AMERICAN INTERNATIONAL UNIVERSITY BANGLADESH

Faculty of Engineering

Laboratory Report Cover Sheet

Students must complete all details except the faculty use part.

Please submit all reports to your subject supervisor or the office of the concerned faculty.

Laboratory Title: Project Report

Experiment Number: **Due Date: Semester:** Summer

Subject Code: **Subject Name:** Programming In Python

Section: A **Course Instructor:** Akinul Islam Jony

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Group Number (if applicable): ☐ Individual Submission ☑ Group Submission

No.	Student Name	Student Id	Student Signature	Date
Submitted by:				
1	Rayhan Md Abu Masum Rayhan	18-37219-1		14/08/2021
Group Members:				

2				
3				
4				
5				

In [87]:
```
#Import Libraries
import os import
numpy as np import
seaborn as sns import
pandas as pd
import matplotlib.pyplot as plt
```

In [2]:
```
project_directory = r"C:\Users\Rayhan\Desktop\New folder\Python\Project_Files\Project_F
attendence_directory = r"C:\Users\Rayhan\Desktop\New folder\Python\Project_Files\Projec
quiz_directory = r"C:\Users\Rayhan\Desktop\New folder\Python\Project_Files\Project_File
export_directory = r"C:\Users\Rayhan\Desktop\New folder\Python\Project_Files\Project_Fi
```

In [3]:
```
#Change WOrking Directory to project folder
os.chdir(project_directory)
```

In [4]:
```
#list file and folders of project directory project_files
= os.listdir()
```

In [5]:
```
#switch to attendence folder os.chdir(attendence_directory)
```

In [6]:
```
attendence_files  = os.listdir()
```

In [7]:
```
#switch back
os.chdir(project_directory)
```

In [8]:
```
#see the name of project folder's files project_files
```

Out[8]:
```
['.ipynb_checkpoints',
 'Assignment.csv',
```

```
'Attendance_files',
'Grade Sheet of Students.csv',
'Lab Exam.csv',
'Lab Exam.xlsx',
'made_attendence_mark.csv',
'made_student_db.csv',
'project_details.rtf',
'project_rayhan.ipynb',
'project_rayhan_final.ipynb',
'Quizes',
'rayhan_project.ipynb',
'~$oject_details.rtf']
```

In [9]:

```
#read assignment mark file assignment_mark =
pd.read_csv( 'Assignment.csv' )
```

In [10]:

```
#drop unnecessary columns

assignment_mark = assignment_mark.drop(columns="SL")
```

In [11]:

```
#make a student Database student_db =
assignment_mark["Student ID"]
```

In [12]:

```
#join first and last name to get full name, will be used for attendence
student_names = assignment_mark["Name"].tolist() student_full_names = []
for name in student_names:     if len(name.split(","))==2:
        new_name = name.split(", ")[1]+ " " + name.split(",")[0]
else:
        new_name = name

    student_full_names.append(new_name) student_names
= pd.DataFrame(student_full_names)
student_names.columns=["Full Name"]
```

In [13]:

```
#concat full names with our result databse student_db =
pd.concat([student_db,student_names],axis=1)
student_db.columns = ["Student ID","Full Name"]
```

In [14]:

```
#set index to Student ID, will be used as unique identifier
student_db = student_db.set_index('Student ID')
```

In [15]:

```
#set index to Student ID, will be used as unique identifier
assignment_mark  = assignment_mark.set_index('Student ID')
```

In [16]:
```
#drop old name column, we have full names now
assignment_mark = assignment_mark.drop(columns=["Name"])
```

In [17]:
```
#add assignment mark to the db student_db =
pd.concat([student_db,assignment_mark],axis=1)
```

In [18]:
```
#rename assignment marks column student_db =
student_db.rename(columns={"Ass.":"Assignment Marks"})
```

In [19]:
```
#load lab result file lab_exam =
pd.read_csv( 'Lab Exam.csv' )
```

In [20]:
```
#slice our needed data lab_mark =
lab_exam[["Email",'Total points']]
```

