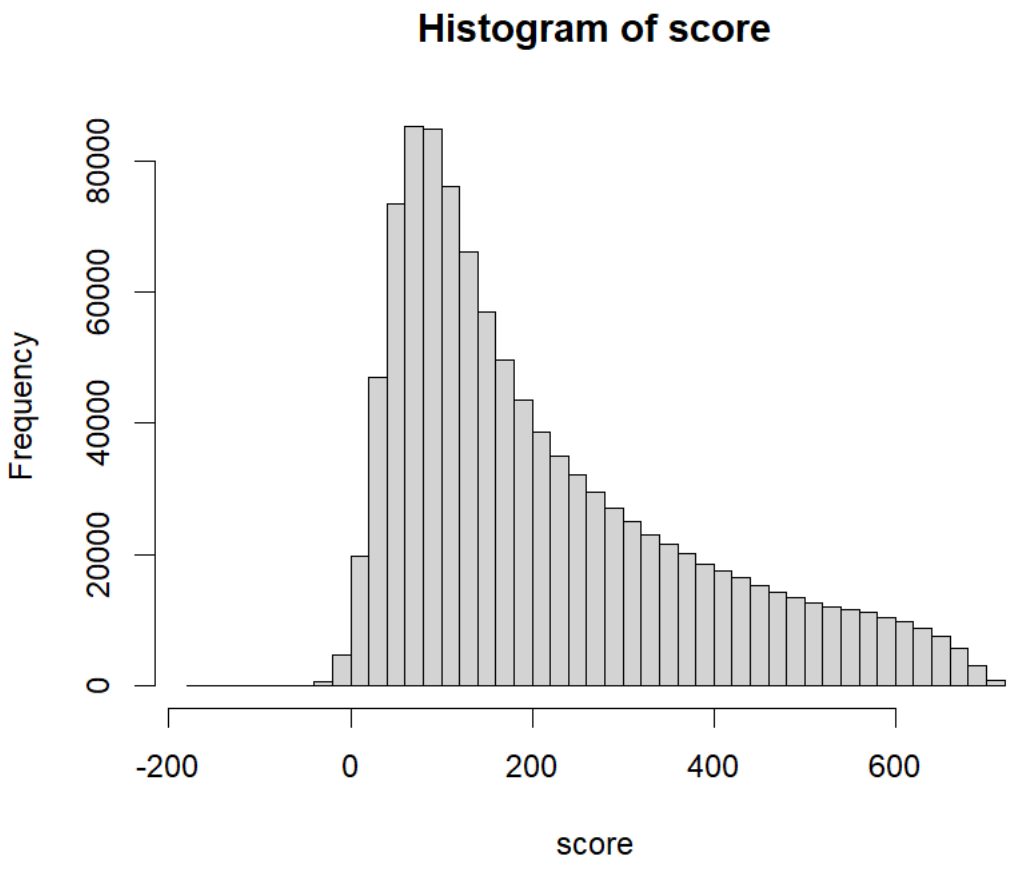
```
data = read.csv("C:\\Users\\amans\\Downloads\\neet_data.csv", header = TRUE, sep = ",")

n = 1048576

score = data[,6]

id = data[,1]

city = data[,3]

hist(score,n=50)

(med = median(score)) # [1] 164

(avg = sum(score)/n) # [1] 217.4961
```



Histogram of scores

```
# Find the median of scores for each unique ID

medians <- aggregate(score, by = list(id), FUN = median)
```

