In [ ]:
```
import requests
from bs4 import BeautifulSoup
import pandas as pd
import re

#pip install webdriver-manager
#pip install selenium
```

In [ ]:
```
# Parkrun blocked my request after a few tries, so I had to use a different appr
##This command showed a forbidden error when I tried to get html content directl
#print(soup.prettify())
```

Mimicing a browser to bypass parkrun's bot detection, as the html is otherwise not accessible.

In [ ]:
```
# Set headers to mimic a browser
headers = {
    "User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36
}

# Parkrun results URL (latest Exeter results)
url = "https://www.parkrun.org.uk/exeterriverside/results/latestresults/"
response = requests.get(url, headers=headers)

# Check if request was successful
if response.status_code != 200:
    print(f"Failed to fetch page: {response.status_code}")
else:
    soup = BeautifulSoup(response.text, "html.parser")
    print(soup.prettify()[:1000])  # Print the first 1000 characters of the page
    table = soup.find("table", id="results")
    rows = table.find_all("tr")[1:]  # skip header

    data = []

    for row in rows:
        cols = row.find_all("td")
        if not cols or len(cols) < 6:
            continue

        age_group = cols[5].text.strip()
        # Match common female 18–24 age groups
        if age_group in ["JW19-24", "SW18-19", "F18-24", "SW20-24"]:
            name = cols[1].text.strip()
            time = cols[3].text.strip()
            data.append({
                "Name": name,
                "Time": time,
                "Age Group": age_group
            })

    df = pd.DataFrame(data)
    print(df.head())

#df.to_csv("Exeter_parkrun_results_19/04.csv")
```

In [85]:
```python
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from webdriver_manager.chrome import ChromeDriverManager

# Setup Chrome WebDriver automatically using webdriver_manager, ignore popup
driver = webdriver.Chrome(service=Service(ChromeDriverManager().install()))
```

In [ ]:
```python

```

In [ ]:
```python
from webdriver_manager.chrome import ChromeDriverManager
from selenium.webdriver.chrome.options import Options
import time

# Setup Chrome options to run in headless mode (no UI)
chrome_options = Options()
chrome_options.add_argument("--headless")  # Runs Chrome in headless mode
chrome_options.add_argument("--no-sandbox")  # Disables the sandbox
chrome_options.add_argument("--disable-dev-shm-usage")

# Setup Chrome WebDriver using webdriver_manager
driver = webdriver.Chrome(service=Service(ChromeDriverManager().install()), opti

# Open the park run results page for Exeter Riverside
url = "https://www.parkrun.org.uk/exeterriverside/results/latestresults/"
driver.get(url)

# Allow page to Load
time.sleep(5)
```

In [ ]:
```python
# Bypassing the 403 Forbidden error using Selenium and chrome WebDriver
from webdriver_manager.chrome import ChromeDriverManager
from selenium.webdriver.chrome.options import Options
from selenium.webdriver.common.by import By
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.support import expected_conditions as EC
from selenium.common.exceptions import TimeoutException
from bs4 import BeautifulSoup
import time

# Set up Chrome options
options = Options()
options.add_argument("--headless")  # So that it runs without a popup window
options.add_argument("--disable-blink-features=AutomationControlled")
options.add_argument("start-maximized")
options.add_argument("user-agent=Mozilla/5.0 (Windows NT 10.0; Win64; x64) Apple

# Launch browser
driver = webdriver.Chrome(options=options)
driver.get("https://www.parkrun.org.uk/exeterriverside/results/latestresults/")

# Allow time for JS to Load
time.sleep(5)

try:
    # Get page source and check for real content
    soup = BeautifulSoup(driver.page_source, "html.parser")

    if "403 Forbidden" in soup.text:
        print("Still blocked: Server returned 403 Forbidden.")
    else:
        print("Page loaded successfully. Proceeding...")
        print(soup.prettify()[:1000])  # show a preview of the real content
finally:
    driver.quit()
```

```
Page loaded successfully. Proceeding...
<html lang="en-US">
 <head>
  <meta charset="utf-8"/>
  <meta content="width=device-width, initial-scale=1" name="viewport"/>
  <link href="/wp-content/themes/parkrun/favicons/apple-touch-icon.png" rel="appl
e-touch-icon" sizes="180x180"/>
  <link href="/wp-content/themes/parkrun/favicons/favicon-32x32.png" rel="icon" s
izes="32x32" type="image/png"/>
  <link href="/wp-content/themes/parkrun/favicons/favicon-16x16.png" rel="icon" s
izes="16x16" type="image/png"/>
  <link href="/wp-content/themes/parkrun/favicons/site.webmanifest" rel="manifes
t"/>
  <link color="#2b233d" href="/wp-content/themes/parkrun/favicons/safari-pinned-t
ab.svg" rel="mask-icon"/>
  <link href="/wp-content/themes/parkrun/favicons/favicon.ico" rel="shortcut ico
n"/>
  <meta content="#da532c" name="msapplication-TileColor"/>
  <meta content="/wp-content/themes/parkrun/favicons/browserconfig.xml" name="msa
pplication-config"/>
  <meta content="#ffffff" name="theme-color"/>
  <meta content="Exeter Quay &amp; River Valley Pa
```