In [21]:
```
#get student id from email
stud_id = [] for mail in
lab_mark["Email"]:
    stud_id.append(mail.split("@")[0])
stud = pd.DataFrame(stud_id,columns=["Student ID"])
```

In [22]:
```
#make a lab mark datasheet lab_mark =
pd.concat([stud,lab_mark],axis=1)
```

In [23]:
```
#set index to Student ID, will be used as unique identifier
lab_mark = lab_mark.set_index("Student ID")
```

In [24]:
```
#drop email column lab_mark =
lab_mark.drop(columns="Email")
```

In [25]:
```
#rename column name lab_mark.columns=["Lab
Marks"]
```

In [26]:
```
#add lab marks to our db student_db =
pd.concat([student_db,lab_mark],axis=1)
```

In [27]:

```
#change to quiz marks folder os.chdir(quiz_directory)
```

In [28]:

```
#read data quiz_1 = pd.read_csv("Quiz 1.csv")[['Email','Total
points']]
```

In [29]:

```
#read data quiz_2 = pd.read_csv("Quiz 2.csv")[['Email','Total
points']]
```

In [30]:

```
#read data quiz_3 = pd.read_csv("Quiz 3.csv")[['Email','Total
points']]
```

In [31]:

```
#get student id from email for quiz 1
stud_id = [] for mail in
quiz_1["Email"]:
    stud_id.append(mail.split("@")[0])
stud = pd.DataFrame(stud_id,columns=["Student ID"])
quiz_1 = pd.concat([stud,quiz_1],axis=1).sort_values('Student ID').reset_index(drop=Tru
```

In [32]:

```
#get student id from email for quiz 2
stud_id = [] for mail in
quiz_2["Email"]:
    stud_id.append(mail.split("@")[0])
stud = pd.DataFrame(stud_id,columns=["Student ID"])
quiz_2 = pd.concat([stud,quiz_2],axis=1).sort_values('Student ID').reset_index(drop=Tru
```

In [33]:

```
#get student id from email for quiz 3
stud_id = [] for mail in
quiz_3["Email"]:
    stud_id.append(mail.split("@")[0])
stud = pd.DataFrame(stud_id,columns=["Student ID"])
quiz_3 = pd.concat([stud,quiz_3],axis=1).sort_values('Student ID').reset_index(drop=Tr
```

In [34]:

```
#set index to Student ID, will be used as unique identifier
quiz_1 = quiz_1.set_index("Student ID") quiz_1 =
quiz_1.drop(columns=["Email"]) quiz_1.columns=["Quiz 1"]
```

In [35]:

```
#set index to Student ID, will be used as unique identifier
quiz_2 = quiz_2.set_index("Student ID") quiz_2 =
quiz_2.drop(columns=["Email"]) quiz_2.columns=["Quiz 2"]
```

In [36]:

```
#set index to Student ID, will be used as unique identifier
quiz_3 = quiz_3.set_index("Student ID") quiz_3 =
quiz_3.drop(columns=["Email"]) quiz_3.columns=["Quiz 3"]
```

In [37]:
```
quiz_mark = pd.concat([quiz_1,quiz_2,quiz_3],sort=False,axis=1)
```

In [38]:
```
#replace Nan Values, or undefined values with 0 quiz_mark
= quiz_mark.fillna(0)
```

In [39]:
```
def best_marks(mark1,mark2,mark3):     return
 max([mark1+mark2,mark2+mark3,mark3+mark1])
```

In [40]:
```
best_quiz_score = [] qm =
quiz_mark.values.tolist() for
marks in qm:
    best_quiz_score.append(best_marks(marks[0],marks[1],marks[2]))
bqs = pd.DataFrame(best_quiz_score,columns=["Best Score"]) bqs =
bqs.set_index(quiz_mark.index.values)
```