Rename the columns for better readability

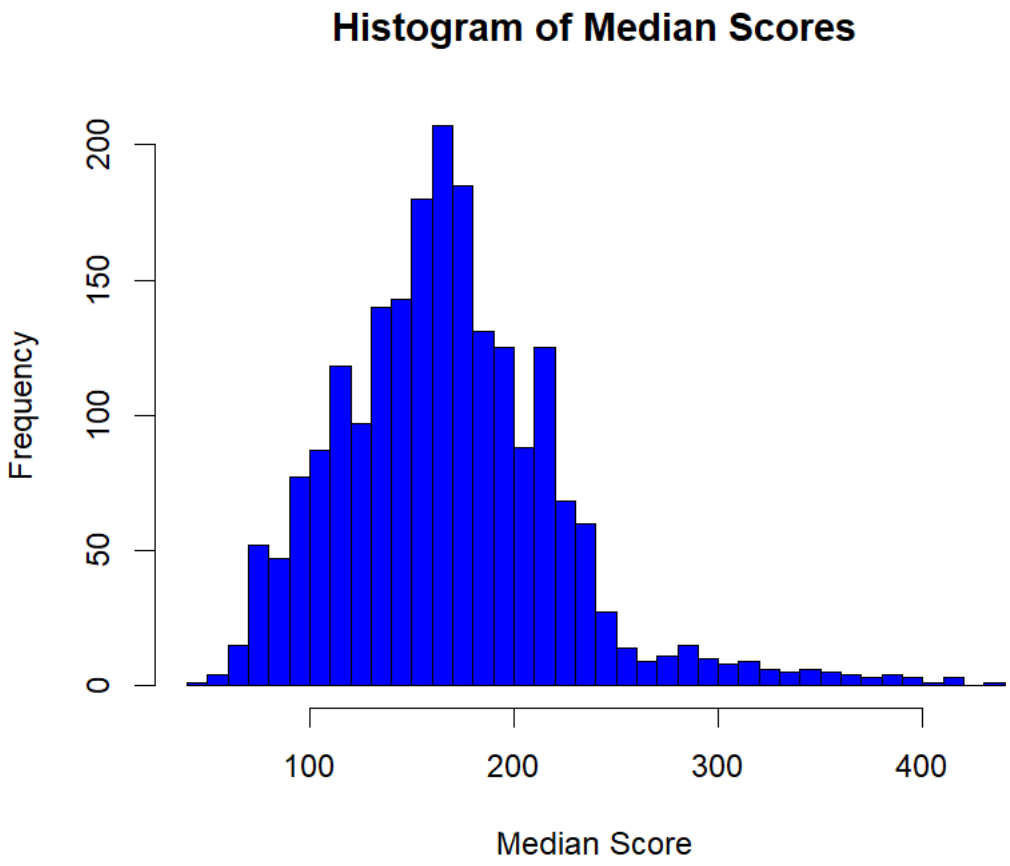
colnames(medians) <- c("ID", "Median_Score")

Print the results

print(medians)

Plot a histogram of the median scores

hist(medians$Median_Score, main="Histogram of Median Scores", xlab="Median Score", ylab="Frequency", col="blue", breaks=30)