In [88]:
```
# Had problems finding the table in html, so I printed the soup to find it
tables = soup.find_all("table")

for i, table in enumerate(tables):
    print(f"\n--- Table {i} ---")
    print(table.prettify()[:500])  # Print the first bit of each table
```

```
--- Table 0 ---
<table class="Results-table Results-table--compact js-ResultsTable">
 <thead>
  <tr class="Results-table-thead">
   <th class="Results-table-th Results-table-th--position">
    Position
   </th>
   <th class="Results-table-th Results-table-th--name">
    parkrunner
   </th>
   <th class="Results-table-th Results-table-th--gender">
    Gender
   </th>
   <th class="Results-table-th Results-table-th--ageGroup">
    Age Group
   </th>
   <th class="Results-table-th Results-table-th--club">
    Club
```

In [ ]:
```
# After inspecting the soup, I found the table I needed. This will be different

# Set up Chrome options
options = Options()
options.add_argument("--headless")
```

```python
options.add_argument("--disable-blink-features=AutomationControlled")
options.add_argument("start-maximized")
options.add_argument("user-agent=Mozilla/5.0 (Windows NT 10.0; Win64; x64) Apple

# Launch browser
driver = webdriver.Chrome(options=options)
driver.get("https://www.parkrun.org.uk/exeterriverside/results/latestresults/")
time.sleep(5)

# Get the page source
soup = BeautifulSoup(driver.page_source, "html.parser")
driver.quit()

# Locate the results table
table = soup.find("table", class_="Results-table")
rows = table.find_all("tr")[1:]  # skip header

data = []

for row in rows:
    cols = row.find_all("td")
    if len(cols) >= 6:
        position = cols[0].text.strip()
        name = cols[1].text.strip()
        gender = cols[2].text.strip()
        age_group = cols[3].text.strip()
        club = cols[4].text.strip()
        time_run = cols[5].text.strip()

        data.append({
            "Position": position,
            "Name": name,
            "Gender": gender,
            "Age Group": age_group,
            "Club": club,
            "Time": time_run
        })

# Convert to DataFrame
df = pd.DataFrame(data)
print(df.head(10))  # Show first 10 results to confirm, this was successful afte
```

```
  Position                                               Name  \
0        1                                            Unknown   
1        2  Ben SHERLOCK114 parkruns | \n                    ...   
2        3  Ben WALKER34 parkruns | \n                       ...   
3        4  James KEANE187 parkruns | \n                     ...   
4        5                                            Unknown   
5        6  Ash VORALIA233 parkruns | \n                     ...   
6        7  Oliver MOORE28 parkruns | \n                     ...   
7        8  Fiona GERMAN96 parkruns | \n                     ...   
8        9  Matthew SMITH83 parkruns | \n                    ...   
9       10  Dylan BUFTON9 parkruns | \n                      ...   

                                    Gender               Age Group  \
0                                                                   
1    Male\n                          1/181  VM40-4474.53% age grade   
2    Male\n                          2/181  JM15-1773.85% age grade   
3    Male\n                          3/181  SM18-1970.25% age grade   
4                                                                   
5    Male\n                          4/181  VM40-4472.37% age grade   
6    Male\n                          5/181  SM30-3468.30% age grade   
7  Female\n                          1/129  SW25-2977.35% age grade   
8    Male\n                          6/181  SM25-2967.22% age grade   
9    Male\n                          7/181  JM15-1770.62% age grade   

                     Club                Time  
0                                              
1                               18:27PB 17:53  
2          City of York AC  18:33First Timer!  
3                               18:46PB 17:50  
4                                              
5  South West Road Runners      19:00PB 18:12  
6                               19:02PB 18:36  
7  South West Road Runners       19:08New PB!  
8                           19:13First Timer!  
9                               19:24PB 17:35  
```

In [ ]:
```python
df.head()
```

Now that I know scraping the parkrun website works, I can clean the data using regex.

