188.0  1st Qu.:127.0  1st Qu.:101  1st Qu.: 85.0
  Median :33.00  Median :225.0  Median :139.0  Median :113  Median : 95.0
  Mean   :34.72  Mean   :255.2  Mean   :155.4  Mean   :114  Mean   :109.1
  3rd Qu.:44.00 3rd Qu.:305.0  3rd Qu.:183.0  3rd Qu.:128  3rd Qu.:130.0
  Max.   :57.00  Max.   :449.0  Max.   :268.0  Max.   :147  Max.   :195.0
```

Based on the result of summary of Cystic fibrosis dataset, it contains 10 columns, among this sex is only categorical and all others are continuous features.

Age: It ranges from 7 to 23 years, with mean of 14.48 shows majority of individuals falling between 11 and 17 years old.

Sex: It is a categorical variable where 0 as male and 1 as female with slight domination by males.

Height and Weight: Heights of individuals range from 109 to 180 mm and Weights ranges between 12.9 to 73.8 Kg, with median height of 156 cm, weight of 37.2Kg and mean height of 152.8 cm, weight of 38.4kg. Based on this, each distribution appears lightly skewed left with more individuals having height below the mean.

BMP: Value ranges from 63 to 97 with median 71 and mean 78.28. most individuals would have BMP values above the mean.

FEV1 & RV : FEV has Median Value of 33, with mean of 34.72 and range from 18 – 57 and RV has median of 225 and mean of 255.2 and range from 158 to 449. Both show wide variability among data.

FRC, TRC & Pemax: these all have large range, and it shows maximum variability across individuals.

These analyses help us to understand datatypes, distribution of data and characteristics of individuals in dataset. This helps as foundation for further analysis and preprocessing to be performed and statistical techniques can be used to find any relations across variables.

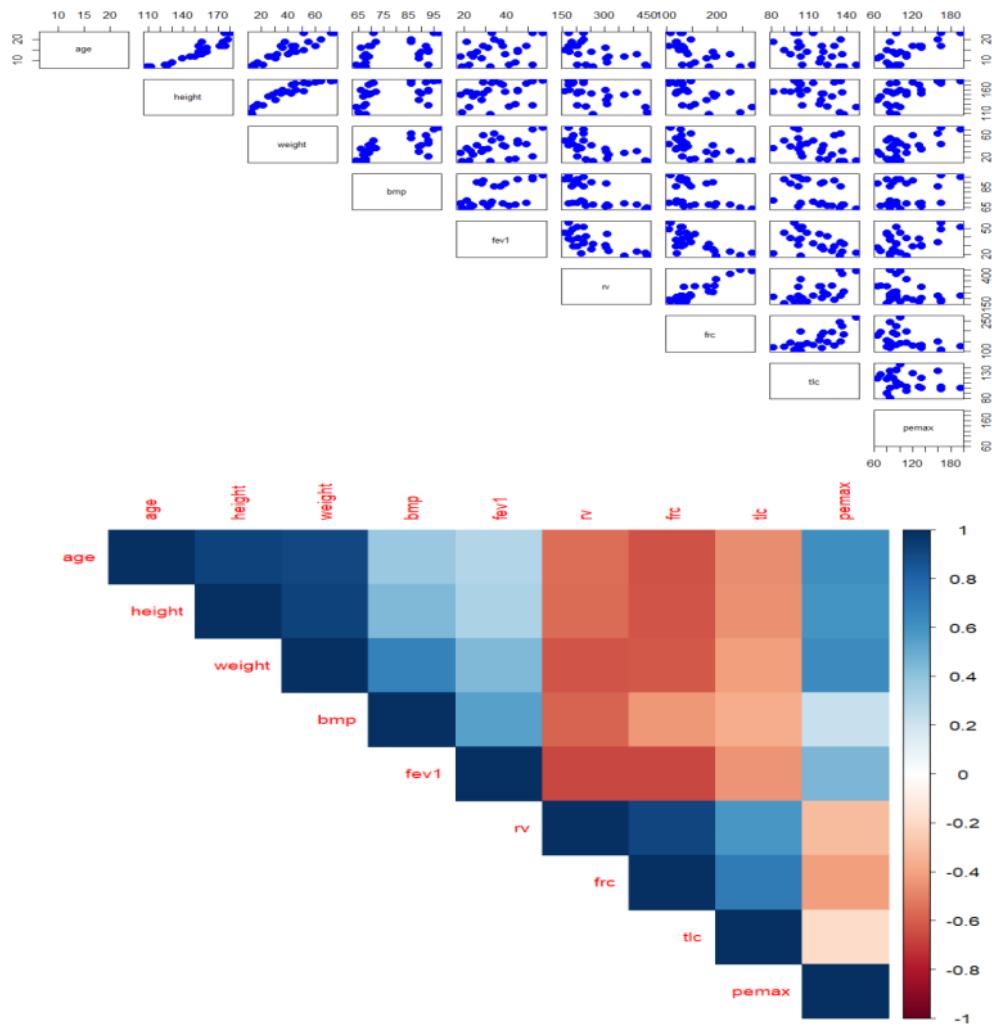
## QUESTION 4:

a)

```

cys_feature <- c("age", "height", "weight", "bmp", "fev1", "rv", "frc",
"tlc", "pemax")
pairs(cystfibr_df[, cys_feature],
      main = "Scatterplot Matrix",
      pch = 16,
      col = "blue",
      cex = 1.5,
      lower.panel = NULL)
library(corrplot)
cor_matrix <- cor(cystfibr_df[, c(cys_feature)])
corrplot(cor_matrix, method = "color", type = "upper", tl.cex = 0.8)

```



Pair function is used to create scatter plot for all variables in the dataframe. We used dot as marker for data and to ease the interpreting of plot lower panel = null is passed, as it is redundant, and it is mirror of the upper panel.

While interpreting the plot, there is a linear relationship for age with height and weight means whenever age is increasing both height and weight is increasing and similar relationship is showing for frc and rv whenever frc increasing rv also increasing and vice versa

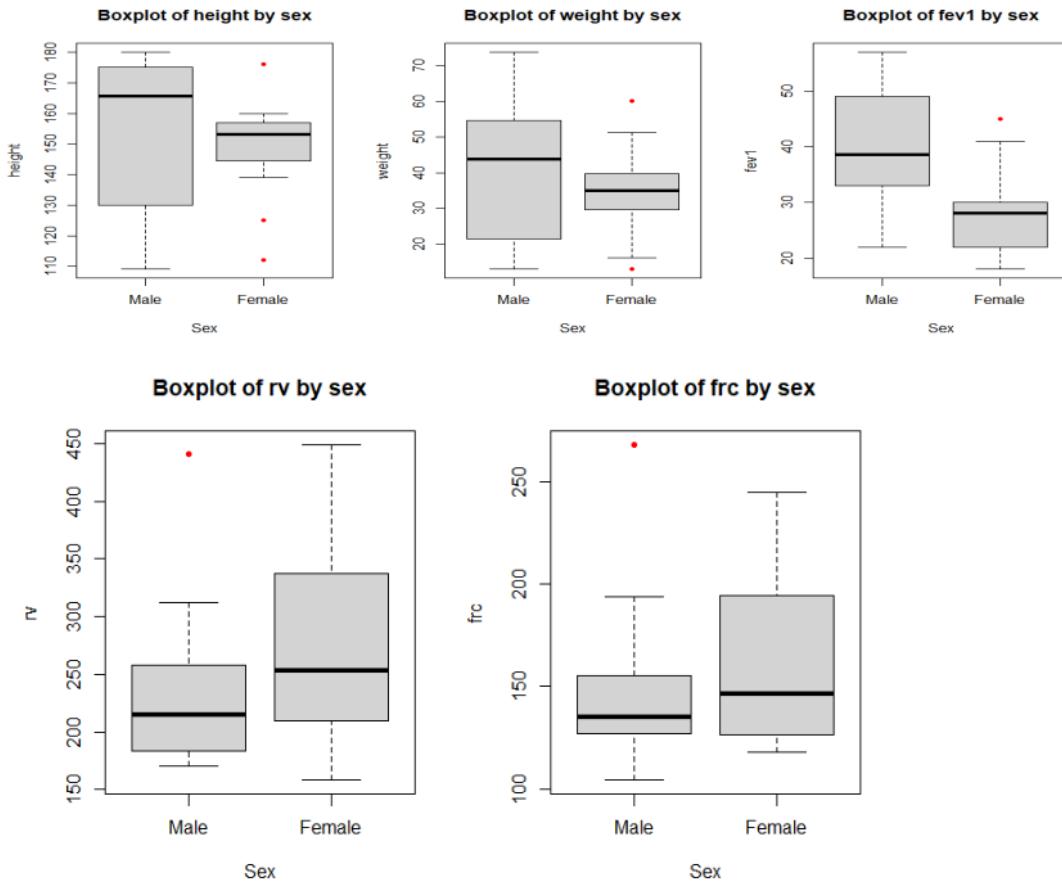
Other plots are scattered much, so get the exact relation correlation plot for the feature is used. From this age, height, weight are positively correlated with pemax. Bmp positively correlated with weight and negatively correlated with rv. rv and frc are highly negatively correlated with fev1. This overall finding helps to understand the relationship between variables, based on various preprocessing like feature engineering, removing can be done and thus helps in improving the accuracy of the developed model.

**b)**

The box plot for the features in Cystic fibrosis dataset it is observed that 5 features having outlier and 3 features didn't having any outlier. let's discuss those in details

```
cystfibr_bxpt <- c( "height", "weight", "fev1", "rv", "frc", "bmp", "tlc",  
"pemax")  
par(mfrow = c(2, 5))  
  
for (variable in cystfibr_bxpt) {  
  boxplot(cystfibr_df[[variable]] ~ cystfibr_df$sex,  
          main = paste("Boxplot of", variable, "by sex"),  
          xlab = "Sex",  
          ylab = variable,  
          outcol = "red",  
          outpch = 16)  
}
```

## Features having Outlier :



**Height:** Based on above figure it is observed that male is taller than female and female is having outliers with values of 180, 110, 120 which deviates from typical range of 130-155.

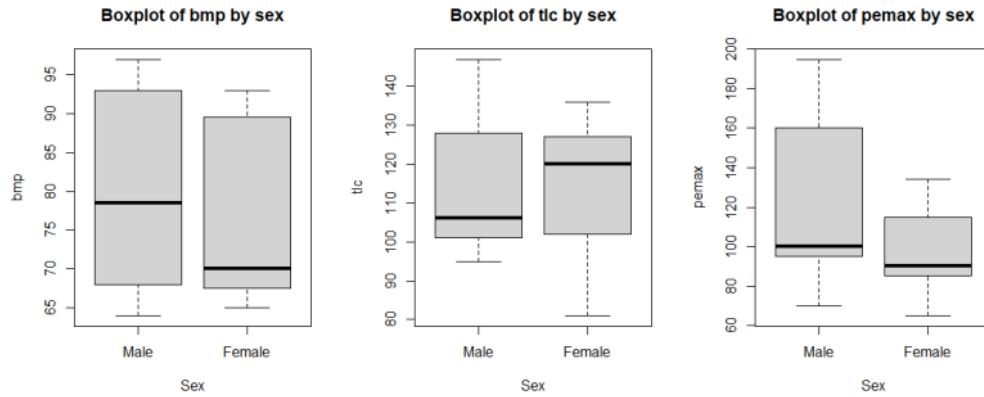
**Weight:** Similar to height, male weighs more than female and female having outliers with values of 60, 9 where the mean is at 35 and values ranges between 30-40.

**FEV1:** male is having greater fev1 than female and female is having typical range of 20 – 30 and mean is at 28 and it is having 1 outlier with value of 45.

**RV:** Female RV is generally higher than male and male is having outlier at 440 where mean is at 220 and it shows a significant deviation from typical male value range of 170 – 260.

**FRC:** A male outlier of 280 is noted , where the mean I at 140 and ranges between 130 – 160 and average frc of female is higher than male.

## No Outlier:



**BMP:** While no outlier is observed, where male BMP value is slightly higher than female values.

**TLC:** No outlier is detected and the range of both male and female is almost similar but the mean of female exceeds the male.

**PEMAX:** Similar to above there is no outlier in Pemax too. Even though mean is nearly identical, the range of male is broader indicates greater variation.

To conclude, Outliers in variables like height, weight, FEV1, RV, and FRC may be due to anomalies, measurement error, entry error or exceptional cases and it will cause measuring wrong central tendency, variability and biased statistical test (Purohit, 2021). So, these outliers should be treated by imputation, trimming or any of the advanced models with domain knowledge. While the variables BMP, TLC, Pemax do not show any outliers which offers valuable insights. By treating the outliers, accurate statistics will be calculated which helps in improving the performance of the model.

**QUESTION 5:**

From the question, it is observed that, need to find the probability of a specific number of recoveries out of fixed number of independent hearts operations.

- The possible outcome would be patient recovered or not.
- The fixed number of patients and outcome of each patient is independent.
- The probability of success is constant which is 0.87.

From the above all, binomial probability distribution suits, as probability is discrete values and the outcome is either success or failure, independent repeated trials, constant success probability (Yagin, Guldogan and Colak, 2021).

$$P(X = k) = {}^nC_k p^k q^{n-k}$$

$$n = \text{number of independent trials}$$

$$k = \text{number of successes in } n \text{ trials}$$

$$p = \text{probability of success in single trial}$$

$$q = \text{probability of failure in single trial}$$

based on this, for the given question

**Manual calculation:**

$$n = 8, p = 0.87, q = 1 - p = 0.13, k = 5$$

$$\begin{aligned} P(X=5) &= {}^8C_5 * (0.87)^5 * (0.13)^{8-5} \\ P(X=5) &= (8! / (5! * 3!)) * (0.87)^5 * (0.13)^{8-5} \\ P(X=5) &= 56 * (0.87)^5 * (0.13)^3 \\ P(X=5) &= 56 * 0.498 * 0.002197 \\ P(X=5) &= 0.0602 \\ P(X=5) &= 6.02\% \end{aligned}$$

**In R:**

```
x <- 5
n <- 8
p <- 0.87
q <- 1-p = 0.13
dbinom(x, n, p)
y <- dbinom(5, 8, 0.87)
y

> x <- 5
> n <- 8
> p <- 0.87
> q <- 1-p
> y <- dbinom(x, n, p)
> y
[1] 0.06132172
```

To conclude, based on both manual calculation and binom function in R, the probability of exactly 5 out of the next 8 patients surviving the delicate heart operation is estimated to be approximately 6.02%.

**QUESTION 6:**

Based on the above statement, there is need to compute random variables distributed over time. Receiving 8 emails in a time is called poison random variables and there is a need to compute probability over time, so its distribution is poison random distribution (Yagin, Guldogan and Colak, 2021).

$$P(X = k) = (e^{-m} \cdot m^k) / k! \text{ for } k = 0, 1, 2, \dots$$

where: X = number of successes m = average number of successes in each time interval or space

$$e = 2.718281$$

**Manual Calculation:**

$$\begin{aligned} m &= 6, X = 8 \\ &= (1/(2.71)^6 \cdot 6^8) * 8! \\ &= (0.00247876 * 1679616) / 40320 = 4163.36862.36 / 40320 \\ &= 0.10325 \end{aligned}$$

**In R:**

```
lbd <- 6
k <- 8
prb_8_email <- dpois(k, lbd)
print(prb_8_email)

> lbd <- 6
> k <- 8
> prb_8_email <- dpois(k, lbd)
> print(prb_8_email)
[1] 0.1032577
```

Based on the calculation using the Poisson distribution with an average rate of 6 emails per minute, the probability of receiving exactly 8 emails in any given minute is approximately 0.10325 or 10.3%. This result is consistent with the probability obtained from both manual calculation and the use of the `dpois` function in R Studio.

**QUESTION 7:**

By the statement in question, mean is 14600 litres and Standard deviation is 2600 litres, this small SD shows data points are present closely around the mean, visualizing it will form a bell shaped distribution of data, so this follows a normal distribution (Yagin, Guldogan and Colak, 2021).

The normal distribution can be standardized by converting it into Z score using mean and SD. Tables can be used to get probability for the z score or In R, P norm function is used to compute probabilities associated with the standard normal distribution using the calculated Z score.