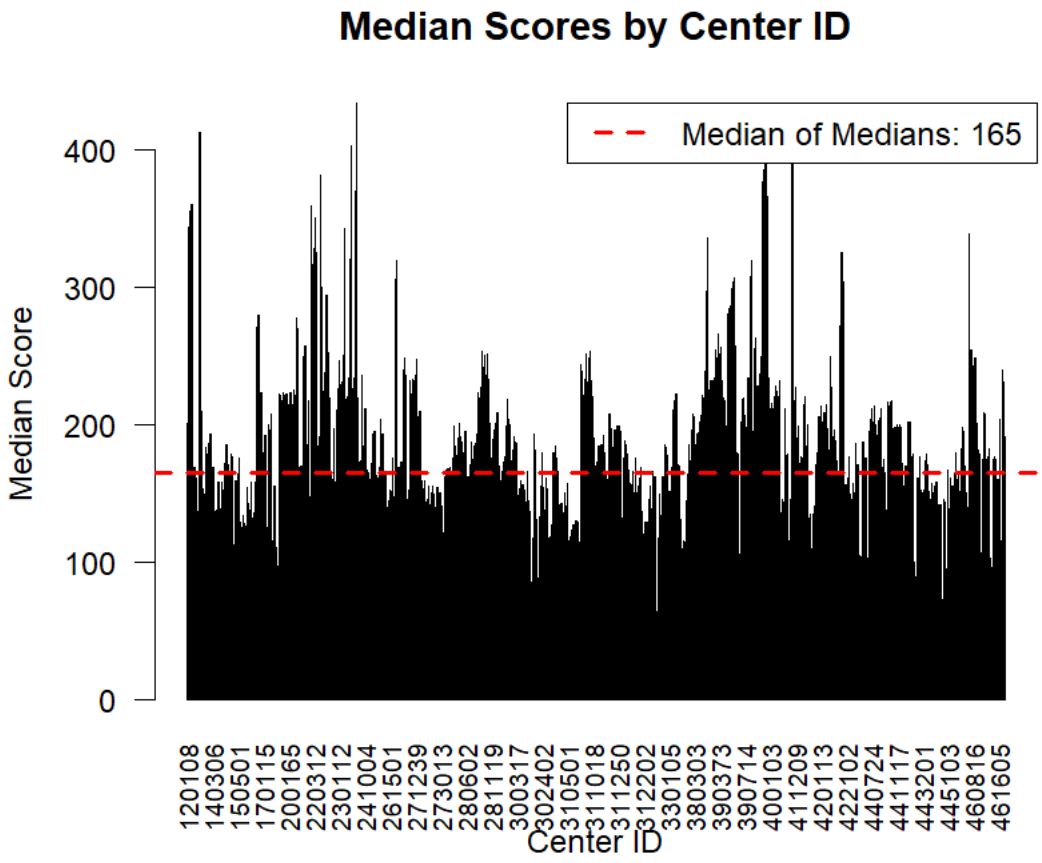


Histogram of median score of centres

Find the median of scores for each center ID

medians_by_center <- aggregate(score ~ center_id, data, median)

```
# Rename the columns for better readability

colnames(medians_by_center) <- c("Center_ID", "Median_Score")


# Calculate the overall median of the center medians

overall_median <- median(medians_by_center$Median_Score)


# Plot a bar plot of the median scores by center ID

barplot(medians_by_center$Median_Score, names.arg = medians_by_center$Center_ID, main =
"Median Scores by Center ID", xlab = "Center ID", ylab = "Median Score", col = "blue", las = 2,
cex.names = 0.8)


# Add a horizontal line representing the overall median of medians

abline(h = overall_median, col = "red", lwd = 2, lty = 2)


# Add a legend

legend("topright", legend = paste("Median of Medians:", round(overall_median, 2)), col = "red", lwd
= 2, lty = 2)
```



Median centre-wise

```
# Calculate the median score for each center
median_scores_by_center <- aggregate(score ~ center_id + city, data, median)
colnames(median_scores_by_center) <- c("Center_ID", "City", "Median_Score_Center")

# Calculate the median score for each city
median_scores_by_city <- aggregate(score ~ city, data, median)
colnames(median_scores_by_city) <- c("City", "Median_Score_City")

# Merge the center and city median scores
merged_data <- merge(median_scores_by_center, median_scores_by_city, by = "City")

# Find the centers whose median score is more than the median score of the city they belong to
centers_above_city_median <- merged_data[merged_data$Median_Score_Center >
1.5*(merged_data$Median_Score_City), ]
```

```
# Print the results
print(centers_above_city_median)
##
                City Center_ID Median_Score_Center Median_Score_City
9              AGRA    440108            186.5            115
331         BHIWANI    230507            403.0            249
395          BUDAUN    442802            161.0            100
400      BULANDSHAHR    442902            177.0            116
788          HISSAR    230614            370.0            235
1069 KHARGONE (WEST NIMAR)    302201            133.0             87
1717         RAMPUR    445402            155.0            102


# Calculate the frequency of each score
score_frequencies <- table(score)

# Convert the table to a data frame
score_frequencies_df <- as.data.frame(score_frequencies)
colnames(score_frequencies_df) <- c("Score", "Frequency")

# Ensure the columns are numeric
score_frequencies_df$Score <- as.numeric(as.character(score_frequencies_df$Score))
score_frequencies_df$Frequency <- as.numeric(as.character(score_frequencies_df$Frequency))

# Calculate the correlation between scores and their frequencies
correlation <- cor(score_frequencies_df$Score, score_frequencies_df$Frequency)

# Print the correlation
print(paste("Correlation between scores and their frequencies:", correlation))
## [1] "Correlation between scores and their frequencies: -0.475063476702362"
```

```
# Create a data frame with score and city columns
data_df <- data.frame(City = city, Score = score)

# Function to calculate correlation for each city
calculate_correlation <- function(df) {
  # Calculate the frequency of each score
  score_frequencies <- table(df$Score)

  # Convert the table to a data frame
  score_frequencies_df <- as.data.frame(score_frequencies)
  colnames(score_frequencies_df) <- c("Score", "Frequency")

  # Ensure the columns are numeric
  score_frequencies_df$Score <- as.numeric(as.character(score_frequencies_df$Score))
  score_frequencies_df$Frequency <- as.numeric(as.character(score_frequencies_df$Frequency))

  # Calculate the correlation between scores and their frequencies
  correlation <- cor(score_frequencies_df$Score, score_frequencies_df$Frequency)

  return(correlation)
}

# Apply the function to each city and store results
library(dplyr)

correlations_by_city <- data_df %>%
  group_by(City) %>%
  summarize(Correlation = calculate_correlation(cur_data())) %>%
  arrange(Correlation)  # Arrange in increasing order of correlation
```

```
# Print the results
print(correlations_by_city, n=370)

##
```