In [90]:
```python
import re

# Clean the "Age Group" column to remove extra percentages and text
df["Age Group"] = df["Age Group"].apply(lambda x: re.sub(r'-\d+(\.\d+)?%.*', '',

# Ensure the "Time" column only contains the first 5 characters (xx:xx format)
df["Time"] = df["Time"].apply(lambda x: x[:5] if len(x) >= 5 else x)

# Verify the cleaned columns
print(df[["Age Group", "Time"]].head())
```

```
  Age Group   Time
0                 
1      VM40  18:27
2      JM15  18:33
3      SM18  18:46
4                 
```

In [91]:
```python
# Filter for female age groups relevant to 20-year-old - SW20 really means SW20-
target_age_groups = ["SW20"]
```

```
# Filter the DataFrame
filtered_df = df[df["Age Group"].isin(target_age_groups)]

# Reset index and display the result
filtered_df.reset_index(drop=True, inplace=True)
filtered_df.head()

#filtered_df.to_csv("SW20-24_exeter_results.csv", index=False)  # Saved to CSV f
```

Out[91]:

	Position	Name	Gender	Age Group	Club	Time
0	51	Amy ANGOVE4 parkruns | \n ...	Female\n 7/129	SW20		22:15
1	96	Bethan MEYRICK149 parkruns | \n ...	Female\n 18/129	SW20	Les Croupiers RC	24:52
2	136	Violet Mo WITT23 parkruns | \n ...	Female\n 30/129	SW20		26:34
3	157	Ella O'BRIEN1 parkrun | \n ...	Female\n 37/129	SW20		27:30
4	174	Devina GANDHI27 parkruns | \n ...	Female\n 43/129	SW20		28:12

Now that I've managed to scrape the code just for exeter, I can scrape other parkrun events in the Devon area. The following code loops through any linked urls to latest parkrun results - so these will be different now as the base code I scraped was on 18/04/2024.