```
mean_lit <- 14600
SD_lit <- 2600
X_lit <- 10000
Z <- (X_lit - mean_lit) / SD_lit

prob_X_lit <- 1 - pnorm(Z)
print(prob_X_lit)

> mean_lit <- 14600
> SD_lit <- 2600
> X_lit <- 10000
> Z <- (X_lit - mean_lit) / SD_lit
> prob_X_lit <- 1 - pnorm(Z)
> print(prob_X_lit)
[1] 0.9615723
```

The output probability of approximately 0.96157 shows that there is a more chances (96.16%) of selling more than 10,000 litres of fuel on a particular day.

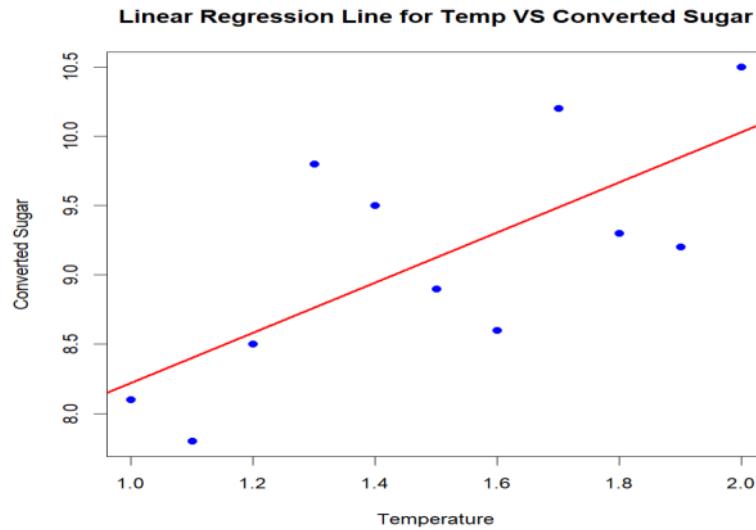
**QUESTION 8:**

a)

The temperature and converted sugar data is read as a dataframe. Then lm function is used to perform linear regression analysis and based on it, the regression line is draw on the plot representing temperature versus converted sugar.

```
temp <- c(1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0)
conv_sugar <- c(8.1, 7.8, 8.5, 9.8, 9.5, 8.9, 8.6, 10.2, 9.3, 9.2,
10.5)
sug_df <- data.frame(temp, conv_sugar)
lin_model <- lm(conv_sugar ~ temp, data = sug_df)
plot(temp, conv_sugar, pch = 16, col = "blue", main = "Linear
Regression Line for Temp VS Converted Sugar", xlab = "Temperature",
ylab = "Converted Sugar")
```

```
abline(lin_model, col = "red", lwd = 2)
```



```
summary(lin_model)
```

```
> summary(lin_model)
```

```
Call:
lm(formula = conv_sugar ~ temp, data = sug_df)
```

**Residuals:**

Min	1Q	Median	3Q	Max
-0.7082	-0.4868	-0.1227	0.5109	1.0346

**Coefficients:**

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	6.4136	0.9246	6.936	6.79e-05 ***
temp	1.8091	0.6032	2.999	0.015 *

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6326 on 9 degrees of freedom

Multiple R-squared: 0.4999, Adjusted R-squared: 0.4443

F-statistic: 8.996 on 1 and 9 DF, p-value: 0.01497

**Residuals:** which indicates the difference between observed and predicted values. Here the min residual is -0.7 and max is 1.03 which shows there is variability in residuals.

**Coefficients:**

**Intercept:** 6.413 Represents value of converted sugar when temperature is zero.

**Temperature:** Whenever there is an increase in temperature by one unit, converted sugar is increased by 1.8091.

**Significance codes:** level of significance of coefficient with 0 as highly significant.

**Residual standard error:** This shows estimates of SD of the residuals. 0.6326 it fits the model well

**Multiple R-squared and Adjusted R-squared:** 44.4% of variance in the converted sugar is explained by temperature.

**F statistic and P value:** an F-statistic of 8.996 indicates that the variability explained by the linear regression model is significantly greater than the variability left unexplained and P value of 0.01497 is <sup>8</sup> less than 0.05 significance level, so null hypothesis can be rejected and it is evident that there is significant linear relationship between temperature and converted sugar.

**8b)**

From the above summary, B0 (Intercept) = 6.4136 B1(Slope) = 1.8091

$$Y = B_0 + B_1 x$$

$$Y = 6.4136 + 1.8091 \cdot x$$

Where  $x = 1.75$

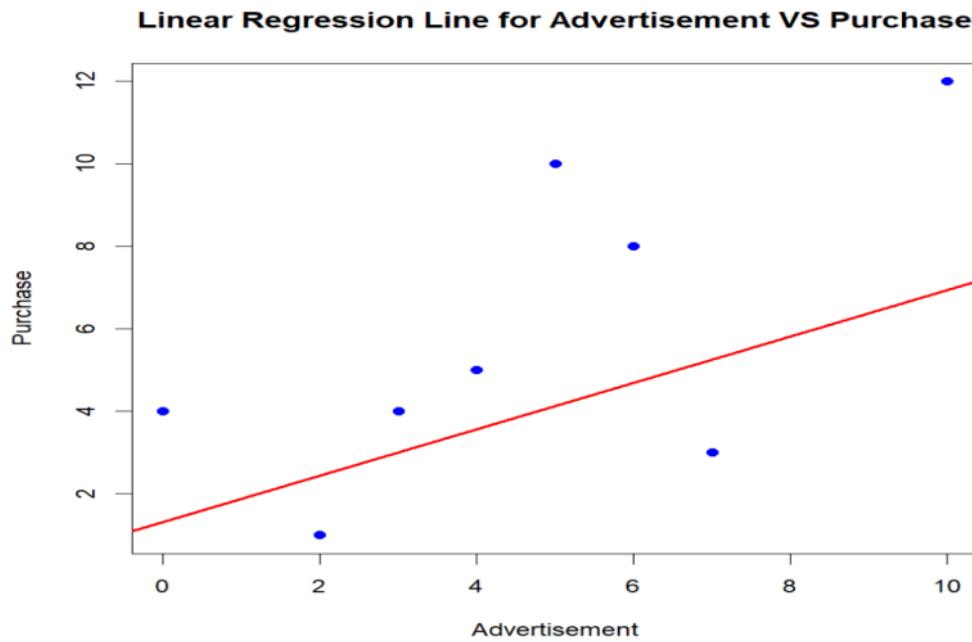
$$Y = 6.4136 + 1.8091 \cdot 1.75 = 6.4136 + 3.165 = 9.578$$

When temperature is 1.75, the mean amount of sugar converted is 9.58.

#### QUESTION 9:

```
adv <- c(0, 10, 4, 5, 2, 7, 3, 6)
purs <- c(4, 12, 5, 10, 1, 3, 4, 8)
correlation <- cor(adv, purs)
print(correlation)

> adv <- c(0, 10, 4, 5, 2, 7, 3, 6)
> purs <- c(4, 12, 5, 10, 1, 3, 4, 8)
> correlation <- cor(adv, purs)
> print(correlation)
[1] 0.6790033
```



The 12 assumption of using the coefficient of correlation assumes linearity that means there is linear relationship between two variables. The correlation coefficient between the number of advertisements and purchases made is approximately 0.679. This indicates a moderately strong positive linear relationship between the two variables, which shows whenever number of advertisement increases, number of purchases also increase and the plot also shows that there is a linear relationship between variables.

```
cor_test <- cor.test(adv, purs)
print(cor_test)

> cor_test <- cor.test(adv, purs)
> print(cor_test)

  Pearson's product-moment correlation

data: adv and purs
t = 2.2655, df = 6, p-value = 0.06406
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
-0.04922043 0.93588054
sample estimates:
cor
0.6790033
```

The p-value of 0.06406 is greater than the significance level of 0.05, which shows that the correlation coefficient is not significant at the 5% level. This suggests that we cannot

reject null hypotheses and cannot conclude with 95% confidence that there is a true linear relationship between the number of advertisements and purchases made. Even though there is positive relationship between advertisements and purchases made, strength of this relationship is not statistically significant.

#### QUESTION 10:

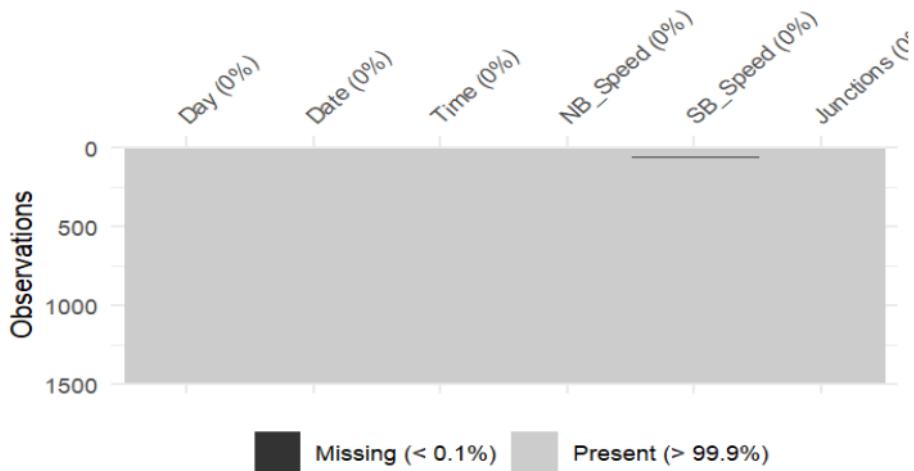
##### Introduction:

The success of manufacturing organizations depends on effective procurement, manufacturing, and distribution strategies. As one of our customers is in London, where lorries need to travel on the M1 motorway which contains different junctions and large variation of speed among junctions to deliver goods. M1 motorway connects between London to Leeds of about 193 miles long. In early days, highway had no crash barriers and speed limit. But after some time M1 road became busiest road and speed limit are placed. More traffics started happening across junctions and as per Metz, (2023) lot of business losses started due to long travel time. More policies are developed by Government for strategic road network (SRN) (Mohit Kumar Singh et al., 2024). As the director of a major manufacturing organization, I should plan for efficient delivery of goods in time to our customers. Understanding traffic patterns and speeds on roadways is crucial for efficient transportation (Batley et al., 2017) and timely delivery (Mesonis, Brackstone and Gravett, 2020). We aim to identify potential trends and patterns from our analysis. This report discusses about details of the data collected, sampling strategy, the statistical analyses undertaken, resulting conclusions, and any relevant background research and the above analysis, prior research will help to create transportation management strategies for our organization.

##### Details of Data collected and preprocessing:

The speed data were collected from the Traffic England website, a reliable source of real-time traffic information for major road networks in England, including the M1 motorway where our customer lorry needs to travel. which receives speed directly from the 74 loop detectors placed in north bound and southbound (Mesonis, Brackstone and Gravett, 2020). This website shows different traffic information like current speed, traffic cameras, incidents like road works, accident, abnormal. Traffic reports were accessed and saved for 4 different time across the entire week, ensuring wide coverage of traffic conditions along the M1 motorway. The details include day, Date, Time, Junctions, and their speeds between all the 53 junctions (Mohit Kumar Singh et al., 2024). then Collected data was compiled and stored in a csv format.

Data preprocessing helps to ensure the data quality and integrity of our dataset. The dataset comprises 1484 observations across 6 variables. Through a comprehensive examination using functions `vis_miss` we confirmed that there are less than 0.1% of missing values in the dataset, due to road works the speed is not calculated so that can be removed.



To capture the variability in traffic speed across different days and times, we grouped the dataset based on the Day and Time category variables. This categorization divides the data into meaningful segments, allowing us to focus our sampling on specific time intervals throughout the day. The four-time intervals - Night, Morning, Afternoon, and Evening, enable us to capture the variances in traffic speed patterns that vary according to the time of day.

```
> summary(traffic_data1)
      Day           Date           Time           NB_Speed        SB_Speed
Length:1484  Length:1484  Length:1484  Min.   : 0.00  Min.   : 3.00
Class :character  Class :character  Class :character  1st Qu.:51.00  1st Qu.:51.00
Mode  :character  Mode  :character  Mode  :character  Median  :62.00  Median  :61.00
                                         Mean   :58.97  Mean   :58.41
                                         3rd Qu.:67.00  3rd Qu.:66.00
                                         Max.   :70.00  Max.   :70.00
                                         NA's    :4       NA's    :3