	City	Correlation
	<chr>	*<dbl>*
1	GUWAHATI	-0.683
2	BHILAI NAGAR/DURG	-0.677
3	BILASPUR (CG)	-0.676
4	AGARTALA	-0.674
5	INDORE	-0.674
6	AURANGABAD (MR)	-0.673
7	BANKURA	-0.671
8	JAMMU	-0.671
9	UDAIPUR	-0.669
10	DARBHANGA	-0.668
11	VARANASI	-0.668
12	AKOLA	-0.668
13	NANDED	-0.666
14	MALDA	-0.665
15	SILIGURI	-0.665
16	RAIPUR	-0.664
17	GAYA	-0.663
18	PATNA	-0.663
19	BEED	-0.662
20	JALGAON	-0.660
21	MURSHIDABAD	-0.660
22	MOTIHARI	-0.658
23	MUMBAI	-0.658
24	THANE	-0.656
25	DIBRUGARH	-0.653

26 SRINAGAR (J & K)	-0.652
27 GORAKHPUR	-0.652
28 LUCKNOW	-0.651
29 HYDERABAD/SECUNDERABAD	-0.650
30 AMBIKAPUR	-0.645
31 IMPHAL	-0.642
32 VIJAYAPURA	-0.641
33 DHANBAD	-0.640
34 AYODHYA	-0.640
35 CHANDRAPUR	-0.638
36 KALYANI	-0.637
37 ETAWAH	-0.636
38 PUNE	-0.636
39 NOIDA/GREATER NOIDA	-0.635
40 KOLLAM	-0.633
41 MORADABAD	-0.631
42 PANAJI/MADGAON/MARGAO	-0.630
43 HAJIPUR	-0.629
44 AMRAVATI	-0.629
45 SANGLI	-0.628
46 BULDHANA	-0.628
47 NAGPUR	-0.627
48 BHOPAL	-0.627
49 AMBEDKAR NAGAR	-0.626
50 PURBA MEDINIPUR	-0.626
51 AHMEDNAGAR	-0.626
52 BARPETA	-0.622
53 THIRUVANANTHAPURAM	-0.621
54 PULWAMA	-0.620
55 GWALIOR	-0.619
56 MEERUT	-0.619