In [41]:
```
quiz_mark = pd.concat([quiz_mark,bqs],axis=1)
```

In [42]:
```
student_db = pd.concat([student_db,quiz_mark],axis=1)
```

In [43]:
```
#switch to attendence folder os.chdir(attendence_directory)
```

In [44]:
```
files = os.listdir()
```

In [45]:
```
files
```

Out[45]:
```
['Week_1_Lab.csv',
 'Week_1_Theory.csv',
 'Week_2_Theory.csv',
 'Week_4_Lab_(Makeup).csv',
 'Week_5_Lab.csv']
```

In [46]:
```
#create a blank df, to append attendence marks to
attendance_df = pd.DataFrame()
```

In [47]:
```
#create attendence sheet from attendence files for
file in files:
    df = pd.read_csv(file)     df =
df.set_index("Full Name")     df =
df.drop(columns=["Timestamp"])     df =
df[df["User Action"] != "Left"]     df =
df[~df.index.duplicated(keep='first')]
df.columns=[file.split(".")[0]]

    attendance_df = pd.concat([attendance_df,df],axis=1)
```

In [48]:
```
#for joining a class, student gets 2 mark attendance_df
= attendance_df.replace("Joined",2)
```

In [49]:
```
#for not joining, which is now NaN valued, Student gets 0
attendance_df = attendance_df.fillna(0)
```

In [50]:
```
#count total attendence Mark
Attendence_Marks = [] for row in
range(len(attendance_df)):
    temp_total_mark=0     for col in
range(len(attendance_df.columns)):
        temp_total_mark = temp_total_mark + attendance_df.iloc[row,col]
Attendence_Marks.append(temp_total_mark)
```

In [51]:
```
#create total attendece marks
Attendence_Marks = pd.DataFrame(Attendence_Marks,columns=["Total Attendence
Marks"],ind
```

In [52]:
```
#add total marks to attendence sheet attendance_df =
pd.concat([attendance_df,Attendence_Marks],axis=1)
```

In [53]:
```
#reset index of our database
student_db = student_db.reset_index()
```

In [54]:
```
#rename columns
student_db.columns = ['Student ID', 'Full Name', 'Assignment Marks', 'Lab Marks', 'Quiz
'Best Quiz Score']
```

In [55]:
```
#set index to full name student_db =
student_db.set_index("Full Name")
```

In [56]:
```
#add attendence mark student_db =
pd.concat([student_db,attendance_df],axis=1)
```

In [57]:
```
#drop students who didn't participate in exam student_db
= student_db.dropna()
```

In [58]:
```
#rename columns
student_db.columns = ['Student ID', 'Assignment Marks', 'Lab Marks', 'Quiz 1', 'Quiz 2'
       'Best Quiz Score', 'Week_1_Lab', 'Week_1_Theory', 'Week_2_Theory',
       'Week_4_Lab_(Makeup)', 'Week_5_Lab', 'Total Attendence Marks']
```

In [59]:
```
#for grading, add marks whhich are in following columns
summable_columns = [1,2,6,12]
```

In [60]:
```
def grader(score):     if
score>=90:         return "A+"
elif score>=85 and score<90:
        return "A"     elif
score>=80 and score<85:
        return "B+"     elif
score>=75 and score<80:
        return "B"     elif
score>=70 and score<75:
        return "C+"     elif
score>=65 and score<70:
        return "C+"     elif
score>=60 and score<65:
        return "D+"     elif
score>=50 and score<60:
        return "D"
else:
        return "F"
```

In [61]:
```
#count total mark and grades
total_marks = [] grades=[] for i
in range(len(student_db)):
    total_mark = 0     for col in
summable_columns:         total_mark
+=student_db.iloc[i,col]
total_marks.append(total_mark)
grades.append(grader(total_mark))
```

In [62]:
```
total_marks_df=pd.DataFrame(total_marks,columns=["Total Score"],index=student_db.index)
grades_df = pd.DataFrame(grades,columns=["Obtained Grade"],index=student_db.index)
```

In [63]:
```
#add marks and grades student_db =
pd.concat([student_db,total_marks_df,grades_df],axis=1)
```