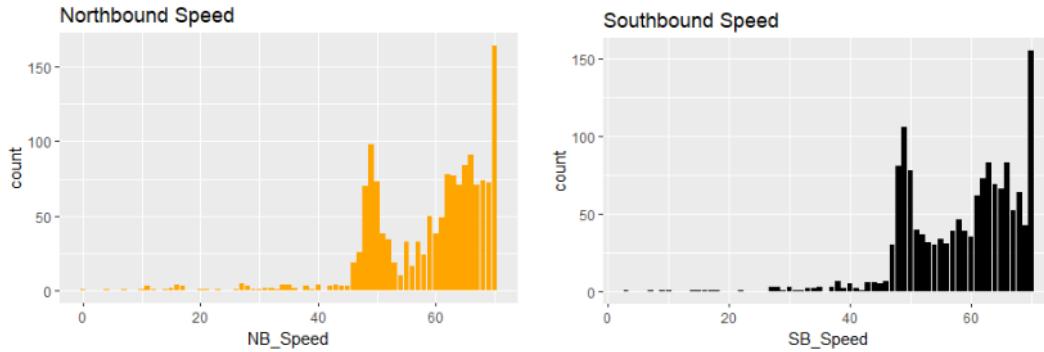
      Junctions      Time_category
Length:1484      Night      :371
Class :character  Morning   :371
Mode  :character  Afternoon:371
                           Evening  :371
```

### Sampling Strategy:

The dataset contains data from different days and times. To help customers delivery lorries to travel the length, understand the traffic at each time across all weeks is needed, then there should be representation from all combinations of day and time. If the data collection has only certain days or times over others, it may introduce bias into our analysis. To mitigate this bias, we should aim for a sampling strategy that includes data from various days of the week and different times of the day. To capture this variability, our sampling strategy should include data from both weekdays and weekends at different times like morning, afternoon, evening, and night. Based on all above-mentioned criteria, a stratified random sampling strategy would be most suitable.

**Stratified random sampling** involves dividing the population into distinct sub-groups based on certain characteristics. Here, dataset can be sub-grouped based on days of the week and time of the day. Then randomly sample each stratum to ensure representation from different days and times. This approach allows us to control potential biases and ensures that our sample is representative of the entire week and time.

### Distribution Analysis:



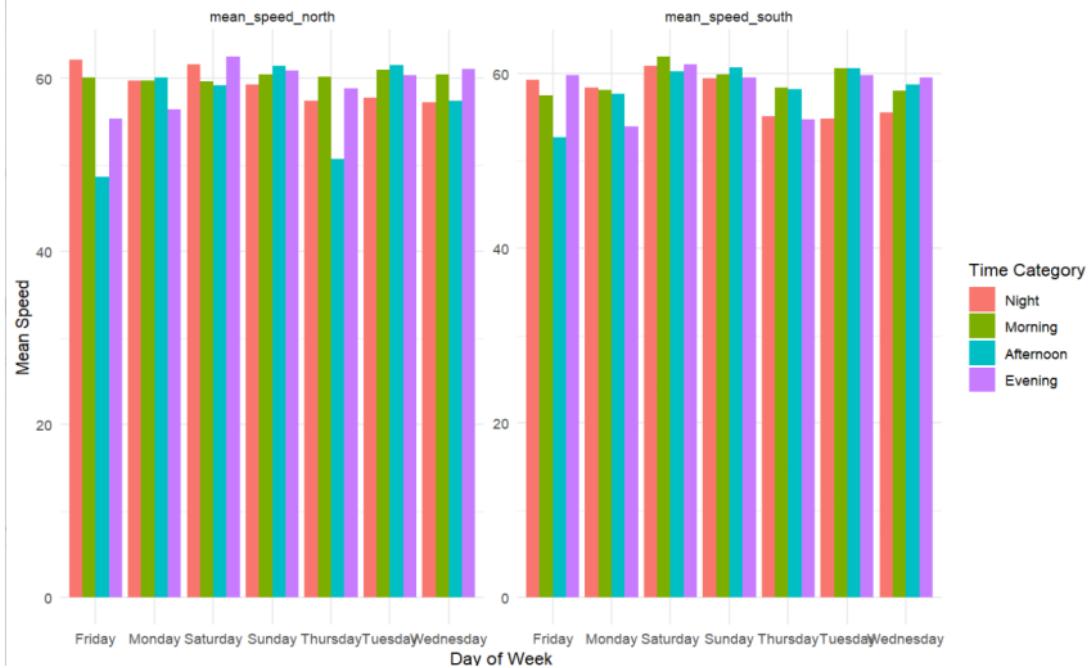
The ggplot is performed to understand the distribution of speed across junction in both poles. The distribution of northbound shows that 170+ counts of around 70mph as indicated by peak. Additionally, there is a gradual increase in count from speed 50mph with noticeable count of 80 for speed of 67mph. very few junctions has speed of 10-20mph and 30-40. Similarly, the south bound has 70mph speed at 150+ junctions. Additionally, there are few counts at lower speeds 10-20mph and in the range of 20-40 mph there are around 20+ counts. Comparing the distributions of both speeds, it's evident that both directions exhibit similar patterns, with the majority of junctions at high speeds around 70 mph with noticeable slower speed when travelling towards north bounds.

### Descriptive Statistics:

Day	Time_category	mean_speed_north	mean_speed_south	median_speed_north	median_speed_south	sd_speed_north	sd_speed_south
1	Friday	62.15094	59.26415	65	60.0	7.734529	6.788426
2	Friday	60.05660	57.54717	63	59.0	7.238825	7.977290
3	Friday	48.66038	52.71698	53	58.0	16.772165	14.546183
4	Friday	55.32075	59.81132	63	63.0	14.524215	8.442240
5	Monday	59.73585	58.37736	62	60.0	7.348864	8.428948
6	Monday	59.71698	58.13208	62	60.0	7.399006	8.304396
7	Monday	60.07547	57.64151	63	59.0	7.279711	8.036595
8	Monday	56.96623	53.98113	60	55.0	13.360878	10.369131
9	Saturday	61.62264	60.92453	65	63.0	8.174130	8.231854
10	Saturday	59.64151	61.96226	64	66.0	11.216565	8.478394
11	Saturday	59.16981	60.26415	65	62.0	12.934355	8.940295
12	Saturday	62.52830	61.09434	66	64.0	8.459414	8.669718
13	Sunday	59.32075	59.44000	60	60.5	7.255697	7.730565
14	Sunday	60.49057	59.86792	64	64.0	8.567880	9.434058
15	Sunday	61.45283	60.67925	66	64.0	10.395202	9.254466

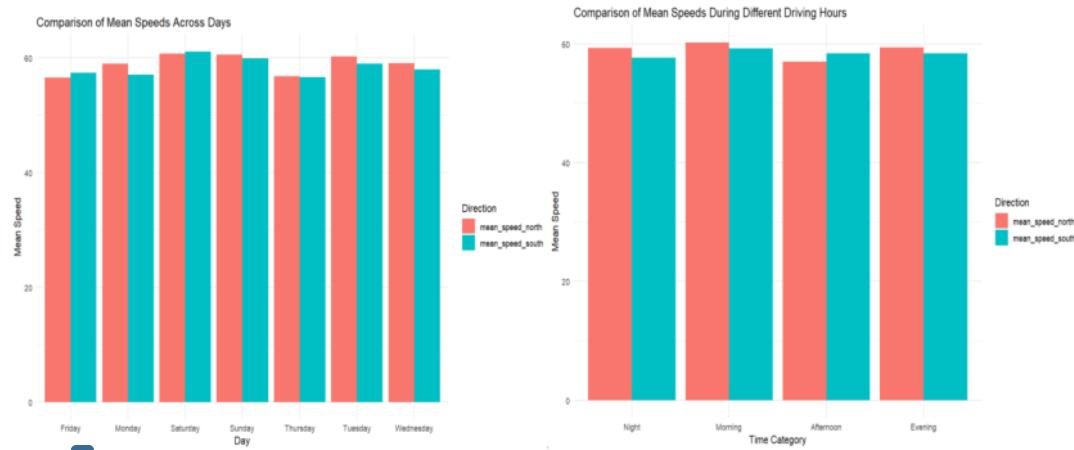
16	Sunday	Evening	60.86792	59.56604	63	62.0	7.658675	9.282965
17	Thursday	Night	57.37736	55.15094	57	56.0	6.291711	12.280999
18	Thursday	Morning	60.20755	58.39623	61	61.0	6.205948	8.828145
19	Thursday	Afternoon	50.67925	58.24528	49	62.0	17.051701	10.763017
20	Thursday	Evening	58.83019	54.75472	61	57.0	9.145692	9.972859
21	Tuesday	Night	57.76471	54.84906	60	55.0	8.693879	9.708038
22	Tuesday	Morning	60.96226	60.62264	63	63.0	7.698557	7.998140
23	Tuesday	Afternoon	61.52830	60.64151	65	63.0	7.589476	8.119526
24	Tuesday	Evening	60.35849	59.81132	63	62.0	10.777638	7.431887
25	Wednesday	Night	57.25490	55.58491	57	55.0	6.965180	5.654930
26	Wednesday	Morning	60.43396	58.01887	63	61.0	7.642265	10.225328
27	Wednesday	Afternoon	57.35849	58.73585	62	62.0	11.953587	10.211515
28	Wednesday	Evening	61.09434	59.52830	62	62.0	7.375281	7.357894

Mean Traffic Speeds by Day and Time Category



Based on the descriptive statistics provided, several key observations are made using mean and median speeds and standard deviations across different days and time categories. The consistency of mean and median speeds across different days and time suggests a relatively stable traffic flow. On weekends, mean and median are slightly higher, showing less traffic patterns. The standard deviations of speeds for both northbound and southbound traffic vary across different days and time, indicating differences in the spread of speed values. Days and time categories with higher standard deviations indicate greater variability in speed may be due to rush hour traffic volumes, road works. Saturday and Sunday mornings shows lower standard deviations compared

to weekdays, implying more consistent traffic speeds during these times. All weekdays evenings display higher standard deviations compared to other time periods, suggesting more variability in speed during these hours. Weekends show higher standard deviations in speed compared to weekdays, indicating greater variability in traffic flow. Overall, the traffic flow remains relatively consistent, but Weekdays generally experience smoother traffic flow with higher mean and median speeds, while weekends exhibit greater variability and slightly lower average speeds.



## 8 Two Sample T-test:

Day	Time_category	p_value
Friday	Night	0.04370702
Friday	Morning	0.09291423
Friday	Afternoon	0.18641459
Friday	Evening	0.05501750
Monday	Night	0.37855948
Monday	Morning	0.30199191
Monday	Afternoon	0.10533446
Monday	Evening	0.30108646
Saturday	Night	0.66222204
Saturday	Morning	0.23243955
Saturday	Afternoon	0.61357841
Saturday	Evening	0.39076402
Sunday	Night	0.93591763
Sunday	Morning	0.72280107

Day	Time_category	p_value
Sunday	Afternoon	0.68658000
Sunday	Evening	0.43280976
Thursday	Night	0.24373793
Thursday	Morning	0.22479377
Thursday	Afternoon	0.00761839
Thursday	Evening	0.03057783
Tuesday	Night	0.10946650
Tuesday	Morning	0.82418971
Tuesday	Afternoon	0.56259017
Tuesday	Evening	0.76160282
Wednesday	Night	0.18359914
Wednesday	Morning	0.17161225
Wednesday	Afternoon	0.52503178
Wednesday	Evening	0.27632715

Two Sample t-tests are used to compare mean speeds of northbound and southbound traffic on the M1 motorways. This test is used to determine whether there is a statistically

significant difference between the mean speeds between the northbound and southbound lanes. Speed of one lane won't affect another and there is equal variance so t test will be suitable test. Thursday Afternoon and Thursday Evening exhibit p-values of 0.00762 and 0.0306 indicating statistically significant differences in mean speeds between northbound and southbound traffic on Thursdays during the afternoon and evening hours. Remaining time categories indicates non-significant differences in mean speeds between northbound and southbound traffic. While significant differences are observed on certain days and times, the overall findings suggest relatively shows there is balanced traffic conditions between the two directions.

### Cluster Analysis:



The cluster analysis helps to visualize the traffic across northbound and southbound. There are 3 different cluster, where red cluster denotes high speeds in both the northbound and southbound directions. Most data points fall within this cluster, indicating frequent instances of high-speed. The green cluster represents a range of speeds between approximately 10 to 50 mph in the northbound direction and 50 to 70 mph in the southbound direction. This suggests a mix of slower northbound traffic and faster southbound traffic within this cluster. The black cluster exhibits speeds primarily ranging between 50 to 70 mph in the northbound and 10-60 in southbound directions, with some variability. Understanding these traffic patterns can help in route planning, resource allocation.

**Conclusion:**

Based on the above all wider analysis on traffic data, several key insights have been derived which help to take formal decision making on delivery goods through lorry via M1 road. Firstly, the distribution analysis revealed that the speed distribution for both northbound and southbound lanes follow a relatively normal pattern with the majority of speeds clustering around 60-70 range. the t-test performed to compare mean speeds between northbound and southbound lanes showed no significant difference in speeds. Descriptive statistics highlights variations in speed based on factors such as time of day and day of the week, with certain periods experiencing higher or lower speeds than others.

To conclude, the analysis suggests that while traffic speeds show variability based on factors such as time and day. Monday mornings and Friday evenings shows lower mean, so experiencing higher traffic volumes due to people travel for weekend activities and travel home from work, return to work and school after the weekend. While weekend mornings like Sunday morning, Saturday Afternoon shows relatively high mean speeds for both northbound and southbound lanes making it a suitable time for delivery planning. Deliveries planned during this time may encounter lighter traffic compared to weekdays, potentially leading to faster transit times (Batley et al., 2017). As the director, this analysis used to strategically plan delivery routes and schedules along the M1 road, considering peak traffic periods and optimizing efficiency to meet the requirements of potential customers. Additionally, tracking real-time traffic data and monitoring traffic patterns, seasonal pattern can provide valuable insights for adjusting delivery schedules to avoid high-traffic periods and ensure smoother transportation operations.

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## APPENDIX:

R code for Question 10.

```
library(visdat)
library(dplyr)
library(ggplot2)
library(tidyr)
traffic_data1 <- read.csv("C:/Users/elangovan.paramasiva/Downloads/qn10updated.csv")
dim(traffic_data1)
str(traffic_data1)
vis_miss(traffic_data1)
unique(traffic_data1$Time)

#conv time into catg as it is easier for comparison
traffic_data1 <- traffic_data1[traffic_data1$Time != "", ]
traffic_data1$Timenew <- as.POSIXct(traffic_data1$Time, format = "%I:%M %p")
traffic_data1$Hour <- as.numeric(format(traffic_data1$Timenew, "%H"))
time_intervals <- c(0, 6, 12, 18, 24)
traffic_data1$Time_category <- cut(traffic_data1$Hour,
                                    breaks = time_intervals,
                                    labels = c("Night", "Morning", "Afternoon", "Evening"),
                                    include.lowest = TRUE)
traffic_data1 <- subset(traffic_data1, select = -c(Hour, Timenew))
summary(traffic_data1)

#Sampling Strategy
set.seed(123)
sample_size <- 53
sampled_data <- traffic_data1 %>%
  group_by(Day, Time_category) %>%
  sample_n(sample_size, replace = FALSE)
summary(sampled_data)
#Plot for analysis
ggplot(aes(x = NB_Speed), data = sampled_data) + geom_bar(stat = "count", fill = 'orange') +
  ggtitle("Northbound Speed")

ggplot(aes(x = SB_Speed), data = sampled_data) + geom_bar(stat = "count", fill = 'black') +
  ggtitle("Southbound Speed")

descriptive_stats <- sampled_data %>%
  group_by(Day, Time_category) %>%
  summarise(mean_speed_north = mean(NB_Speed, na.rm = TRUE),
           mean_speed_south = mean(SB_Speed, na.rm = TRUE),
           median_speed_north = median(NB_Speed, 8 .rm = TRUE),
           median_speed_south = median(SB_Speed, na.rm = TRUE),
           sd_speed_north = sd(NB_Speed, na.rm = TRUE),
           sd_speed_south = sd(SB_Speed, na.rm = TRUE))
print(descriptive_stats, n=28)

plot_data <- tidyr::pivot_longer(descriptive_stats,
                                   cols = c(mean_speed_north, mean_speed_south),
                                   names_to = "Direction",
                                   values_to = "Mean_Speed")
ggplot(plot_data, aes(x = Day, y = Mean_Speed, fill = Time_category)) +
  geom_bar(stat = "identity", position = "dodge") +
  facet_wrap(~ Direction, scales = "free_y", ncol = 2) +
  labs(title = "Mean Traffic Speeds by Day and Time Category",
       x = "Day of Week",
       y = "Mean Speed",
       fill = "Time Category") +
  theme_minimal()
```

```

# comp mean speed across days and time
hypothesis_test <- sampled_data %>%
  group_by(Day, Time_category) %>%
  summarise(p_value = t.test(NB_Speed, SB_Speed)$p.value)
print(hypothesis_test, n=28)

time_anova <- sampled_data %>%
  group_by(Time_category) %>%
  summarise(mean_speed_north = mean(NB_Speed, na.rm = TRUE),
            mean_speed_south = mean(SB_Speed, na.rm = TRUE)) %>%
  pivot_longer(cols = starts_with("mean_speed"),
               names_to = "Direction",
               values_to = "Mean_Speed") %>%
  ungroup() %>%
  ggplot(aes(x = Time_category, y = Mean_Speed, fill = Direction)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(title = "Comparison of Mean Speeds During Different Driving Hours",
       x = "Time Category",
       y = "Mean Speed",
       fill = "Direction") +
  theme_minimal()

day_anova <- sampled_data %>%
  group_by(Day) %>%
  summarise(mean_speed_north = mean(NB_Speed, na.rm = TRUE),
            mean_speed_south = mean(SB_Speed, na.rm = TRUE)) %>%
  pivot_longer(cols = starts_with("mean_speed"),
               names_to = "Direction",
               values_to = "Mean_Speed") %>%
  ungroup() %>%
  ggplot(aes(x = Day, y = Mean_Speed, fill = Direction)) +
  geom_bar(stat = "identity", position = "dodge") +
  labs(title = "Comparison of Mean Speeds Across Days",
       x = "Day",
       y = "Mean Speed",
       fill = "Direction") +
  theme_minimal()
print(day_anova)
print(time_anova)