57 GOPALGANJ -0.617

58 TUMAKURU -0.616

59 LATUR -0.616

60 PRAYAGRAJ -0.615

61 JABALPUR -0.615

62 TEZPUR -0.615

63 GODHRA -0.613

64 KANCHIPURAM -0.612

65 PALI -0.611

66 BIDAR -0.611

67 DHULE -0.610

68 NAVSARI -0.609

69 SAHARANPUR -0.609

70 BAGALKOT -0.609

71 JALPAIGURI -0.608

72 DELHI/NEW DELHI -0.607

73 RANCHI -0.607

74 FIROZABAD -0.607

75 AHMEDABAD -0.605

76 ALIGARH -0.604

77 BALLARI -0.603

78 JODHPUR -0.603

79 SHIVAMOGA (SHIMOGA) -0.603

80 MAHBUBNAGAR -0.601

81 GONDA -0.601

82 ALWAR -0.601

83 DEORIA -0.600

84 MADHUBANI -0.599

85 SHAHJAHANPUR -0.599

86 MADURAI -0.598

87 KATIHAR -0.597

88	GADCHIROLI	-0.597
89	NALANDA	-0.595
90	BHUBANESWAR	-0.595
91	WARANGAL	-0.594
92	GHAZIPUR	-0.593
93	REWA	-0.593
94	MUZAFFARNAGAR	-0.592
95	NIZAMABAD	-0.592
96	PUDUKKOTTAI	-0.591
97	CHITRADURGA	-0.590
98	ALAPPUZHA/CHENGANNUR	-0.590
99	KANPUR	-0.589
100	MATHURA	-0.588
101	PRATAPGARH	-0.588
102	SITAMARHI	-0.588
103	UJJAIN	-0.588
104	AJMER	-0.587
105	BURDWAN (BARDHAMAN)	-0.585
106	BALANGIR	-0.583
107	KANNUR	-0.581
108	ANANTAPUR	-0.581
109	CHIKABALLAPUR	-0.581
110	GANDHINAGAR	-0.580
111	RATLAM	-0.580
112	JALANDHAR	-0.579
113	COIMBATORE	-0.575
114	ANAND	-0.575
115	NASHIK	-0.575
116	KARAULI	-0.574
117	HIMATNAGAR	-0.574
118	NAUGARH	-0.570

119	SILCHAR	-0.569
120	BUDAUN	-0.569
121	CHANDAULI	-0.569
122	AURANGABAD(MR)	-0.569
123	CUDDALORE	-0.567
124	KANYAKUMARI/NAGERCOIL	-0.565
125	MUZAFFARPUR	-0.565
126	ERNAKULAM/MOOVATTUPUZHA	-0.563
127	DHARMAPURI	-0.562
128	ARIYALUR	-0.560
129	BHANDARA	-0.560
130	SHILLONG	-0.559
131	GONDIA	-0.559
132	MYSURU (MYSORE)	-0.558
133	HAPUR (PANCHSHEEL NAGAR)	-0.557
134	KARIMNAGAR	-0.556
135	SAWAI MADHOPUR	-0.556
136	KRISHNAGIRI	-0.556
137	LUDHIANA	-0.555
138	NADIA	-0.554
139	AMRITSAR	-0.554
140	THRISSUR	-0.554
141	CHENNAI	-0.553
142	KHARAGPUR	-0.551
143	BARAGARH	-0.549
144	KHANDWA	-0.548
145	SITAPUR	-0.547
146	PATAN	-0.547
147	RAI BAREILLY	-0.546
148	ANGAMALY	-0.546
149	NANDURBAR	-0.545

150	KOLKATA	-0.545
151	DARRANG (MANGALDOI)	-0.545
152	KOZHIKODE/CALICUT	-0.543
153	BULANDSHAHR	-0.543
154	RAMPUR	-0.543
155	MEHSANA	-0.542
156	MORENA	-0.541
157	KASARAGOD	-0.540
158	GURUGRAM	-0.540
159	MIRZAPUR	-0.539
160	MADHEPURA	-0.539
161	YAMUNA NAGAR	-0.539
162	AZAMGARH	-0.536
163	TIRUPPUR	-0.536
164	AMBALA	-0.535
165	YADGIR	-0.535
166	ERODE	-0.534
167	KHAMMAM	-0.533
168	UDHAM SINGH NAGAR	-0.531
169	RATNAGIRI	-0.530
170	FARIDABAD	-0.530
171	SANGAREDDY	-0.528
172	MALAPPURAM	-0.527
173	GIRIDIH	-0.526
174	KHARGONE (WEST NIMAR)	-0.525
175	DELHI/NEWDELHI	-0.525
176	SALEM	-0.524
177	JAIPUR	-0.523
178	MANDSAUR	-0.523
179	BAREILLY	-0.522
180	SIVAGANGA	-0.520