In [ ]:

```
import time
import re
import pandas as pd
from selenium import webdriver
from selenium.webdriver.chrome.options import Options
from bs4 import BeautifulSoup

# List of selected Parkrun URLs in Devon/Exeter
urls = [
    "https://www.parkrun.org.uk/exeterriverside/results/latestresults/",
    "https://www.parkrun.org.uk/exmouth/results/latestresults/",
    "https://www.parkrun.org.uk/cranbrookcountrypark/results/latestresults/",
    "https://www.parkrun.org.uk/teignmouthpromenade/results/latestresults/",
    "https://www.parkrun.org.uk/greendalefarmshop/results/latestresults/",
    "https://www.parkrun.org.uk/penryncampus/results/latestresults/",
    "https://www.parkrun.org.uk/plymvalley/results/latestresults/",
    "https://www.parkrun.org.uk/mountedgcumbe/results/latestresults/",
    "https://www.parkrun.org.uk/centralplymouth/results/latestresults/"
]

#Function to bypass 403 forbidden error and scrape data from each url
def scrape_parkrun_results(url):
    options = Options()
    options.add_argument("--headless")
    options.add_argument("user-agent=Mozilla/5.0 (Windows NT 10.0; Win64; x64) A
    driver = webdriver.Chrome(options=options)
    driver.get(url)
    time.sleep(5)

    try:
        soup = BeautifulSoup(driver.page_source, "html.parser")
        table = soup.find("table", {"class": "Results-table Results-table--compa

        data = []
        if table:
            rows = table.find_all("tr")[1:]  # Skip header

            for row in rows:
                cols = row.find_all("td")
                if len(cols) >= 6:
                    position = cols[0].text.strip()
                    parkrunner = cols[1].text.strip()
                    gender = cols[2].text.strip()
                    age_group = cols[3].text.strip()
                    club = cols[4].text.strip()
                    time_result = cols[5].text.strip()

                    if "SW20-24" in age_group:
                        # Clean age group
                        age_group = re.sub(r'-\d+(\.\d+)?%.*', '', age_group)
                        # Clean time to just xx:xx - the first 5 characters, thi
                        time_clean = time_result[:5]

                        data.append({
                            "Parkrun": url.split("/")[3].capitalize(),
                            "Position": position,
                            "Name": parkrunner,
                            "Gender": gender,
                            "Age Group": age_group,
                            "Club": club,
                            "Time": time_clean
                        })
#Prints when loop collects data from one location
            print(f" Data collected from {url.split('/')[3].capitalize()}")

        return pd.DataFrame(data)

    finally:
        driver.quit()

# Loop through all URLs and combine data
all_results = pd.DataFrame()

for i, url in enumerate(urls, start=1):
    print(f"\nScraping ({i}/{len(urls)}): {url}")
    df = scrape_parkrun_results(url)
    if not df.empty:
        all_results = pd.concat([all_results, df], ignore_index=True)

# Uncomment to save as CSV
# all_results.to_csv("sw20-24_devon_parkruns.csv", index=False)

print(all_results.head())
```

```
Scraping (1/9): https://www.parkrun.org.uk/exeterriverside/results/latestresults/
✅ Data collected from Exeterriverside

Scraping (2/9): https://www.parkrun.org.uk/exmouth/results/latestresults/
✅ Data collected from Exmouth

Scraping (3/9): https://www.parkrun.org.uk/cranbrookcountrypark/results/latestres
ults/
✅ Data collected from Cranbrookcountrypark

Scraping (4/9): https://www.parkrun.org.uk/teignmouthpromenade/results/latestresu
lts/
✅ Data collected from Teignmouthpromenade

Scraping (5/9): https://www.parkrun.org.uk/greendalefarmshop/results/latestresult
s/
✅ Data collected from Greendalefarmshop

Scraping (6/9): https://www.parkrun.org.uk/penryncampus/results/latestresults/
✅ Data collected from Penryncampus

Scraping (7/9): https://www.parkrun.org.uk/plymvalley/results/latestresults/
✅ Data collected from Plymvalley

Scraping (8/9): https://www.parkrun.org.uk/mountedgcumbe/results/latestresults/
✅ Data collected from Mountedgcumbe

Scraping (9/9): https://www.parkrun.org.uk/centralplymouth/results/latestresults/
✅ Data collected from Centralplymouth

Preview of combined results:
           Parkrun Position  \
0  Exeterriverside       51
1  Exeterriverside       96
2  Exeterriverside      136
3  Exeterriverside      157
4  Exeterriverside      174

                                                Name  \
0  Amy ANGOVE4 parkruns | \n                         ...
1  Bethan MEYRICK149 parkruns | \n                   ...
2  Violet Mo WITT23 parkruns | \n                    ...
3  Ella O'BRIEN1 parkrun | \n                        ...
4  Devina GANDHI27 parkruns | \n                     ...

                                 Gender Age Group              Club  Time
0   Female\n                          7/129      SW20                   22:15
1  Female\n                          18/129      SW20  Les Croupiers RC  24:52
2  Female\n                          30/129      SW20                   26:34
3  Female\n                          37/129      SW20                   27:30
4  Female\n                          43/129      SW20                   28:12
```

In [96]:
```
all_results.head()
```

Out[96]:

	Parkrun	Position	Name	Gender	Age Group	Club	Time
0	Exeterriverside	51	Amy ANGOVE4 parkruns | \n ...	Female\n 7/129	SW20		22:15
1	Exeterriverside	96	Bethan MEYRICK149 parkruns | \n ...	Female\n 18/129	SW20	Les Croupiers RC	24:52
2	Exeterriverside	136	Violet Mo WITT23 parkruns | \n ...	Female\n 30/129	SW20		26:34
3	Exeterriverside	157	Ella O'BRIEN1 parkrun | \n ...	Female\n 37/129	SW20		27:30
4	Exeterriverside	174	Devina GANDHI27 parkruns | \n ...	Female\n 43/129	SW20		28:12

Calculating mean and median of the 5k times.