#cluster analysis

any_na <- anyNA(sampled_data[, c("NB_Speed", "SB_Speed")])

if (any_na) {
  sampled_data1 <- na.omit(sampled_data[, c("NB_Speed", "SB_Speed")])
}
par(mfrow=c(1,1))
kmeans_cluster <- kmeans(sampled_data1, centers = 3, nstart = 10)
plot(sampled_data1$NB_Speed, sampled_data1$SB_Speed,
     col = kmeans_cluster$cluster,
     xlab = "Northbound Speed", ylab = "Southbound Speed",
     main = "K-means Clustering of Traffic Speeds")

```

**Dataset:** Recorded 4 different times in a day for a week across 53 Junctions (53\*4) = 212/day = 212\*7 = 1484 samples. The dataset is also uploaded in drive – [Dataset Traffic England](#)

Day	Date	Time	NB_Speed	SB_Speed	Junctions	Sunday	28/04/2024	6:00 PM	69	6:1 J1-J2	Monday	29/04/2024	1:00 AM	64	52 J1-J2	
Sunday	28/04/2024	1:00 AM	70	57	J1-J2	Sunday	28/04/2024	6:30 PM	70	65 J2-J4	Monday	29/04/2024	1:00 AM	67	64 J2-J4	
Sunday	28/04/2024	1:00 AM	64	60	J2-J4	Sunday	28/04/2024	6:00 PM	70	69 J4-J5	Monday	29/04/2024	1:00 AM	68	67 J4-J5	
Sunday	28/04/2024	1:00 AM	55	68	J4-J5	Sunday	28/04/2024	6:00 PM	67	67 J5-J6	Monday	29/04/2024	1:00 AM	62	63 J5-J6	
Sunday	28/04/2024	1:00 AM	57	67	J5-J6	Sunday	28/04/2024	6:00 PM	68	70 J6-J6A	Monday	29/04/2024	1:00 AM	63	70 J6-J6A	
Sunday	28/04/2024	1:00 AM	60	65	J6-J6A	Sunday	28/04/2024	6:00 PM	63	65 J6A-J7	Monday	29/04/2024	1:00 AM	62	60 J6A-J7	
Sunday	28/04/2024	1:00 AM	60	61	J6A-J7	Sunday	28/04/2024	6:00 PM	56	56 J7-J8	Monday	29/04/2024	1:00 AM	52	54 J7-J8	
Sunday	28/04/2024	1:00 AM	52	54	J7-J8	Sunday	28/04/2024	6:00 PM	64	65 J8-J9	Monday	29/04/2024	1:00 AM	64	59 J8-J9	
Sunday	28/04/2024	1:00 AM	62	58	J8-J9	Sunday	28/04/2024	6:00 PM	43	63 J9-J10	Monday	29/04/2024	1:00 AM	59	60 J9-J10	
Sunday	28/04/2024	1:00 AM	59	57	J9-J10	Sunday	28/04/2024	6:00 PM	17	42 J10-J11	Monday	29/04/2024	1:00 AM	47	38 J10-J11	
Sunday	28/04/2024	1:00 AM	57	50	J10-J11	Sunday	28/04/2024	6:00 PM	53	38 J11-J11A	Monday	29/04/2024	1:00 AM	48	34 J11-J11A	
Sunday	28/04/2024	1:00 AM	49	50	J10-J11	Sunday	28/04/2024	6:00 PM	53	69 J11-J11A	Monday	29/04/2024	1:00 AM	47	48 J11A-J12	
Sunday	28/04/2024	1:00 AM	48	49	J11-J11A	Sunday	28/04/2024	6:00 PM	54	84 J11A-J12	Monday	29/04/2024	1:00 AM	59	60 J11A-J12	
Sunday	28/04/2024	1:00 AM	48	49	J11A-J12	Sunday	28/04/2024	6:00 PM	50	48 J12-J13	Monday	29/04/2024	1:00 AM	53	49 J12-J13	
Sunday	28/04/2024	1:00 AM	51	52	J12-J13	Sunday	28/04/2024	6:00 PM	66	61 J13-J14	Monday	29/04/2024	1:00 AM	62	58 J13-J14	
Sunday	28/04/2024	1:00 AM	66	57	J13-J14	Sunday	28/04/2024	6:00 PM	68	70 J14-J15	Monday	29/04/2024	1:00 AM	65	66 J14-J15	
Sunday	28/04/2024	1:00 AM	65	64	J14-J15	Sunday	28/04/2024	6:00 PM	61	69 J15-J15A	Monday	29/04/2024	1:00 AM	62	61 J15-J15A	
Sunday	28/04/2024	1:00 AM	57	64	J15-J15A	Sunday	28/04/2024	6:00 PM	30	68 J15A-J16	Monday	29/04/2024	1:00 AM	66	65 J15A-J16	
Sunday	28/04/2024	1:00 AM	57	63	J15A-J16	Sunday	28/04/2024	6:00 PM	67	69 J16-J17	Monday	29/04/2024	1:00 AM	66	65 J16-J17	
Sunday	28/04/2024	1:00 AM	55	64	J16-J17	Sunday	28/04/2024	6:00 PM	69	70 J17-J18	Monday	29/04/2024	1:00 AM	67	61 J17-J18	
Sunday	28/04/2024	1:00 AM	64	64	J17-J18	Sunday	28/04/2024	6:00 PM	65	68 J18-J19	Monday	29/04/2024	1:00 AM	62	51 J18-J19	
Sunday	28/04/2024	1:00 AM	65	54	J18-J19	Sunday	28/04/2024	6:00 PM	70	70 J19-J20	Monday	29/04/2024	1:00 AM	66	59 J19-J20	
Sunday	28/04/2024	1:00 AM	70	66	J19-J20	Sunday	28/04/2024	6:00 PM	70	60 J20-J21	Monday	29/04/2024	1:00 AM	64	66 J20-J21	
Sunday	28/04/2024	1:00 AM	68	67	J20-J21	Sunday	28/04/2024	6:00 PM	68	70 J21-J21A	Monday	29/04/2024	1:00 AM	62	65 J21-J21A	
Sunday	28/04/2024	1:00 AM	63	69	J21-J21A	Sunday	28/04/2024	6:00 PM	70	70 J21A-J22	Monday	29/04/2024	1:00 AM	64	68 J21A-J22	
Sunday	28/04/2024	1:00 AM	68	70	J21A-J22	Sunday	28/04/2024	6:00 PM	70	69 J22-J23	Monday	29/04/2024	1:00 AM	66	66 J22-J23	
Sunday	28/04/2024	1:00 AM	63	70	J22-J23	Sunday	28/04/2024	6:00 PM	70	70 J23-J23A	Monday	29/04/2024	1:00 AM	61	68 J23-J23A	
Sunday	28/04/2024	1:00 AM	67	57	J23-J23A	Sunday	28/04/2024	6:00 PM	61	64 J23A-J24	Monday	29/04/2024	1:00 AM	59	60 J23A-J24	
Sunday	28/04/2024	1:00 AM	61	53	J23A-J24	Sunday	28/04/2024	6:00 PM	50	51 J24A-J24A	Monday	29/04/2024	1:00 AM	50	51 J24A-J24A	
Sunday	28/04/2024	1:00 AM	52	49	J24A-J24A	Sunday	28/04/2024	6:00 PM	49	49 J24A-J25	Monday	29/04/2024	1:00 AM	48	50 J24A-J25	
Sunday	28/04/2024	1:00 AM	52	50	J24A-J25	Sunday	28/04/2024	6:00 PM	67	62 J25-J26	Monday	29/04/2024	1:00 AM	62	57 J25-J26	
Sunday	28/04/2024	1:00 AM	63	56	J25-J26	Sunday	28/04/2024	6:00 PM	70	70 J26-J27	Monday	29/04/2024	1:00 AM	65	63 J26-J27	
Sunday	28/04/2024	1:00 AM	69	54	J26-J26	Sunday	28/04/2024	6:00 PM	70	70 J27-J28	Monday	29/04/2024	1:00 AM	65	63 J27-J28	
Sunday	28/04/2024	1:00 AM	67	61	J27-J28	Sunday	28/04/2024	6:00 PM	64	56 J28-J29	Monday	29/04/2024	1:00 AM	59	53 J28-J29	
Sunday	28/04/2024	1:00 AM	60	64	J28-J29	Sunday	28/04/2024	6:00 PM	50	48 J29-J29A	Monday	29/04/2024	1:00 AM	48	53 J29-J29A	
Sunday	28/04/2024	1:00 AM	50	52	J29-J29A	Sunday	28/04/2024	6:00 PM	68	70 J29A-J30	Monday	29/04/2024	1:00 AM	68	68 J29A-J30	
Sunday	28/04/2024	1:00 AM	50	52	J29A-J30	Sunday	28/04/2024	6:00 PM	49	48 J30-J31	Monday	29/04/2024	1:00 AM	51	49 J30-J31	
Sunday	28/04/2024	1:00 AM	51	49	J30-J31	Sunday	28/04/2024	6:00 PM	63	61 J31-J32	Monday	29/04/2024	1:00 AM	63	51 J31-J32	
Sunday	28/04/2024	1:00 AM	64	47	J31-J32	Sunday	28/04/2024	6:00 PM	51	54 J32-J33	Monday	29/04/2024	1:00 AM	49	56 J32-J33	
Sunday	28/04/2024	1:00 AM	51	54	J32-J33	Sunday	28/04/2024	6:00 PM	50	48 J33-J34	Monday	29/04/2024	1:00 AM	47	48 J33-J34	
Sunday	28/04/2024	1:00 AM	49	48	J33-J33	Sunday	28/04/2024	6:00 PM	49	48 J34-J35	Monday	29/04/2024	1:00 AM	48	47 J34-J35	
Sunday	28/04/2024	1:00 AM	49	47	J34-J35	Sunday	28/04/2024	6:00 PM	61	50 J35-J35A	Monday	29/04/2024	1:00 AM	56	49 J35-J35A	
Sunday	28/04/2024	1:00 AM	59	59	J35-J35A	Sunday	28/04/2024	6:00 PM	61	50 J35A-J36	Monday	29/04/2024	1:00 AM	62	62 J35A-J36	
Sunday	28/04/2024	1:00 AM	69	68	J35A-J36	Sunday	28/04/2024	6:00 PM	70	70 J35A-J36	Monday	29/04/2024	1:00 AM	67	64 J36-J37	
Sunday	28/04/2024	1:00 AM	68	70	J36-J37	Sunday	28/04/2024	6:00 PM	6	6 J37-J38	Monday	29/04/2024	1:00 AM	67	67 J37-J38	
Sunday	28/04/2024	1:00 AM	69	69	J37-J38	Sunday	28/04/2024	6:00 PM	70	69 J37-J39	Monday	29/04/2024	1:00 AM	69	67 J37-J38	
Sunday	28/04/2024	1:00 AM	70	70	J38-J39	Sunday	28/04/2024	6:00 PM	68	61 J39-J40	Monday	29/04/2024	1:00 AM	65	69 J39-J40	
Sunday	28/04/2024	1:00 AM	67	68	J39-J40	Sunday	28/04/2024	6:00 PM	70	60 J40-J41	Monday	29/04/2024	1:00 AM	67	67 J40-J41	
Sunday	28/04/2024	1:00 AM	66	66	J40-J41	Sunday	28/04/2024	6:00 PM	69	66 J41-J42	Monday	29/04/2024	1:00 AM	69	66 J41-J42	
Sunday	28/04/2024	1:00 AM	59	68	J41-J42	Sunday	28/04/2024	6:00 PM	70	65 J42-J43	Monday	29/04/2024	1:00 AM	68	65 J42-J43	
Sunday	28/04/2024	1:00 AM	57	67	J42-J43/44	Sunday	28/04/2024	6:00 PM	68	62 J43-J44	Monday	29/04/2024	1:00 AM	66	66 J43-J44	
Sunday	28/04/2024	1:00 AM	56	65	J43-J44-J45	Sunday	28/04/2024	6:00 PM	51	58 J44-J45	Monday	29/04/2024	1:00 AM	51	58 J44-J45	
Sunday	28/04/2024	1:00 AM	52	52	J44-J45	Sunday	28/04/2024	6:00 PM	66	48 J45-J46	Monday	29/04/2024	1:00 AM	49	48 J45-J46	
Sunday	28/04/2024	1:00 AM	48	48	J45-J46	Sunday	28/04/2024	6:00 PM	57	50 J46-J47	Monday	29/04/2024	1:00 AM	58	49 J46-J47	
Sunday	28/04/2024	1:00 AM	50	50	J46-J47	Sunday	28/04/2024	6:00 PM	67	61 J47-J48	Monday	29/04/2024	1:00 AM	64	52 J1-J2	
Sunday	28/04/2024	1:00 AM	70	70	J47-J48	Sunday	28/04/2024	6:00 PM	10:00 PM	5	68 J48-J49	Monday	29/04/2024	1:00 AM	67	61 J2-J4
Sunday	28/04/2024	1:00 AM	69	69	J48-J49	Sunday	28/04/2024	6:00 PM	53	48 J49-J50	Monday	29/04/2024	1:00 AM	47	48 J49-J50	
Sunday	28/04/2024	1:00 AM	65	65	J49-J50	Sunday	28/04/2024	6:00 PM	65	69 J50-J51	Monday	29/04/2024	1:00 AM	64	62 J50-J51	
Sunday	28/04/2024	1:00 AM	65	70	J50-J51	Sunday	28/04/2024	6:00 PM	65	62 J51-J5A	Monday	29/04/2024	1:00 AM	62	67 J51-J5A	
Sunday	28/04/2024	1:00 AM	63	63	J51-J5A	Sunday	28/04/2024	6:00 PM	58	62 J51A-J5A	Monday	29/04/2024	1:00 AM	62	62 J51A-J5A	
Sunday	28/04/2024	1:00 AM	63	63	J51A-J5A	Sunday	28/04/2024	6:00 PM	61	69 J51A-J51	Monday	29/04/2024	1:00 AM	65	65 J51A-J51	
Sunday	28/04/2024	1:00 AM	66	62	J51A-J51	Sunday	28/04/2024	6:00 PM	64	61 J51A-J51	Monday	29/04/2024	1:00 AM	62	61 J51A-J51	
Sunday	28/04/2024	1:00 AM	66	62	J51A-J51	Sunday	28/04/2024	6:00 PM	70	60 J51A-J51	Monday	29/04/2024	1:00 AM	66	66 J51A-J51	
Sunday	28/04/2024	1:00 AM	60	68	J51A-J51	Sunday	28/04/2024	6:00 PM	70	68 J51A-J51	Monday	29/04/2024	1:00 AM	66	66 J51A-J51	
Sunday	28/04/2024	1:00 AM	68	68	J51A-J51	Sunday	28/04/2024	6:00 PM	70	66 J51A-J51	Monday	29/04/2024	1:00 AM	66	66 J51A-J51	
Sunday	28/04/2024	1:00 AM	69	68	J51A-J51	Sunday	28/04/2024	6:00 PM	70	66 J51A-J51	Monday	29/04/2024	1:00 AM	67	67 J51A-J51	
Sunday	28/04/2024	1:00 AM	60	68	J51A-J51	Sunday	28/04/2024	6:00 PM	62	66 J51A-J51	Monday	29/04/2024	1:00 AM	59	63 J51A-J51	