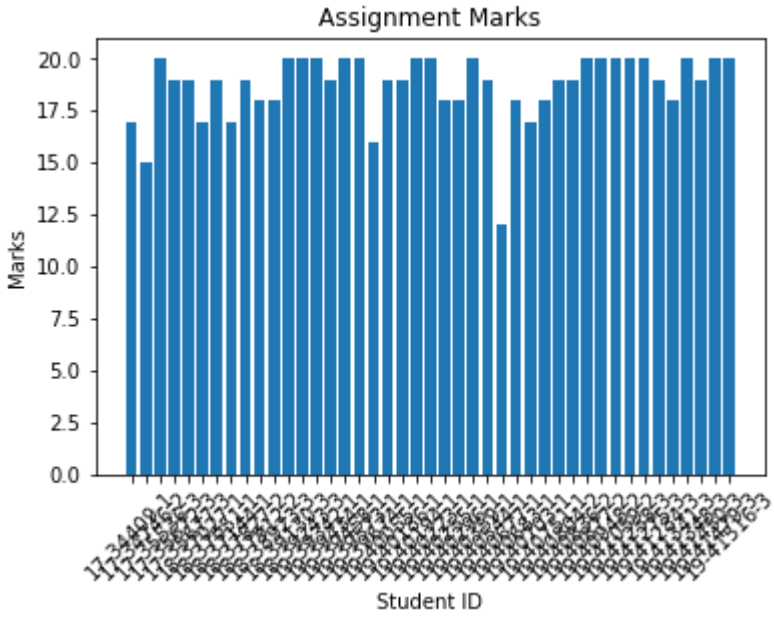
In [64]:
```
#reset index student_db =
student_db.reset_index()
```

In [65]:
```
#rename columns
student_db.columns = ['Full Name', 'Student ID', 'Assignment Marks', 'Lab Marks', 'Quiz
       'Quiz 3', 'Best Quiz Score', 'Week_1_Lab', 'Week_1_Theory',
       'Week_2_Theory', 'Week_4_Lab_(Makeup)', 'Week_5_Lab',
       'Total Attendence Marks', 'Total Score', 'Obtained Grade']
```

In [66]:
```
#rearrange columns
student_db = student_db.reindex(columns=['Student ID','Full Name', 'Assignment Marks',
       'Quiz 3', 'Best Quiz Score', 'Week_1_Lab', 'Week_1_Theory',
'Week_2_Theory', 'Week_4_Lab_(Makeup)', 'Week_5_Lab',
       'Total Attendence Marks', 'Total Score', 'Obtained Grade'])
```

In [67]:
```
#export result sheet os.chdir(export_directory)
student_db.to_csv("Grade Sheet of Students.csv")
```

In [86]:
```
plt.figure()
plt.bar(student_db["Student
ID"],student_db["Assignment Marks"])
plt.xticks(rotation=45) plt.xlabel("Student
ID") plt.ylabel("Marks")
plt.title("Assignment Marks")
plt.savefig("Assignment.png",dpi=1000,faceco
lor="white")
```