181	SOLAPUR	-0.520
182	NALGONDA	-0.519
183	SIROHI	-0.516
184	BENGALURU- URBAN	-0.513
185	RAJGARH	-0.512
186	MAU	-0.511
187	THOOTHUKUDI	-0.507
188	HISSAR	-0.506
189	DUMKA	-0.506
190	SOUTH 24 PARGANAS	-0.506
191	AGRA	-0.504
192	UNA	-0.503
193	MODASA	-0.502
194	BHAWANIPATNA / KALAHANDI	-0.502
195	JUNAGADH	-0.501
196	PATIALA/FATEHGARH SAHIB	-0.500
197	ELURU	-0.498
198	NEEMUCH	-0.496
199	PONDA	-0.496
200	BHILAINAGAR/DURG	-0.495
201	GUNA	-0.494
202	SONIPAT	-0.492
203	SIDDIPET	-0.490
204	PURI	-0.489
205	HOOGHLY	-0.488
206	BHATINDA	-0.486
207	SRIGANGANAGAR	-0.475
208	KARUR	-0.474
209	CHURACHANDPUR	-0.471
210	BASTI	-0.470
211	RAMANATHAPURAM	-0.468

212	CHITRAKOOT	-0.467
213	KENDUJHAR (KEONJHAR)	-0.467
214	GHAZIABAD	-0.466
215	SURAT	-0.466
216	UDUPI/MANIPAL	-0.466
217	JHUNJHUNU	-0.465
218	MUNGER	-0.465
219	JAUNPUR	-0.462
220	RANGA REDDY	-0.462
221	VIZIANAGARAM	-0.460
222	DANTEWADA	-0.460
223	BALASORE (BALESWAR)	-0.458
224	JEYPORE (ODISHA)	-0.457
225	BHIMAVARAM	-0.457
226	KARNAL	-0.456
227	NORTH 24 PARGANAS	-0.456
228	BHIWANI	-0.456
229	CUTTACK	-0.456
230	LAKHISARAI	-0.454
231	PANTNAGAR	-0.454
232	NAGAUR	-0.451
233	DHARWAD	-0.451
234	NAVI MUMBAI	-0.448
235	SINDHUDURG	-0.448
236	FATEHPUR	-0.445
237	TIRUNELVELI	-0.440
238	NAGAPATTINAM	-0.439
239	GANGTOK	-0.438
240	RAYAGADA	-0.438
241	SURYAPET	-0.435
242	SATNA	-0.435

243	PHULBANI (KANDHAMAL)	-0.435
244	KHAGARIA	-0.434
245	YAVATMAL	-0.432
246	JEHANABAD	-0.432
247	GARHWA	-0.432
248	KOTTAYAM	-0.432
249	DHAR	-0.430
250	BERHAMPUR/GANJAM	-0.429
251	PALGHAR	-0.428
252	NARASARAOPET	-0.428
253	SATARA	-0.428
254	UDHAMPUR	-0.426
255	SOLAN	-0.426
256	MACHILIPATNAM	-0.425
257	BELAGAVI (BELGAUM)	-0.425
258	JAMNAGAR	-0.424
259	CHAMARAJNAGAR	-0.422
260	DAVANGERE	-0.417
261	PALAKKAD	-0.417
262	JAMUI	-0.414
263	VIKARABAD	-0.414
264	HALDWANI	-0.414
265	BIKANER	-0.413
266	ANANTNAG	-0.413
267	SAMBA	-0.413
268	ASHOKNAGAR	-0.412
269	WARDHA	-0.411
270	RAICHUR	-0.410
271	PURBAMEDINIPUR	-0.409
272	VILUPPURAM	-0.408
273	MANENDRAGARH	-0.408

274	GULBARGA/KALABURGI	-0.407
275	KODERMA	-0.407
276	CHANDIGARH/MOHALI	-0.406
277	CHIKMAGALUR	-0.404
278	HOSHANGABAD	-0.401
279	BIJNOR	-0.400
280	KOTA	-0.398
281	PARBHANI	-0.398
282	WASHIM	-0.397
283	BARWANI	-0.397
284	TURA	-0.395
285	CHITTOOR	-0.392
286	DEHRADUN	-0.392
287	SHRAVASTI	-0.390
288	FAZILKA	-0.386
289	VELLORE	-0.383
290	TIRUCHIRAPPALLI	-0.380
291	CHHINDWARA	-0.378
292	KAVARATTI	-0.375
293	DHUBRI	-0.374
294	PITTHORAGARH	-0.374
295	GODDA	-0.368
296	PATHANAMTHITTA	-0.367
297	KOLAR	-0.365
298	BALOD	-0.363
299	BALAGHAT	-0.360
300	TIRUPATHI	-0.358
301	HASSAN	-0.358
302	KHEDA	-0.358
303	NARMADA	-0.357
304	SUKMA	-0.352