Sunday	28/04/2024	1:00 AM	68	68	J51A-J51	Sunday	28/04/2024	6:00 PM	68	66 J51A-J51						

Monday 29/04/2024	4:30 PM	66	52 J1-J2	Tuesday 30/04/2024	1:00 AM	62	68 J1-J2	Tuesday 30/04/2024	5:00 PM	62	61 J1-J2
Monday 29/04/2024	4:00 PM	70	56 J2-J4	Tuesday 30/04/2024	1:00 AM	61	67 J2-J4	Tuesday 30/04/2024	5:00 PM	68	69 J2-J4
Monday 29/04/2024	4:00 PM	69	63 J4-J5	Tuesday 30/04/2024	1:00 AM	59	70 J4-J5	Tuesday 30/04/2024	5:00 PM	69	66 J4-J5
Monday 29/04/2024	4:00 PM	66	63 J5-J6	Tuesday 30/04/2024	1:00 AM	65	61 J5-J6	Tuesday 30/04/2024	5:00 PM	68	63 J5-J6
Monday 29/04/2024	4:00 PM	63	66 J6-J6A	Tuesday 30/04/2024	1:00 AM	64	58 J6-J6A	Tuesday 30/04/2024	5:00 PM	64	68 J6-J6A
Monday 29/04/2024	4:00 PM	59	56 J6A-J7	Tuesday 30/04/2024	1:00 AM	63	62 J6A-J7	Tuesday 30/04/2024	5:00 PM	67	64 J6A-J7
Monday 29/04/2024	4:00 PM	53	54 J7-J8	Tuesday 30/04/2024	1:00 AM	57	56 J7-J8	Tuesday 30/04/2024	5:00 PM	54	57 J7-J8
Monday 29/04/2024	4:00 PM	61	59 J8-J9	Tuesday 30/04/2024	1:00 AM	69	53 J8-J9	Tuesday 30/04/2024	5:00 PM	69	66 J8-J9
Monday 29/04/2024	4:00 PM	55	59 J9-J10	Tuesday 30/04/2024	1:00 AM	59	10 J9-J10	Tuesday 30/04/2024	5:00 PM	62	66 J9-J10
Monday 29/04/2024	4:00 PM	47	38 J10-J11	Tuesday 30/04/2024	1:00 AM	48	45 J10-J11	Tuesday 30/04/2024	5:00 PM	49	51 J10-J11
Monday 29/04/2024	4:00 PM	50	29 J11-J11A	Tuesday 30/04/2024	1:00 AM	48	48 J11-J11A	Tuesday 30/04/2024	5:00 PM	48	48 J11-J11A
Monday 29/04/2024	4:00 PM	52	45 J11A-J12	Tuesday 30/04/2024	1:00 AM	48	49 J11a-J12	Tuesday 30/04/2024	5:00 PM	49	48 J11a-J12
Monday 29/04/2024	4:00 PM	52	49 J12-J13	Tuesday 30/04/2024	1:00 AM	62	49 J12-J13	Tuesday 30/04/2024	5:00 PM	65	48 J12-J13
Monday 29/04/2024	4:00 PM	64	57 J13-J14	Tuesday 30/04/2024	1:00 AM	63	56 J13-J14	Tuesday 30/04/2024	5:00 PM	63	53 J13-J14
Monday 29/04/2024	4:00 PM	62	66 J14-J15	Tuesday 30/04/2024	1:00 AM	60	57 J14-J15	Tuesday 30/04/2024	5:00 PM	60	69 J14-J15
Monday 29/04/2024	4:00 PM	68	62 J15-J15A	Tuesday 30/04/2024	1:00 AM	59	57 J15-J15A	Tuesday 30/04/2024	5:00 PM	63	70 J15-J15A
Monday 29/04/2024	4:00 PM	65	65 J15A-J16	Tuesday 30/04/2024	1:00 AM	62	59 J15a-J16	Tuesday 30/04/2024	5:00 PM	65	69 J15a-J16
Monday 29/04/2024	4:00 PM	66	66 J16-J17	Tuesday 30/04/2024	1:00 AM	55	43 J16-J17	Tuesday 30/04/2024	5:00 PM	68	68 J16-17
Monday 29/04/2024	4:00 PM	66	66 J17-J18	Tuesday 30/04/2024	1:00 AM	52	60 J17-J18	Tuesday 30/04/2024	5:00 PM	65	58 J17-J18
Monday 29/04/2024	4:00 PM	64	56 J18-J19	Tuesday 30/04/2024	1:00 AM	62	51 J18-J19	Tuesday 30/04/2024	5:00 PM	58	58 J18-J19
Monday 29/04/2024	4:00 PM	63	62 J19-J20	Tuesday 30/04/2024	1:00 AM	61	61 J19-J20	Tuesday 30/04/2024	5:00 PM	70	70 J19-J20
Monday 29/04/2024	4:00 PM	64	64 J20-J21	Tuesday 30/04/2024	1:00 AM	64	69 J20-J21	Tuesday 30/04/2024	5:00 PM	70	63 J20-J21
Monday 29/04/2024	4:00 PM	61	59 J21-J21A	Tuesday 30/04/2024	1:00 AM	54	67 J21-J21A	Tuesday 30/04/2024	5:00 PM	63	66 J21-J21A
Monday 29/04/2024	4:00 PM	63	66 J21A-J22	Tuesday 30/04/2024	1:00 AM	38	60 J21A-J22	Tuesday 30/04/2024	5:00 PM	68	63 J21A-J22
Monday 29/04/2024	4:00 PM	63	66 J22-J23	Tuesday 30/04/2024	1:00 AM	64	53 J22-J23	Tuesday 30/04/2024	5:00 PM	69	58 J22-J23
Monday 29/04/2024	4:00 PM	64	65 J23-J23A	Tuesday 30/04/2024	1:00 AM	67	55 J23-J23A	Tuesday 30/04/2024	5:00 PM	68	70 J23-J23A
Monday 29/04/2024	4:00 PM	60	58 J23A-J24	Tuesday 30/04/2024	1:00 AM	59	52 J23a-J24	Tuesday 30/04/2024	5:00 PM	62	62 J23a-J24
Monday 29/04/2024	4:00 PM	50	50 J24-J24A	Tuesday 30/04/2024	1:00 AM	52	46 J24-J24A	Tuesday 30/04/2024	5:00 PM	55	50 J24-J24A
Monday 29/04/2024	4:00 PM	49	48 J24A-J25	Tuesday 30/04/2024	1:00 AM	50	49 J24a-J25	Tuesday 30/04/2024	5:00 PM	56	49 J24a-J25
Monday 29/04/2024	4:00 PM	62	59 J25-J26	Tuesday 30/04/2024	1:00 AM	66	60 J25-J26	Tuesday 30/04/2024	5:00 PM	65	59 J25-J26
Monday 29/04/2024	4:00 PM	66	68 J26-J27	Tuesday 30/04/2024	1:00 AM	70	68 J26-J27	Tuesday 30/04/2024	5:00 PM	67	70 J26-J27
Monday 29/04/2024	4:00 PM	66	63 J27-J28	Tuesday 30/04/2024	1:00 AM	64	67 J27-J28	Tuesday 30/04/2024	5:00 PM	70	67 J27-J28
Monday 29/04/2024	4:00 PM	57	60 J28-J29	Tuesday 30/04/2024	1:00 AM	47	58 J28-J29	Tuesday 30/04/2024	5:00 PM	64	64 J28-J29
Monday 29/04/2024	4:00 PM	49	54 J29-J29A	Tuesday 30/04/2024	1:00 AM	53	50 J29-J29A	Tuesday 30/04/2024	5:00 PM	51	50 J29-J29A
Monday 29/04/2024	4:00 PM	50	51 J30-J31	Tuesday 30/04/2024	1:00 AM	50	49 J30-J31	Tuesday 30/04/2024	5:00 PM	51	49 J30-31
Monday 29/04/2024	4:00 PM	63	53 J31-J32	Tuesday 30/04/2024	1:00 AM	60	51 J31-J32	Tuesday 30/04/2024	5:00 PM	66	52 J31-J32
Monday 29/04/2024	4:00 PM	50	50 J32-J33	Tuesday 30/04/2024	1:00 AM	50	49 J32-J33	Tuesday 30/04/2024	5:00 PM	51	50 J32-J33
Monday 29/04/2024	4:00 PM	50	57 J32-J33	Tuesday 30/04/2024	1:00 AM	50	53 J32-J33	Tuesday 30/04/2024	5:00 PM	51	57 J32-J33
Monday 29/04/2024	4:00 PM	49	49 J33-J34	Tuesday 30/04/2024	1:00 AM	50	49 J33-J34	Tuesday 30/04/2024	5:00 PM	48	51 J33-J34
Monday 29/04/2024	4:00 PM	50	48 J34-J35	Tuesday 30/04/2024	1:00 AM	47	49 J34-J35	Tuesday 30/04/2024	5:00 PM	48	49 J34-J35
Monday 29/04/2024	4:00 PM	59	48 J35-J35A	Tuesday 30/04/2024	1:00 AM	50	48 J35-J35A	Tuesday 30/04/2024	5:00 PM	65	50 J35-J35A
Monday 29/04/2024	4:00 PM	66	58 J35A-J36	Tuesday 30/04/2024	1:00 AM	60	50 J35A-J36	Tuesday 30/04/2024	5:00 PM	69	65 J35A-J36
Monday 29/04/2024	4:00 PM	66	64 J36-J37	Tuesday 30/04/2024	1:00 AM	69	55 J36-J37	Tuesday 30/04/2024	5:00 PM	70	69 J36-J37
Monday 29/04/2024	4:00 PM	70	64 J37-J38	Tuesday 30/04/2024	1:00 AM	70	66 J37-J38	Tuesday 30/04/2024	5:00 PM	70	68 J37-J38
Monday 29/04/2024	4:00 PM	69	64 J38-J39	Tuesday 30/04/2024	1:00 AM	65	68 J38-J39	Tuesday 30/04/2024	5:00 PM	70	67 J38-J39
Monday 29/04/2024	4:00 PM	67	61 J39-J40	Tuesday 30/04/2024	1:00 AM	67	57 J39-J40	Tuesday 30/04/2024	5:00 PM	65	69 J39-J40
Monday 29/04/2024	4:00 PM	66	66 J40-J41	Tuesday 30/04/2024	1:00 AM	69	50 J40-J41	Tuesday 30/04/2024	5:00 PM	66	70 J40-J41
Monday 29/04/2024	4:00 PM	66	64 J41-J42	Tuesday 30/04/2024	1:00 AM	66	43 J41-J42	Tuesday 30/04/2024	5:00 PM	65	67 J41-J42
Monday 29/04/2024	4:00 PM	68	66 J42-J43/44	Tuesday 30/04/2024	1:00 AM	61	55 J42-J43/44	Tuesday 30/04/2024	5:00 PM	65	70 J42-J43/44
Monday 29/04/2024	4:00 PM	68	65 J43/44-J45	Tuesday 30/04/2024	1:00 AM	57	65 J43/44-J45	Tuesday 30/04/2024	5:00 PM	65	70 J43/44-J45
Monday 29/04/2024	4:00 PM	50	57 J45-J46	Tuesday 30/04/2024	1:00 AM	49	59 J45-J46	Tuesday 30/04/2024	5:00 PM	53	63 J45-J46
Monday 29/04/2024	4:00 PM	48	47 J46-J47	Tuesday 30/04/2024	1:00 AM	47	47 J46-J47	Tuesday 30/04/2024	5:00 PM	49	49 J46-J47
Monday 29/04/2024	4:00 PM	56	49 J47-J48	Tuesday 30/04/2024	1:00 AM	55	50 J47-J48	Tuesday 30/04/2024	5:00 PM	59	49 J47-J48
Monday 29/04/2024	9:00 PM	70	61 J1-J2	Tuesday 30/04/2024	9:00 AM	70	61 J1-J2	Tuesday 30/04/2024	8:00 PM	70	63 J1-J2
Monday 29/04/2024	9:00 PM	64	69 J2-J4	Tuesday 30/04/2024	9:00 AM	64	65 J4-J5	Tuesday 30/04/2024	8:00 PM	70	70 J4-J5
Monday 29/04/2024	9:00 PM	68	69 J5-J6	Tuesday 30/04/2024	9:00 AM	69	65 J5-J6	Tuesday 30/04/2024	8:00 PM	68	70 J5-J6
Monday 29/04/2024	9:00 PM	63	70 J6-J6A	Tuesday 30/04/2024	9:00 AM	66	69 J6-J6A	Tuesday 30/04/2024	8:00 PM	70	70 J6-J6A
Monday 29/04/2024	9:00 PM	60	60 J6A-J7	Tuesday 30/04/2024	9:00 AM	66	65 J6a-J7	Tuesday 30/04/2024	8:00 PM	58	62 J6a-J7
Monday 29/04/2024	9:00 PM	57	57 J7-J8	Tuesday 30/04/2024	9:00 AM	55	57 J7-J8	Tuesday 30/04/2024	8:00 PM	59	59 J7-J8
Monday 29/04/2024	9:00 PM	62	58 J8-J9	Tuesday 30/04/2024	9:00 AM	66	68 J8-J9	Tuesday 30/04/2024	8:00 PM	62	64 J8-J9
Monday 29/04/2024	9:00 PM	59	56 J9-J10	Tuesday 30/04/2024	9:00 AM	60	65 J9-J10	Tuesday 30/04/2024	8:00 PM	59	64 J9-J10
Monday 29/04/2024	9:00 PM	50	48 J10-J11	Tuesday 30/04/2024	9:00 AM	49	50 J10-J11	Tuesday 30/04/2024	8:00 PM	49	49 J10-J11
Monday 29/04/2024	9:00 PM	50	47 J11-J11A	Tuesday 30/04/2024	9:00 AM	48	47 J11-J11A	Tuesday 30/04/2024	8:00 PM	50	48 J11-J11A
Monday 29/04/2024	9:00 PM	50	48 J11A-J12	Tuesday 30/04/2024	9:00 AM	49	47 J11A-J12	Tuesday 30/04/2024	8:00 PM	49	48 J11A-J12
Monday 29/04/2024	9:00 PM	28	48 J12-J13	Tuesday 30/04/2024	9:00 AM	66	69 J16-J16A	Tuesday 30/04/2024	8:00 PM	70	70 J16-J16A
Monday 29/04/2024	9:00 PM	68	56 J16-J16A	Tuesday 30/04/2024	9:00 AM	63	66 J16a-J16	Tuesday 30/04/2024	8:00 PM	58	62 J16a-J16
Monday 29/04/2024	9:00 PM	60	60 J16A-J17	Tuesday 30/04/2024	9:00 AM	66	65 J16-J17	Tuesday 30/04/2024	8:00 PM	58	62 J16-J17
Monday 29/04/2024	9:00 PM	57	57 J17-J18	Tuesday 30/04/2024	9:00 AM	63	57 J17-J18	Tuesday 30/04/2024	8:00 PM	62	66 J17-J18
Monday 29/04/2024	9:00 PM	16	53 J18-J20	Tuesday 30/04/2024	9:00 AM	70	57 J19-J20	Tuesday 30/04/2024	8:00 PM	70	60 J19-J20
Monday 29/04/2024	9:00 PM	4	3 J20-J21	Tuesday 30/04/2024	9:00 AM	70	67 J20-J21	Tuesday 30/04/2024	8:00 PM	70	66 J20-J21
Monday 29/04/2024	9:00 PM	67	43 J21-J21A	Tuesday 30/04/2024	9:00 AM	64	70 J14-J15	Tuesday 30/04/2024	8:00 PM	69	70 J21-J21A