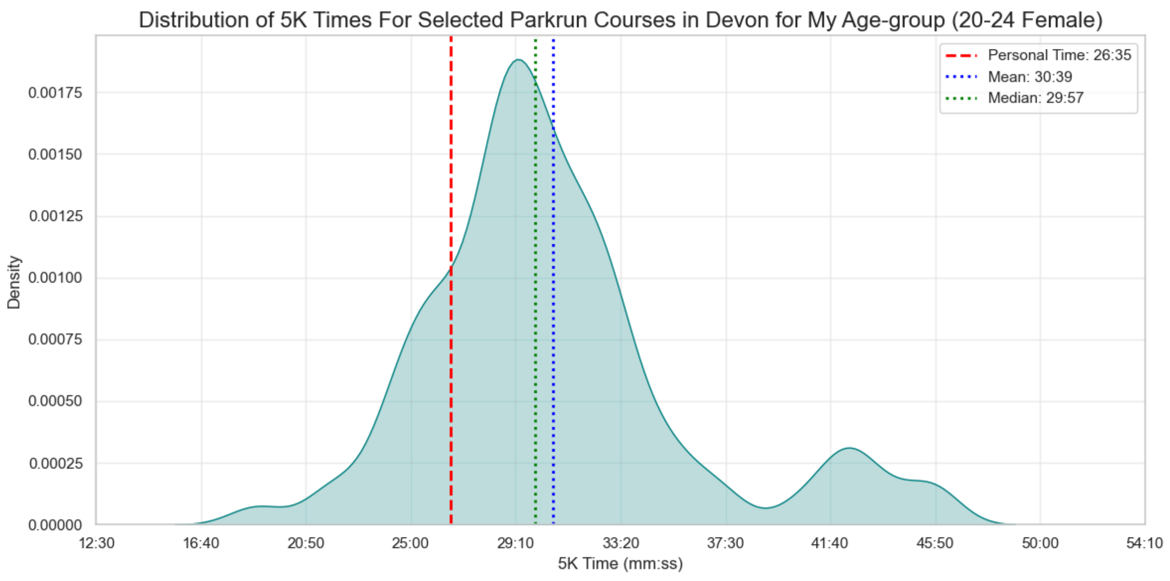
In [99]:

```python
#Finding average 5k time - using base data rather than latest parkrun results as

# csv file with all results
df = pd.read_csv("sw20-24_devon_parkruns.csv")

# convert time to seconds for calculation
def time_to_seconds(t):
    try:
        minutes, seconds = map(int, t.split(":"))
        return minutes * 60 + seconds
    except:
        return None  # handles bad formats

df["Time_seconds"] = df["Time"].apply(time_to_seconds)

# Drop rows where conversion failed
df_cleaned = df.dropna(subset=["Time_seconds"])

# Calculate the average in seconds
average_seconds = df_cleaned["Time_seconds"].mean()

# Convert back to mm:ss format
average_minutes = int(average_seconds // 60)
average_remainder_seconds = int(average_seconds % 60)
average_time_str = f"{average_minutes}:{average_remainder_seconds:02d}"

# Median
median_seconds = df_cleaned["Time_seconds"].median()
med_minutes = int(median_seconds // 60)
med_seconds = int(median_seconds % 60)
median_time_str = f"{med_minutes}:{med_seconds:02d}"

print("Average 5K time:", average_time_str)
print("Median 5K time:", median_time_str)
```

```
Average 5K time: 30:39
Median 5K time: 29:57
```

Making a KDE plot to compare my 5k times to the parkrun times of people in my category.

In [ ]:
```
import seaborn as sns
import matplotlib.pyplot as plt
import datetime

#reusing time to seconds funtion from above
df["Time (s)"] = df["Time"].apply(time_to_seconds)
clean_df = df.dropna(subset=["Time (s)"])

# My 5K time: 26:35
your_time_seconds = 26 * 60 + 35

# Plot KDE
plt.figure(figsize=(12, 6))
sns.kdeplot(data=clean_df, x="Time (s)", fill=True, color="teal", bw_adjust=0.5)

# Add vertical line for my time, mean, and median
plt.axvline(your_time_seconds, color="red", linestyle="--", linewidth=2, label="
plt.axvline(average_seconds, color="blue", linestyle=":", linewidth=2, label=f"M
plt.axvline(median_seconds, color="green", linestyle=":", linewidth=2, label=f"M

# Convert x-axis to mm:ss format
xticks = plt.xticks()[0]
xtick_labels = [str(datetime.timedelta(seconds=int(x)))[2:] for x in xticks]
plt.xticks(xticks, xtick_labels)

# Labels and styling
plt.title("Distribution of 5K Times For Selected Parkrun Courses in Devon for My
plt.xlabel("5K Time (mm:ss)", fontsize=12)
plt.ylabel("Density", fontsize=12)
plt.legend()
plt.grid(True, alpha=0.3)
plt.tight_layout()
#plt.savefig("5k_time_distribution.png", dpi=300)  # Save the figure
plt.show()
```


Distribution of 5K Times For Selected Parkrun Courses in Devon for My Age-group (20-24 Female)
Personal Time: 26:35
Mean: 30:39
Median: 29:57
Density
12:30
16:40
20:50
25:00
29:10
33:20
37:30
41:40
45:50
50:00
54:10
5K Time (mm:ss)