305 BANASKANTHA -0.348

306 RAJAHMUNDRY -0.345

307 SIWAN -0.345

308 JOWAI -0.345

309 SIRMAUR -0.343

310 KOPPAL -0.342

311 MEDAK -0.342

312 CHIRALA -0.340

313 BAKSA -0.339

314 ROHTAK -0.338

315 BENGALURU-URBAN -0.336

316 ITANAGAR/NAHARLAGUN -0.336

317 JHAJJAR -0.323

318 BHARATPUR -0.309

319 MANGALAGIRI -0.309

320 MYSURU(MYSORE) -0.308

321 KANGRA/PALAMPUR -0.307

322 KATHMANDU -0.304

323 DOHA -0.302

324 KENDUJHAR(KEONJHAR) -0.302

325 MEDCHAL -0.300

326 FARIDKOT -0.300

327 HUBLI -0.300

328 NOIDA/GREATERNOIDA -0.295

329 CHAMOLI -0.294

330 WAYANAD -0.293

331 BIJAPUR -0.292

332 HAVERI -0.290

333 UTTARAKHAND PHONE - 01368-228030 FAX: 01368- 228062 EMAIL: P… -0.285

334 DHALAI -0.284

335 DUBAI -0.279

336 PAURI GARHWAL -0.276

337 RAIBAREILLY -0.273

338 GOOTY -0.269

339 DARJEELING -0.268

340 PORBANDAR -0.266

341 KADI -0.266

342 LOHARDAGA -0.266

343 PARALAKHEMUNDI (GAJAPATI) -0.262

344 BARMER -0.262

345 ABU DHABI -0.261

346 UTTARKASHI -0.258

347 KUWAIT CITY -0.255

348 SHIMLA -0.253

349 EAST KHASI HILLS -0.253

350 MALKANGIRI -0.246

351 LATEHAR -0.232

352 VISAKHAPATNAM -0.224

353 MANGALURU (MANGALORE) -0.206

354 GUMLA -0.205

355 HAYATHNAGAR -0.194

356 KHUNTI -0.194

357 CHURU -0.188

358 BHAVNAGAR -0.185

359 WEST SIKKIM -0.177

360 CHANDEL -0.168

361 RAJKOT -0.146

362 NAMAKKAL -0.141

363 GUNTUR -0.138

364 HOWRAH -0.0945

365 VIJAYAWADA -0.0574

366 RI BHOI -0.0390

367 REWARI -0.0122

368 SIKAR -0.00933

369 TANUKU 0.0486

370 COLOMBO NA

```
# Load necessary packages
library(ggplot2)



# Extract necessary columns
score <- data[,6]
center_id <- data[,1]  # Assuming center ID is in the 1st column

# Create a dataframe to store results
results <- data.frame(Center_ID = unique(center_id), Mean = NA, SD = NA)

# Loop through each center to fit a normal distribution
for (center in unique(center_id)) {
  # Filter data for the current center
  center_data <- data[data$center_id == center,]

  # Fit a normal distribution
  fit <- fitdistr(center_data$score, "normal")

  # Store the mean and standard deviation
  results[results$Center_ID == center, "Mean"] <- fit$estimate["mean"]
  results[results$Center_ID == center, "SD"] <- fit$estimate["sd"]

  # Plot the histogram and normal distribution fit
```

```
  hist(center_data$score, probability = TRUE, main = paste("Histogram of Scores for Center", center),
       xlab = "Score", ylab = "Density", col = "lightblue", breaks = 30)
  curve(dnorm(x, mean = fit$estimate["mean"], sd = fit$estimate["sd"]), add = TRUE, col = "red")
}

# Display the results
print(results)
```