Monday 29/04/2024	9:00 PM	66	56 J21A-J22	Tuesday 30/04/2024	9:00 AM	59	64 J21A-J22	Tuesday 30/04/2024	8:00 PM	70	61 J21A-J22
Monday 29/04/2024	9:00 PM	67	54 J22-J23A	Tuesday 30/04/2024	9:00 AM	60	67 J22-J23A	Tuesday 30/04/2024	8:00 PM	63	67 J22-J23A
Monday 29/04/2024	9:00 PM	58	55 J23A-J24	Tuesday 30/04/2024	9:00 AM	59	62 J23A-J24	Tuesday 30/04/2024	8:00 PM	60	58 J23A-J24
Monday 29/04/2024	9:00 PM	50	44 J24-J24A	Tuesday 30/04/2024	9:00 AM	52	50 J24-J24A	Tuesday 30/04/2024	8:00 PM	50	51 J24-J24A
Monday 29/04/2024	9:00 PM	49	37 J24A-J25	Tuesday 30/04/2024	9:00 AM	52	50 J24A-J25	Tuesday 30/04/2024	8:00 PM	49	50 J24A-J25
Monday 29											

Wednes	1/5/2024	10:00 AM	57	55 J2-J4	Wednesday	1/5/2024	4:30 PM	70	68 J1-J2	Thurs day	2/5/2024	1:00 AM	62	63 J1-J2
Wednes	1/5/2024	1:00 AM	57	55 J2-J4	Wednesday	1/5/2024	4:00 PM	70	70 J2-J4	Thurs day	2/5/2024	1:00 AM	60	64 J2-J4
Wednes	1/5/2024	1:00 AM	65	54 J4-J5	Wednesday	1/5/2024	4:00 PM	70	70 J4-J5	Thurs day	2/5/2024	1:00 AM	57	91 J4-J5
Wednes	1/5/2024	1:00 AM	66	55 J5-J6	Wednesday	1/5/2024	4:00 PM	63	68 J5-J6	Thurs day	2/5/2024	1:00 AM	55	66 J5-J6
Wednes	1/5/2024	1:00 AM	62	58 J6-J6A	Wednesday	1/5/2024	4:00 PM	63	70 J6-J6A	Thurs day	2/5/2024	1:00 AM	46	41 J6-J6A
Wednes	1/5/2024	1:00 AM	61	55 J6A-J7	Wednesday	1/5/2024	4:00 PM	60	63 J6A-J7	Thurs day	2/5/2024	1:00 AM	49	33 J6A-J7
Wednes	1/5/2024	1:00 AM	55	56 J7-J8	Wednesday	1/5/2024	4:00 PM	59	51 J7-J8	Thurs day	2/5/2024	1:00 AM	53	53 J7-J8
Wednes	1/5/2024	1:00 AM	55	55 J8-J9	Wednesday	1/5/2024	4:00 PM	59	63 J8-J9	Thurs day	2/5/2024	1:00 AM	57	22 J8-J9
Wednes	1/5/2024	1:00 AM	52	47 J9-J10	Wednesday	1/5/2024	4:00 PM	57	63 J9-J10	Thurs day	2/5/2024	1:00 AM	55	60 J9-J10
Wednes	1/5/2024	1:00 AM	49	51 J10-J11	Wednesday	1/5/2024	4:00 PM	46	50 J10-J11	Thurs day	2/5/2024	1:00 AM	51	51 J10-J11
Wednes	1/5/2024	1:00 AM	48	50 J11-J11A	Wednesday	1/5/2024	4:00 PM	46	47 J11-J11A	Thurs day	2/5/2024	1:00 AM	51	49 J11-J11A
Wednes	1/5/2024	1:00 AM	53	51 J11A-J12	Wednesday	1/5/2024	4:00 PM	48	47 J11A-J12	Thurs day	2/5/2024	1:00 AM	50	49 J11A-J12
Wednes	1/5/2024	1:00 AM	53	52 J12-J11	Wednesday	1/5/2024	4:00 PM	46	49 J12-J11	Thurs day	2/5/2024	1:00 AM	49	50 J12-J11
Wednes	1/5/2024	2: AM	67	53 J13-J14	Wednesday	1/5/2024	4:00 PM	59	55 J13-J14	Thurs day	2/5/2024	1:00 AM	67	52 J13-J14
Wednes	1/5/2024	1:00 AM	60	48 J14-J15	Wednesday	1/5/2024	4:00 PM	63	67 J14-J15	Thurs day	2/5/2024	1:00 AM	66	62 J14-J15
Wednes	1/5/2024	1:00 AM	61	63 J15-J15A	Wednesday	1/5/2024	4:00 PM	63	66 J15-J15A	Thurs day	2/5/2024	1:00 AM	56	61 J15-J15A
Wednes	1/5/2024	1:00 AM	65	62 J15A-J16	Wednesday	1/5/2024	4:00 PM	62	65 J15A-J16	Thurs day	2/5/2024	1:00 AM	55	62 J15A-J16
Wednes	1/5/2024	1:00 AM	70	52 J16-J17	Wednesday	1/5/2024	4:00 PM	62	67 J16-J17	Thurs day	2/5/2024	1:00 AM	56	55 J16-J17
Wednes	1/5/2024	1:00 AM	46	53 J17-J18	Wednesday	1/5/2024	4:00 PM	64	55 J17-J18	Thurs day	2/5/2024	1:00 AM	60	56 J17-J18
Wednes	1/5/2024	1:00 AM	54	54 J18-J19	Wednesday	1/5/2024	4:00 PM	62	58 J18-J19	Thurs day	2/5/2024	1:00 AM	61	58 J18-J19
Wednes	1/5/2024	1:00 AM	70	58 J19-J20	Wednesday	1/5/2024	4:00 PM	64	68 J19-J20	Thurs day	2/5/2024	1:00 AM	61	64 J19-J20
Wednes	1/5/2024	1:00 AM	57	54 J20-J21	Wednesday	1/5/2024	4:00 PM	67	66 J20-J21	Thurs day	2/5/2024	1:00 AM	58	70 J20-J21
Wednes	1/5/2024	1:00 AM	58	55 J21-J21A	Wednesday	1/5/2024	4:00 PM	59	61 J21-J21A	Thurs day	2/5/2024	1:00 AM	60	70 J21-J21A
Wednes	1/5/2024	1:00 AM	58	58 J21A-J22	Wednesday	1/5/2024	4:00 PM	67	69 J21A-J22	Thurs day	2/5/2024	1:00 AM	55	70 J21A-J22
Wednes	1/5/2024	1:00 AM	54	53 J22-J23	Wednesday	1/5/2024	4:00 PM	70	68 J22-J23	Thurs day	2/5/2024	1:00 AM	62	70 J22-J23
Wednes	1/5/2024	1:00 AM	55	63 J23-J23A	Wednesday	1/5/2024	4:00 PM	64	66 J23-J23A	Thurs day	2/5/2024	1:00 AM	65	70 J23-J23A
Wednes	1/5/2024	1:00 AM	53	56 J23A-J24	Wednesday	1/5/2024	4:00 PM	21	60 J23A-J24	Thurs day	2/5/2024	1:00 AM	59	57 J23A-J24
Wednes	1/5/2024	1:00 AM	48	49 J24-J24A	Wednesday	1/5/2024	4:00 PM	15	49 J24-J24A	Thurs day	2/5/2024	1:00 AM	55	44 J24-J24A
Wednes	1/5/2024	1:00 AM	49	50 J24A-J25	Wednesday	1/5/2024	4:00 PM	43	40 J24A-J25	Thurs day	2/5/2024	1:00 AM	49	48 J24A-J25
Wednes	1/5/2024	2: AM	57	58 J25-J26	Wednesday	1/5/2024	4:00 PM	61	51 J25-J26	Thurs day	2/5/2024	1:00 AM	62	53 J25-J26
Wednes	1/5/2024	1:00 AM	57	63 J26-J27	Wednesday	1/5/2024	4:00 PM	65	69 J26-J27	Thurs day	2/5/2024	1:00 AM	65	63 J26-J27
Wednes	1/5/2024	1:00 AM	57	61 J27-J28	Wednesday	1/5/2024	4:00 PM	65	63 J27-J28	Thurs day	2/5/2024	1:00 AM	51	30 J27-J28
Wednes	1/5/2024	1:00 AM	46	61 J28-J29	Wednesday	1/5/2024	4:00 PM	48	60 J28-J29	Thurs day	2/5/2024	1:00 AM	55	58 J28-J29
Wednes	1/5/2024	1:00 AM	50	51 J29-J29A	Wednesday	1/5/2024	4:00 PM	34	48 J29-J29A	Thurs day	2/5/2024	1:00 AM	52	53 J29-J29A
Wednes	1/5/2024	1:00 AM	48	50 J29A-J30	Wednesday	1/5/2024	4:00 PM	33	47 J29A-J30	Thurs day	2/5/2024	1:00 AM	49	51 J29A-J30
Wednes	1/5/2024	1:00 AM	50	46 J30-J31	Wednesday	1/5/2024	4:00 PM	49	57 J30-J31	Thurs day	2/5/2024	1:00 AM	49	49 J30-J31
Wednes	1/5/2024	1:00 AM	55	51 J31-J32	Wednesday	1/5/2024	4:00 PM	61	50 J31-J32	Thurs day	2/5/2024	1:00 AM	60	48 J31-J32
Wednes	1/5/2024	1:00 AM	49	55 J32-J33	Wednesday	1/5/2024	4:00 PM	49	46 J32-J33	Thurs day	2/5/2024	1:00 AM	50	51 J32-J33
Wednes	1/5/2024	1:00 AM	50	53 J33-J34	Wednesday	1/5/2024	4:00 PM	48	17 J33-J34	Thurs day	2/5/2024	1:00 AM	51	50 J33-J34
Wednes	1/5/2024	1:00 AM	50	50 J34-J35	Wednesday	1/5/2024	4:00 PM	46	45 J34-J35	Thurs day	2/5/2024	1:00 AM	51	49 J34-J35
Wednes	1/5/2024	1:00 AM	62	52 J35-J35A	Wednesday	1/5/2024	4:00 PM	61	47 J35-J35A	Thurs day	2/5/2024	1:00 AM	61	50 J35-J35A
Wednes	1/5/2024	1:00 AM	63	54 J35A-J36	Wednesday	1/5/2024	4:00 PM	66	57 J35A-J36	Thurs day	2/5/2024	1:00 AM	68	65 J35A-J36
Wednes	1/5/2024	1:00 AM	63	63 J36-J37	Wednesday	1/5/2024	4:00 PM	62	66 J36-J37	Thurs day	2/5/2024	1:00 AM	70	68 J36-J37
Wednes	1/5/2024	1:00 AM	68	70 J37-J38	Wednesday	1/5/2024	4:00 PM	65	68 J37-J38	Thurs day	2/5/2024	1:00 AM	70	67 J37-J38
Wednes	1/5/2024	1:00 AM	70	70 J38-J39	Wednesday	1/5/2024	4:00 PM	66	66 J38-J39	Thurs day	2/5/2024	1:00 AM	70	68 J38-J39
Wednes	1/5/2024	1:00 AM	64	67 J39-J40	Wednesday	1/5/2024	4:00 PM	65	66 J39-J40	Thurs day	2/5/2024	1:00 AM	64	63 J39-J40
Wednes	1/5/2024	2: AM	57	64 J40-J41	Wednesday	1/5/2024	4:00 PM	67	67 J40-J41	Thurs day	2/5/2024	1:00 AM	57	52 J40-J41
Wednes	1/5/2024	1:00 AM	63	51 J41-J42	Wednesday	1/5/2024	4:00 PM	67	67 J41-J42	Thurs day	2/5/2024	1:00 AM	59	66 J41-J42
Wednes	1/5/2024	1:00 AM	66	56 J42-J43/44	Wednesday	1/5/2024	4:00 PM	65	64 J42-J43/44	Thurs day	2/5/2024	1:00 AM	59	67 J42-J43/44
Wednes	1/5/2024	1:00 AM	67	62 J43/44-J45	Wednesday	1/5/2024	4:00 PM	67	62 J43/44-J45	Thurs day	2/5/2024	1:00 AM	63	64 J43/44-J45
Wednes	1/5/2024	1:00 AM	49	61 J45-J46	Wednesday	1/5/2024	4:00 PM	50	54 J45-J46	Thurs day	2/5/2024	1:00 AM	52	61 J45-J46
Wednes	1/5/2024	1:00 AM	50	50 J46-J47	Wednesday	1/5/2024	4:00 PM	54	54 J46-J47	Thurs day	2/5/2024	1:00 AM	51	49 J46-J47
Wednes	1/5/2024	10:00 AM	65	61 J1-J2	Wednesday	1/5/2024	8:00 PM	65	64 J1-J2	Thurs day	2/5/2024	1:00 AM	70	62 J1-J2
Wednes	1/5/2024	10:00 AM	68	70 J2-J3	Wednesday	1/5/2024	8:00 PM	70	69 J2-J3	Thurs day	2/5/2024	1:00 AM	68	70 J2-J3
Wednes	1/5/2024	10:00 AM	70	70 J3-J4	Wednesday	1/5/2024	8:00 PM	64	70 J3-J4	Thurs day	2/5/2024	1:00 AM	62	70 J3-J4
Wednes	1/5/2024	10:00 AM	68	70 J4-J5	Wednesday	1/5/2024	8:00 PM	65	68 J4-J5	Thurs day	2/5/2024	1:00 AM	62	70 J4-J5
Wednes	1/5/2024	10:00 AM	60	69 J5-J6	Wednesday	1/5/2024	8:00 PM	66	68 J5-J6	Thurs day	2/5/2024	1:00 AM	58	58 J5-J6
Wednes	1/5/2024	10:00 AM	69	69 J6-J7	Wednesday	1/5/2024	8:00 PM	62	58 J6-J7	Thurs day	2/5/2024	1:00 AM	61	54 J6-J7
Wednes	1/5/2024	10:00 AM	65	63 J15-J15A	Wednesday	1/5/2024	8:00 PM	61	63 J15-J15A	Thurs day	2/5/2024	1:00 AM	63	63 J15-J15A
Wednes	1/5/2024	10:00 AM	69	64 J16-J16	Wednesday	1/5/2024	8:00 PM	52	68 J16-J17	Thurs day	2/5/2024	1:00 AM	52	53 J10-J11
Wednes	1/5/2024	10:00 AM	52	50 J11-J11A	Wednesday	1/5/2024	8:00 PM	53	50 J11-J11A	Thurs day	2/5/2024	1:00 AM	50	51 J11-J11A
Wednes	1/5/2024	10:00 AM	61	61 J12-J13	Wednesday	1/5/2024	8:00 PM	50	51 J12-J13	Thurs day	2/5/2024	1:00 AM	52	52 J12-J13
Wednes	1/5/2024	10:00 AM	65	69 J13-J14	Wednesday	1/5/2024	8:00 PM	66	58 J13-J14	Thurs day	2/5/2024	1:00 AM	61	59 J13-J14
Wednes	1/5/2024	10:00 AM	69	63 J14-J15	Wednesday	1/5/2024	8:00 PM	62	58 J14-J15	Thurs day	2/5/2024	1:00 AM	65	65 J14-J15
Wednes	1/5/2024	10:00 AM	65	63 J15-J15A	Wednesday	1/5/2024	8:00 PM	61	63 J15-J15A	Thurs day	2/5/2024	1:00 AM	63	64 J15A-J16
Wednes	1/5/2024	10:00 AM	69	64 J16-J17	Wednesday	1/5/2024	8:00 PM	66	68 J16-J17	Thurs day	2/5/2024	1:00 AM	65	60 J16-J17
Wednes	1/5/2024	10:00 AM	67	68 J17-J18	Wednesday	1/5/2024	8:00 PM	67	62 J17-J18	Thurs day	2/5/2024	1:00 AM	65	57 J17-J18