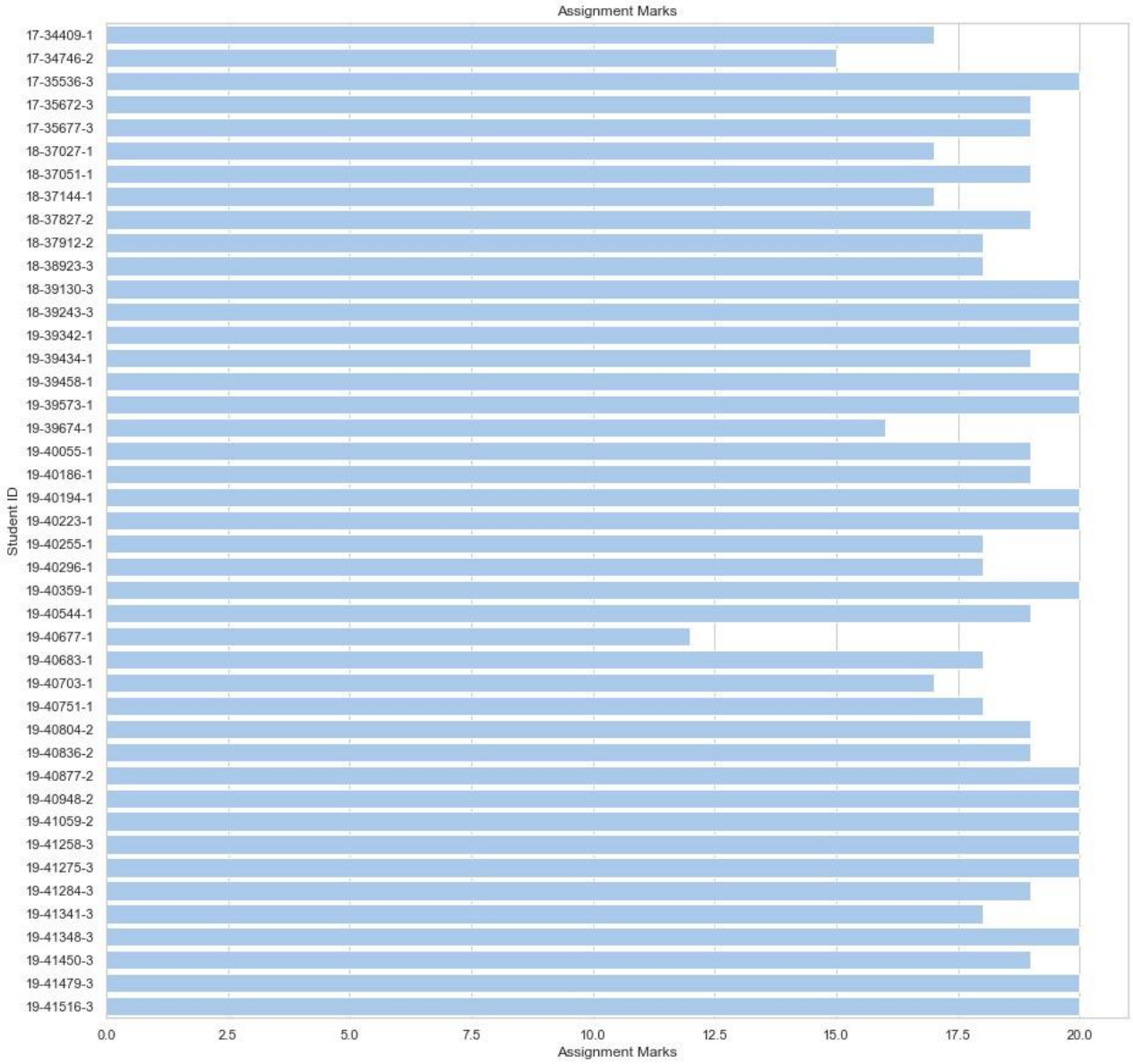


In [104…

```
sns.set_theme(style="whitegrid")

# Initialize the matplotlib figure
f, ax = plt.subplots(figsize=(15,
15))


# Plot the total dataset
sns.set_color_codes("pastel")
barplot = sns.barplot(x=student_db["Assignment Marks"], y=student_db["Student
ID"],             label="Total", color="b") barplot.set(title='Assignment Marks')
fig = barplot.get_figure()
fig.savefig("Assignment.png",dpi=300)
```

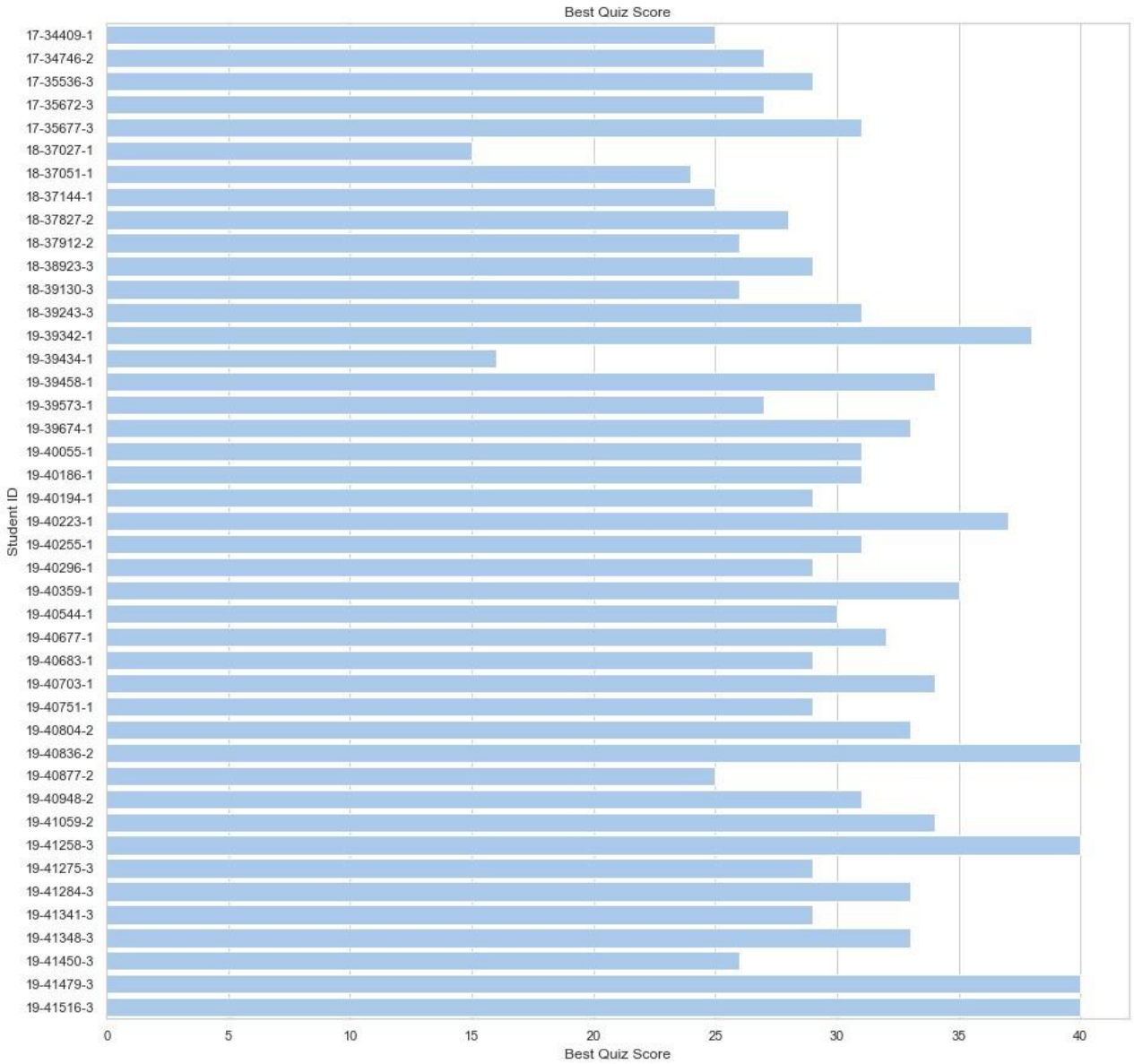


In [108…

```
sns.set_theme(style="whitegrid")

# Initialize the matplotlib figure
f, ax = plt.subplots(figsize=(15,
15))


# Plot the total dataset
sns.set_color_codes("pastel")
barplot = sns.barplot(x=student_db["Best Quiz Score"], y=student_db["Student
ID"],             label="Total", color="b") barplot.set(title='Best Quiz Score')
fig = barplot.get_figure()
fig.savefig("Best Quiz Score",dpi=300)
```