Wednes	1/5/2024	10:00 AM	70	69 J19-J20	Wednesday	1/5/2024	8:00 PM	68	66 J19-J20	Thurs day	2/5/2024	1:00 AM	69	65 J19-J20
Wednes	1/5/2024	10:00 AM	64	64 J20-J21	Wednesday	1/5/2024	8:00 PM	70	68 J20-J21	Thurs day	2/5/2024	1:00 AM	66	62 J20-J21
Wednes	1/5/2024	10:00 AM	64	64 J21-J21A	Wednesday	1/5/2024	8:00 PM	66	65 J21-J21A	Thurs day	2/5/2024	1:00 AM	58	66 J21-J21A
Wednes	1/5/2024	10:00 AM	67	70 J21A-J22	Wednesday	1/5/2024	8:00 PM	70	70 J21A-J22	Thurs day	2/5/2024	1:00 AM	63	70 J21A-J22
Wednes	1/5/2024	10:00 AM	62	63 J22-J23	Wednesday	1/5/2024	8:							

Thursday	2/5/2024	5:45 PM	65	58 J1-J2	Friday	3/5/2024	1:00 AM	67	61 J1-J2	Friday	3/5/2024	3:00 PM	66	53 J1-J2
Thursday	2/5/2024	5:00 PM	70	65 J2-J4	Friday	3/5/2024	1:00 AM	68	66 J2-J4	Friday	3/5/2024	3:00 PM	70	61 J2-J4
Thursday	2/5/2024	5:00 PM	70	67 J4-J5	Friday	3/5/2024	1:00 AM	70	64 J4-J5	Friday	3/5/2024	3:00 PM	69	68 J4-J5
Thursday	2/5/2024	5:00 PM	64	68 J5-J6	Friday	3/5/2024	1:00 AM	70	70 J5-J6	Friday	3/5/2024	3:00 PM	64	68 J5-J6
Thursday	2/5/2024	5:00 PM	42	70 J6-J6A	Friday	3/5/2024	1:00 AM	65	70 J6-J6A	Friday	3/5/2024	3:00 PM	34	70 J6-J6A
Thursday	2/5/2024	5:00 PM	43	61 J6A-J7	Friday	3/5/2024	1:00 AM	62	63 J6A-J7	Friday	3/5/2024	3:00 PM	35	63 J6A-J7
Thursday	2/5/2024	5:00 PM	42	58 J7-J8	Friday	3/5/2024	1:00 AM	61	57 J7-J8	Friday	3/5/2024	3:00 PM	44	50 J7-J8
Thursday	2/5/2024	5:00 PM	31	63 J8-J9	Friday	3/5/2024	1:00 AM	63	66 J8-J9	Friday	3/5/2024	3:00 PM	28	61 J8-J9
Thursday	2/5/2024	5:00 PM	17	62 J9-J10	Friday	3/5/2024	1:00 AM	57	65 J9-J10	Friday	3/5/2024	3:00 PM	16	62 J9-J10
Thursday	2/5/2024	5:00 PM	35	43 J10-J11	Friday	3/5/2024	1:00 AM	50	50 J10-J11	Friday	3/5/2024	3:00 PM	27	48 J10-J11
Thursday	2/5/2024	5:00 PM	46	37 J11-J11A	Friday	3/5/2024	1:00 AM	49	48 J11-J11A	Friday	3/5/2024	3:00 PM	39	37 J11-J11A
Thursday	2/5/2024	5:00 PM	49	48 J11A-J12	Friday	3/5/2024	1:00 AM	62	61 J11A-J12	Friday	3/5/2024	3:00 PM	40	28 J11A-J12
Thursday	2/5/2024	5:00 PM	48	53 J12-J13	Friday	3/5/2024	1:00 AM	69	59 J12-J13	Friday	3/5/2024	3:00 PM	20	49 J12-J13
Thursday	2/5/2024	5:00 PM	63	62 J13-J14	Friday	3/5/2024	1:00 AM	68	62 J13-J14	Friday	3/5/2024	3:00 PM	49	57 J13-J14
Thursday	2/5/2024	5:00 PM	67	70 J14-J15	Friday	3/5/2024	1:00 AM	69	58 J14-J15	Friday	3/5/2024	3:00 PM	63	62 J14-J15
Thursday	2/5/2024	5:00 PM	69	64 J15-J15A	Friday	3/5/2024	1:00 AM	70	65 J15-J15A	Friday	3/5/2024	3:00 PM	63	61 J15-J15A
Thursday	2/5/2024	5:00 PM	69	64 J15A-J16	Friday	3/5/2024	1:00 AM	65	65 J15A-J16	Friday	3/5/2024	3:00 PM	62	51 J15A-J16
Thursday	2/5/2024	5:00 PM	67	62 J16-J17	Friday	3/5/2024	1:00 AM	64	52 J16-J17	Friday	3/5/2024	3:00 PM	59	51 J16-J17
Thursday	2/5/2024	5:00 PM	68	60 J17-J18	Friday	3/5/2024	1:00 AM	65	63 J17-J18	Friday	3/5/2024	3:00 PM	57	58 J17-J18
Thursday	2/5/2024	5:00 PM	64	65 J18-J19	Friday	3/5/2024	1:00 AM	67	68 J18-J19	Friday	3/5/2024	3:00 PM	53	59 J18-J19
Thursday	2/5/2024	5:00 PM	68	65 J19-J20	Friday	3/5/2024	1:00 AM	69	61 J19-J20	Friday	3/5/2024	3:00 PM	61	66 J19-J20
Thursday	2/5/2024	5:00 PM	70	70 J20-J21	Friday	3/5/2024	1:00 AM	70	61 J20-J21	Friday	3/5/2024	3:00 PM	43	64 J20-J21
Thursday	2/5/2024	5:00 PM	42	61 J21-J21A	Friday	3/5/2024	1:00 AM	70	62 J21-J21A	Friday	3/5/2024	3:00 PM	35	28 J21-J21A
Thursday	2/5/2024	5:00 PM	67	69 J21A-J22	Friday	3/5/2024	1:00 AM	70	61 J21A-J22	Friday	3/5/2024	3:00 PM	11	39 J21A-J22
Thursday	2/5/2024	5:00 PM	40	66 J22-J23	Friday	3/5/2024	1:00 AM	70	62 J22-J23	Friday	3/5/2024	3:00 PM	59	48 J22-J23
Thursday	2/5/2024	5:00 PM	16	66 J23-J23A	Friday	3/5/2024	1:00 AM	70	68 J23-J23A	Friday	3/5/2024	3:00 PM	66	62 J23-J23A
Thursday	2/5/2024	5:00 PM	11	58 J23A-J24	Friday	3/5/2024	1:00 AM	63	63 J23A-J24	Friday	3/5/2024	3:00 PM	52	53 J23A-J24
Thursday	2/5/2024	5:00 PM	12	49 J24A-J24A	Friday	3/5/2024	1:00 AM	50	49 J24A-J24A	Friday	3/5/2024	3:00 PM	23	43 J24A-J24A
Thursday	2/5/2024	5:00 PM	45	48 J24A-J25	Friday	3/5/2024	1:00 AM	51	50 J24A-J25	Friday	3/5/2024	3:00 PM	44	48 J24A-J25
Thursday	2/5/2024	5:00 PM	62	59 J25-J26	Friday	3/5/2024	1:00 AM	63	53 J25-J26	Friday	3/5/2024	3:00 PM	62	58 J25-J26
Thursday	2/5/2024	5:00 PM	65	70 J26-J27	Friday	3/5/2024	1:00 AM	66	56 J26-J27	Friday	3/5/2024	3:00 PM	65	66 J26-J27
Thursday	2/5/2024	5:00 PM	51	66 J27-J28	Friday	3/5/2024	1:00 AM	69	57 J27-J28	Friday	3/5/2024	3:00 PM	44	64 J27-J28
Thursday	2/5/2024	5:00 PM	28	59 J28-J29	Friday	3/5/2024	1:00 AM	59	63 J28-J29	Friday	3/5/2024	3:00 PM	16	59 J28-J29
Thursday	2/5/2024	5:00 PM	48	48 J29-J29A	Friday	3/5/2024	1:00 AM	49	52 J29-J29A	Friday	3/5/2024	3:00 PM	31	48 J29-J29A
Thursday	2/5/2024	5:00 PM	46	49 J29A-J30	Friday	3/5/2024	1:00 AM	46	46 J29A-J30	Friday	3/5/2024	3:00 PM	34	46 J29A-J30
Thursday	2/5/2024	5:00 PM	49	49 J30-J31	Friday	3/5/2024	1:00 AM	53	49 J30-J31	Friday	3/5/2024	3:00 PM	49	47 J30-J31
Thursday	2/5/2024	5:00 PM	61	50 J31-J32	Friday	3/5/2024	1:00 AM	65	54 J31-J32	Friday	3/5/2024	3:00 PM	59	50 J31-J32
Thursday	2/5/2024	5:00 PM	48	44 J32-J33	Friday	3/5/2024	1:00 AM	49	55 J32-J33	Friday	3/5/2024	3:00 PM	46	46 J32-J33
Thursday	2/5/2024	5:00 PM	47	15 J33-J34	Friday	3/5/2024	1:00 AM	48	52 J33-J34	Friday	3/5/2024	3:00 PM	47	14 J33-J34
Thursday	2/5/2024	5:00 PM	48	38 J34-J35	Friday	3/5/2024	1:00 AM	49	48 J34-J35	Friday	3/5/2024	3:00 PM	46	30 J34-J35
Thursday	2/5/2024	5:00 PM	3	50 J35-J35A	Friday	3/5/2024	1:00 AM	6	58 J35-J35A	Friday	3/5/2024	3:00 PM	59	49 J35-J35A
Thursday	2/5/2024	5:00 PM	38	63 J35A-J36	Friday	3/5/2024	1:00 AM	67	60 J35A-J36	Friday	3/5/2024	3:00 PM	66	66 J35A-J36
Thursday	2/5/2024	5:00 PM	65	63 J36-J37	Friday	3/5/2024	1:00 AM	69	70 J36-J37	Friday	3/5/2024	3:00 PM	66	67 J36-J37
Thursday	2/5/2024	5:00 PM	68	67 J37-J38	Friday	3/5/2024	1:00 AM	70	70 J37-J38	Friday	3/5/2024	3:00 PM	68	70 J37-J38
Thursday	2/5/2024	5:00 PM	67	67 J38-J39	Friday	3/5/2024	1:00 AM	70	70 J38-J39	Friday	3/5/2024	3:00 PM	68	65 J38-J39
Thursday	2/5/2024	5:00 PM	63	66 J39-J40	Friday	3/5/2024	1:00 AM	67	57 J39-J40	Friday	3/5/2024	3:00 PM	64	63 J39-J40
Thursday	2/5/2024	5:00 PM	63	67 J40-J41	Friday	3/5/2024	1:00 AM	63	59 J40-J41	Friday	3/5/2024	3:00 PM	64	66 J40-J41
Thursday	2/5/2024	5:00 PM	66	64 J41-J42	Friday	3/5/2024	1:00 AM	62	60 J41-J42	Friday	3/5/2024	3:00 PM	63	7 J41-J42
Thursday	2/5/2024	5:00 PM	55	66 J42-J43/44	Friday	3/5/2024	1:00 AM	65	70 J42-J43/44	Friday	3/5/2024	3:00 PM	55	66 J42-J43/44
Thursday	2/5/2024	5:00 PM	11	66 J43/44-J44	Friday	3/5/2024	1:00 AM	66	60 J43/44-J45	Friday	3/5/2024	3:00 PM	14	63 J43/44-J45
Thursday	2/5/2024	5:00 PM	27	58 J45-J46	Friday	3/5/2024	1:00 AM	51	51 J45-J46	Friday	3/5/2024	3:00 PM	27	58 J45-J46
Thursday	2/5/2024	5:00 PM	47	45 J46-J47	Friday	3/5/2024	1:00 AM	50	50 J46-J47	Friday	3/5/2024	3:00 PM	55	40 J46-J47
Thursday	2/5/2024	5:00 PM	57	46 J47-J48	Friday	3/5/2024	1:00 AM	56	57 J47-J48	Friday	3/5/2024	3:00 PM	59	18 J47-J48
Thursday	2/5/2024	9:00 PM	62	60 J1-J2	Friday	3/5/2024	9:00 AM	68	57 J1-J2	Friday	3/5/2024	7:00 PM	70	66 J1-J2
Thursday	2/5/2024	9:00 PM	70	59 J2-J4	Friday	3/5/2024	9:00 AM	70	61 J2-J4	Friday	3/5/2024	7:00 PM	67	70 J2-J4
Thursday	2/5/2024	9:00 PM	64	62 J4-J5	Friday	3/5/2024	9:00 AM	69	58 J4-J5	Friday	3/5/2024	7:00 PM	69	69 J4-J5
Thursday	2/5/2024	9:00 PM	70	64 J5-J6	Friday	3/5/2024	9:00 AM	67	62 J5-J6	Friday	3/5/2024	7:00 PM	63	66 J5-J6
Thursday	2/5/2024	9:00 PM	58	58 J6-J6A	Friday	3/5/2024	9:00 AM	64	69 J6-J6A	Friday	3/5/2024	7:00 PM	17	70 J6-J6A
Thursday	2/5/2024	9:00 PM	57	57 J7-J8	Friday	3/5/2024	9:00 AM	60	60 J7-J8	Friday	3/5/2024	7:00 PM	30	62 J6A-J7
Thursday	2/5/2024	9:00 PM	61	61 J8-J9	Friday	3/5/2024	9:00 AM	60	60 J8-J9	Friday	3/5/2024	7:00 PM	29	62 J8-J9
Thursday	2/5/2024	9:00 PM	57	62 J9-J10	Friday	3/5/2024	9:00 AM	55	57 J9-J10	Friday	3/5/2024	7:00 PM	46	63 J9-J10
Thursday	2/5/2024	9:00 PM	49	50 J10-J11	Friday	3/5/2024	9:00 AM	49	49 J10-J11	Friday	3/5/2024	7:00 PM	38	51 J10-J11
Thursday	2/5/2024	9:00 PM	48	48 J11-J11A	Friday	3/5/2024	9:00 AM	53	27 J11-J11A	Friday	3/5/2024	7:00 PM	47	40 J11-J11A
Thursday	2/5/2024	9:00 PM	49	49 J11A-J12	Friday	3/5/2024	9:00 AM	52	44 J11A-J12	Friday	3/5/2024	7:00 PM	47	44 J11A-J12
Thursday	2/5/2024	9:00 PM	49	49 J12-J13	Friday	3/5/2024	9:00 AM	52	49 J12-J13	Friday	3/5/2024	7:00 PM	47	49 J12-J13
Thursday	2/5/2024	9:00 PM	60	53 J13-J14	Friday	3/5/2024	9:00 AM	59	58 J13-J14	Friday	3/5/2024	7:00 PM	65	59 J13-J14
Thursday	2/5/2024	9:00 PM	67	62 J14-J15	Friday	3/5/2024	9:00 AM	63	66 J14-J15	Friday	3/5/2024	7:00 PM	67	66 J14-J15
Thursday	2/5/2024	9:00 PM	66	62 J15-J15A	Friday	3/5/2024	9:00 AM	69	62 J15-J15A	Friday	3/5/2024	7:00 PM	68	66 J15-J15A
Thursday	2/5/2024	9:00 PM	62	58 J15A-J16	Friday	3/5/2024	9:00 AM	66	62 J15A-J16	Friday	3/5/2024	7:00 PM	65	64 J15A-J16
Thursday	2/5/2024	9:00 PM	64	58 J16-J17	Friday	3/5/2024	9:00 AM	65	65 J16-J17	Friday	3/5/2024	7:00 PM	64	63 J16-J17
Thursday	2/5/2024	9:00 PM	70	50 J17-J18	Friday	3/5/2024	9:00 AM	64	65 J17-J18	Friday	3/5/2024	7:00 PM	65	66 J17-J18
Thursday	2/5/2024	9:00 PM	69	63 J18-J19	Friday	3/5/2024	9:00 AM	63	67 J18-J19	Friday	3/5/2024	7:00 PM	64	66 J18-J19
Thursday	2/5/2024	9:00 PM	70	68 J19-J20	Friday	3/5/2024	9:00 AM	60	62 J19-J20	Friday	3/5/2024	7:00 PM	63	69 J19-J20
Thursday	2/5													

2									
Saturday	4/5/2024	1:00 AM	66	62 J1-J2	Saturday	4/5/2024	3:00 PM	70	63 J1-J2
Saturday	4/5/2024	1:00 AM	68	68 J2-J4	Saturday	4/5/2024	3:00 PM	70	69 J2-J4
Saturday	4/5/2024	1:00 AM	67	65 J4-J5	Saturday	4/5/2024	3:00 PM	70	64 J4-J5
Saturday	4/5/2024	1:00 AM	65	70 J5-J6	Saturday	4/5/2024	3:00 PM	69	69 J5-J6
Saturday	4/5/2024	1:00 AM	63	70 J6-J6A	Saturday	4/5/2024	3:00 PM	67	70 J6-J6A
Saturday	4/5/2024	6 AM	62	63 J6A-J7	Saturday	4/5/2024	3:00 PM	64	65 J6A-J7
Saturday	4/5/2024	1:00 AM	57	60 J7-J8	Saturday	4/5/2024	3:00 PM	56	55 J7-J8
Saturday	4/5/2024	1:00 AM	66	66 J8-J9	Saturday	4/5/2024	3:00 PM	65	62 J8-J9
Saturday	4/5/2024	1:00 AM	62	63 J9-J10	Saturday	4/5/2024	3:00 PM	60	61 J9-J10
Saturday	4/5/2024	1:00 AM	49	48 J10-J11	Saturday	4/5/2024	3:00 PM	52	44 J10-J11
Saturday	4/5/2024	1:00 AM	49	47 J11-J11A	Saturday	4/5/2024	3:00 PM	52	43 J11-J11A
Saturday	4/5/2024	1:00 AM	50	49 J11A-J12	Saturday	4/5/2024	3:00 PM	52	47 J11A-J12
Saturday	4/5/2024	1:00 AM	49	49 J12-J13	Saturday	4/5/2024	3:00 PM	48	47 J12-J13
Saturday	4/5/2024	1:00 AM	66	62 J13-J14	Saturday	4/5/2024	3:00 PM	67	61 J13-J14
Saturday	4/5/2024	1:00 AM	61	68 J14-J15	Saturday	4/5/2024	3:00 PM	66	70 J14-J15
Saturday	4/5/2024	1:00 AM	63	70 J15-J15A	Saturday	4/5/2024	3:00 PM	65	68 J15-J15A
Saturday	4/5/2024	1:00 AM	64	70 J15A-J16	Saturday	4/5/2024	3:00 PM	65	67 J15A-J16
Saturday	4/5/2024	1:00 AM	70	68 J16-J17	Saturday	4/5/2024	3:00 PM	70	65 J16-J17
Saturday	4/5/2024	1:00 AM	70	66 J17-J18	Saturday	4/5/2024	3:00 PM	66	58 J17-J18
Saturday	4/5/2024	1:00 AM	65	62 J18-J19	Saturday	4/5/2024	3:00 PM	65	62 J18-J19
Saturday	4/5/2024	1:00 AM	70	68 J19-J20	Saturday	4/5/2024	3:00 PM	66	64 J19-J20
Saturday	4/5/2024	1:00 AM	67	70 J20-J21	Saturday	4/5/2024	3:00 PM	70	70 J20-J21
Saturday	4/5/2024	1:00 AM	66	70 J21-J21A	Saturday	4/5/2024	3:00 PM	63	60 J21-J21A
Saturday	4/5/2024	1:00 AM	59	70 J21A-J22	Saturday	4/5/2024	3:00 PM	70	59 J21A-J22
Saturday	4/5/2024	2 AM	69	53 J22-J23	Saturday	4/5/2024	3:00 PM	70	65 J22-J23
Saturday	4/5/2024	1:00 AM	70	57 J23-J23A	Saturday	4/5/2024	3:00 PM	0	70 J23-J23A
Saturday	4/5/2024	1:00 AM	60	56 J23A-J24	Saturday	4/5/2024	3:00 PM	62	60 J23A-J24
Saturday	4/5/2024	1:00 AM	50	50 J24-J24A	Saturday	4/5/2024	3:00 PM	48	49 J24-J24A
Saturday	4/5/2024	1:00 AM	49	50 J24A-J25	Saturday	4/5/2024	3:00 PM	48	48 J24A-J25
Saturday	4/5/2024	1:00 AM	70	60 J25-J26	Saturday	4/5/2024	3:00 PM	65	60 J25-J26
Saturday	4/5/2024	1:00 AM	70	70 J26-J27	Saturday	4/5/2024	3:00 PM	66	70 J26-J27
Saturday	4/5/2024	1:00 AM	69	70 J27-J28	Saturday	4/5/2024	3:00 PM	26	70 J27-J28
Saturday	4/5/2024	1:00 AM	63	65 J28-J29	Saturday	4/5/2024	3:00 PM	62	64 J28-J29
Saturday	4/5/2024	1:00 AM	48	49 J29-J29A	Saturday	4/5/2024	3:00 PM	49	49 J29-J29A
Saturday	4/5/2024	1:00 AM	48	49 J29A-J30	Saturday	4/5/2024	3:00 PM	48	48 J29A-J30
Saturday	4/5/2024	1:00 AM	50	50 J30-J31	Saturday	4/5/2024	3:00 PM	49	48 J30-J31
Saturday	4/5/2024	1:00 AM	68	52 J31-J32	Saturday	4/5/2024	3:00 PM	61	51 J31-J32
Saturday	4/5/2024	1:00 AM	49	56 J32-J33	Saturday	4/5/2024	3:00 PM	52	52 J32-J33
Saturday	4/5/2024	1:00 AM	50	51 J33-J34	Saturday	4/5/2024	3:00 PM	50	47 J33-B4
Saturday	4/5/2024	1:00 AM	50	50 J34-J35	Saturday	4/5/2024	3:00 PM	47	49 J34-B5
Saturday	4/5/2024	1:00 AM	64	52 J35-J35A	Saturday	4/5/2024	3:00 PM	61	51 J35-B5A
Saturday	4/5/2024	1:00 AM	69	70 J35A-J36	Saturday	4/5/2024	3:00 PM	70	69 J35A-J36
Saturday	4/5/2024	1:00 AM	70	70 J36-J37	Saturday	4/5/2024	3:00 PM	69	68 J36-B37
Saturday	4/5/2024	1:00 AM	70	70 J37-J38	Saturday	4/5/2024	3:00 PM	70	70 J37-B38
Saturday	4/5/2024	1:00 AM	70	70 J38-J39	Saturday	4/5/2024	3:00 PM	70	70 J38-B39
Saturday	4/5/2024	1:00 AM	69	69 J39-J40	Saturday	4/5/2024	3:00 PM	69	70 J39-J40
Saturday	4/5/2024	1:00 AM	69	63 J40-J41	Saturday	4/5/2024	3:00 PM	69	70 J40-J41
Saturday	4/5/2024	2 AM	69	63 J41-J42	Saturday	4/5/2024	3:00 PM	65	69 J41-J42
Saturday	4/5/2024	1:00 AM	66	63 J42-J43/44	Saturday	4/5/2024	3:00 PM	67	70 J42-J43/44
Saturday	4/5/2024	1:00 AM	66	64 J43/44-J45	Saturday	4/5/2024	3:00 PM	52	67 J43/44-J45
Saturday	4/5/2024	1:00 AM	48	64 J45-J46	Saturday	4/5/2024	3:00 PM	36	60 J45-J46
Saturday	4/5/2024	1:00 AM	49	48 J46-J47	Saturday	4/5/2024	3:00 PM	48	48 J46-J47
Saturday	4/5/2024	1:00 AM	60	51 J47-J48	Saturday	4/5/2024	3:00 PM	57	49 J47-J48
Saturday	4/5/2024	8:00 AM	61	63 J1-J2	Saturday	4/5/2024	8:00 PM	70	61 J1-J2
Saturday	4/5/2024	8:00 AM	63	70 J2-J4	Saturday	4/5/2024	8:00 PM	70	68 J2-J4
Saturday	4/5/2024	8:00 AM	65	70 J4-J5	Saturday	4/5/2024	8:00 PM	70	69 J4-J5
Saturday	4/5/2024	8:00 AM	66	70 J5-J6	Saturday	4/5/2024	8:00 PM	70	70 J5-J6
Saturday	4/5/2024	8:00 AM	58	70 J6-J6A	Saturday	4/5/2024	8:00 PM	67	70 J6-J6A
Saturday	4/5/2024	8:00 AM	55	56 J6A-J7	Saturday	4/5/2024	8:00 PM	65	70 J6A-J7
Saturday	4/5/2024	8:00 AM	63	66 J7-J8	Saturday	4/5/2024	8:00 PM	60	61 J7-J8
Saturday	4/5/2024	8:00 AM	56	67 J8-J9	Saturday	4/5/2024	8:00 PM	63	64 J8-J9
Saturday	4/5/2024	8:00 AM	48	52 J9-J10	Saturday	4/5/2024	8:00 PM	59	52 J9-J10
Saturday	4/5/2024	8:00 AM	46	52 J10-J11	Saturday	4/5/2024	8:00 PM	48	50 J10-J11
Saturday	4/5/2024	8:00 AM	48	52 J11-J11A	Saturday	4/5/2024	8:00 PM	48	48 J11-J11A
Saturday	4/5/2024	8:00 AM	49	50 J11A-J12	Saturday	4/5/2024	8:00 PM	49	47 J11A-J12
Saturday	4/5/2024	8:00 AM	49	50 J12-J13	Saturday	4/5/2024	8:00 PM	48	48 J12-J13
Saturday	4/5/2024	8:00 AM	67	60 J13-J14	Saturday	4/5/2024	8:00 PM	66	59 J13-J14
Saturday	4/5/2024	8:00 AM	68	70 J14-J15	Saturday	4/5/2024	8:00 PM	70	70 J14-J15
Saturday	4/5/2024	8:00 AM	66	65 J15-J16	Saturday	4/5/2024	8:00 PM	67	67 J15-J16
Saturday	4/5/2024	8:00 AM	64	68 J16-J17	Saturday	4/5/2024	8:00 PM	70	65 J16-J17
Saturday	4/5/2024	8:00 AM	68	65 J17-J18	Saturday	4/5/2024	8:00 PM	70	62 J17-J18
Saturday	4/5/2024	8:00 AM	68	70 J18-J19	Saturday	4/5/2024	8:00 PM	70	45 J18-J19
Saturday	4/5/2024	8:00 AM	70	69 J19-J20	Saturday	4/5/2024	8:00 PM	70	70 J19-J20
Saturday	4/5/2024	8:00 AM	70	70 J20-J21	Saturday	4/5/2024	8:00 PM	69	70 J20-J21
Saturday	4/5/2024	8:00 AM	62	66 J21-J21A	Saturday	4/5/2024	8:00 PM	62	61 J21-J21A
Saturday	4/5/2024	8:00 AM	67	70 J21A-J22	Saturday	4/5/2024	8:00 PM	59	67 J21A-J22
Saturday	4/5/2024	8:00 AM	70	70 J22-J23	Saturday	4/5/2024	8:00 PM	70	70 J22-J23
Saturday	4/5/2024	8:00 AM	7	70 J23-J23A	Saturday	4/5/2024	8:00 PM	70	70 J23-J23A
Saturday	4/5/2024	8:00 AM	60	64 J23A-J24	Saturday	4/5/2024	8:00 PM	63	64 J23A-J24
Saturday	4/5/2024	8:00 AM	48	51 J24-J24A	Saturday	4/5/2024	8:00 PM	50	51 J24-J24A
Saturday	4/5/2024	8:00 AM	49	50 J24A-J25	Saturday	4/5/2024	8:00 PM	51	48 J24A-J25
Saturday	4/5/2024	8:00 AM	66	59 J25-J26	Saturday	4/5/2024	8:00 PM	69	61 J25-J26
Saturday	4/5/2024	8:00 AM	70	70 J26-J27	Saturday	4/5/2024	8:00 PM	66	70 J26-J27
Saturday	4/5/2024	8:00 AM	70	69 J27-J28	Saturday	4/5/2024	8:00 PM	70	67 J27-J28
Saturday	4/5/2024	8:00 AM	64	63 J28-J29	Saturday	4/5/2024	8:00 PM	63	62 J28-J29
Saturday	4/5/2024	8:00 AM	50	49 J29-J29A	Saturday	4/5/2024	8:00 PM	50	49 J29-J29A
Saturday	4/5/2024	8:00 AM	49	48 J29A-J30	Saturday	4/5/2024	8:00 PM	49	48 J29A-J30
Saturday	4/5/2024	8:00 AM	51	49 J30-J31	Saturday	4/5/2024	8:00 PM	50	50 J30-J31
Saturday	4/5/2024	8:00 AM	68	52 J31-J32	Saturday	4/5/2024	8:00 PM	68	48 J31-J32
Saturday	4/5/2024	8:00 AM	50	55 J32-J33	Saturday	4/5/2024	8:00 PM	52	56 J32-J33
Saturday	4/5/2024	8:00 AM	48	49 J33-J34	Saturday	4/5/2024	8:00 PM	50	49 J33-J34
Saturday	4/5/2024	8:00 AM	48	50 J34-J35	Saturday	4/5/2024	8:00 PM	51	49 J34-B5
Saturday	4/5/2024	8:00 AM	57	52 J35-J35A	Saturday	4/5/2024	8:00 PM	66	54 J35-B5A
Saturday	4/5/2024	8:00 AM	66	68 J35A-J36	Saturday	4/5/2024	8:00 PM	69	70 J35A-J36
Saturday	4/5/2024	8:00 AM	69	70 J36-J37	Saturday	4/5/2024	8:00 PM	70	70 J36-B37
Saturday	4/5/2024	8:00 AM	70	70 J37-J38	Saturday	4/5/2024	8:00 PM	70	70 J37-B38
Saturday	4/5/2024	8:00 AM	69	70 J38-J39	Saturday	4/5/2024	8:00 PM	70	70 J38-B39
Saturday	4/5/2024	8:00 AM	64	70 J39-J40	Saturday	4/5/2024	8:00 PM	70	70 J39-J40
Saturday	4/5/2024	8:00 AM	69	66 J40-J41	Saturday	4/5/2024	8:00 PM	68	68 J40-J41
Saturday	4/5/2024	8:00 AM	69	66 J41-J42	Saturday	4/5/2024	8:00 PM	67	65 J41-J42
Saturday	4/5/2024	8:00 AM	70	68 J42-J43/44	Saturday	4/5/2024	8:00 PM	68	70 J42-J43/44
Saturday	4/5/2024	8:00 AM	68	70 J43-J44-J45	Saturday	4/5/2024	8:00 PM	64	67 J43-J44-J45
Saturday	4/5/2024	8:00 AM	52	59 J45-J46	Saturday	4/5/2024	8:00 PM	50	63 J45-J46
Saturday	4/5/2024	8:00 AM	47	49 J46-J47	Saturday	4/5/2024	8:00 PM	48	51 J46-J47
Saturday	4/5/2024	8:00 AM	57	52 J47-J48	Saturday	4/5/2024	8:00 PM	59	51 J47-J48

## ORIGINALITY REPORT



## PRIMARY SOURCES

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