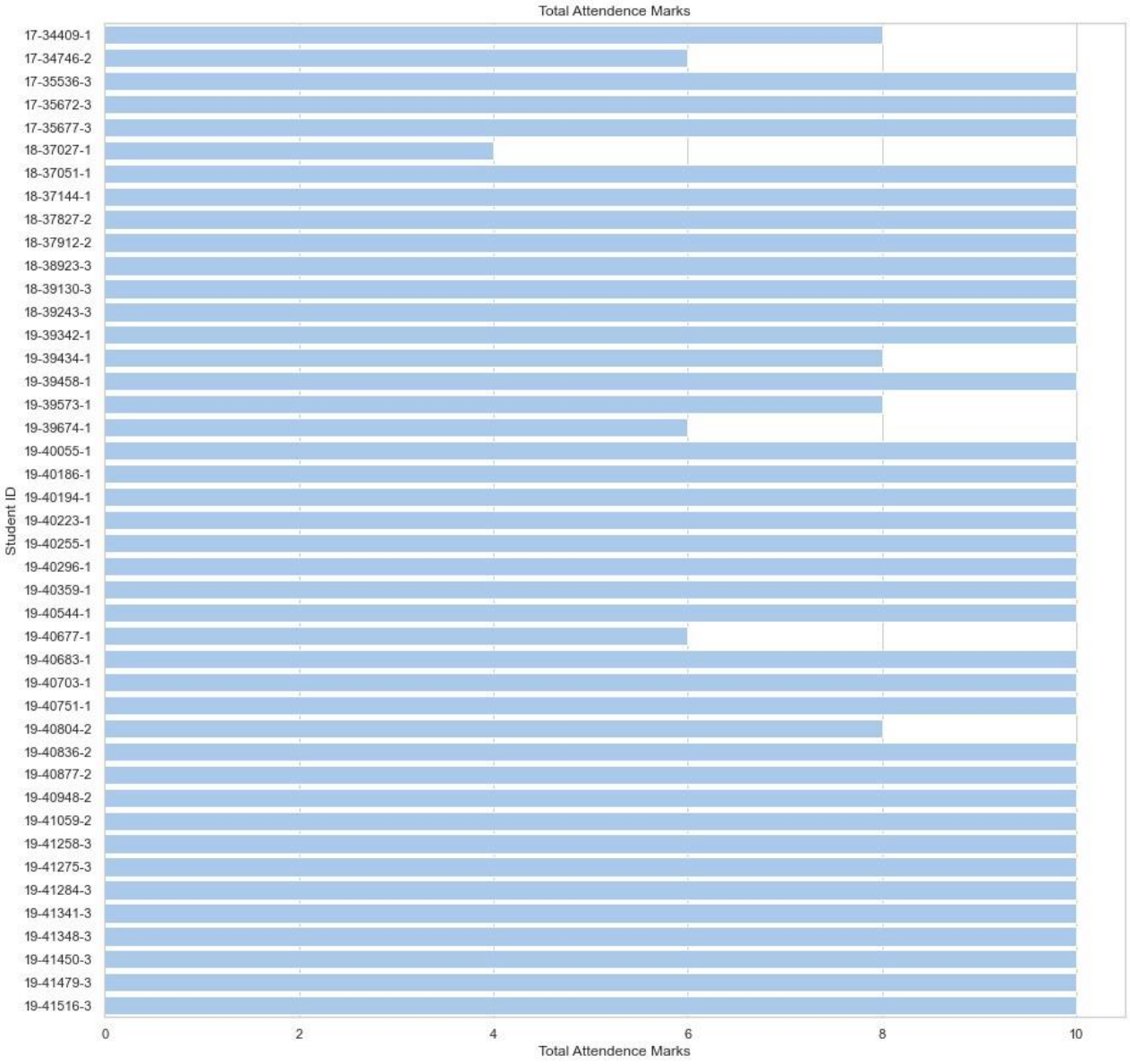


In [109…

```
sns.set_theme(style="whitegrid")

# Initialize the matplotlib figure f,
ax = plt.subplots(figsize=(15, 15))


# Plot the total dataset sns.set_color_codes("pastel")
barplot = sns.barplot(x=student_db["Total Attendence Marks"], y=student_db["Student ID"
label="Total", color="b") barplot.set(title="Total Attendence Marks") fig =
barplot.get_figure()
fig.savefig("Total Attendence Marks.png",dpi=300)
```

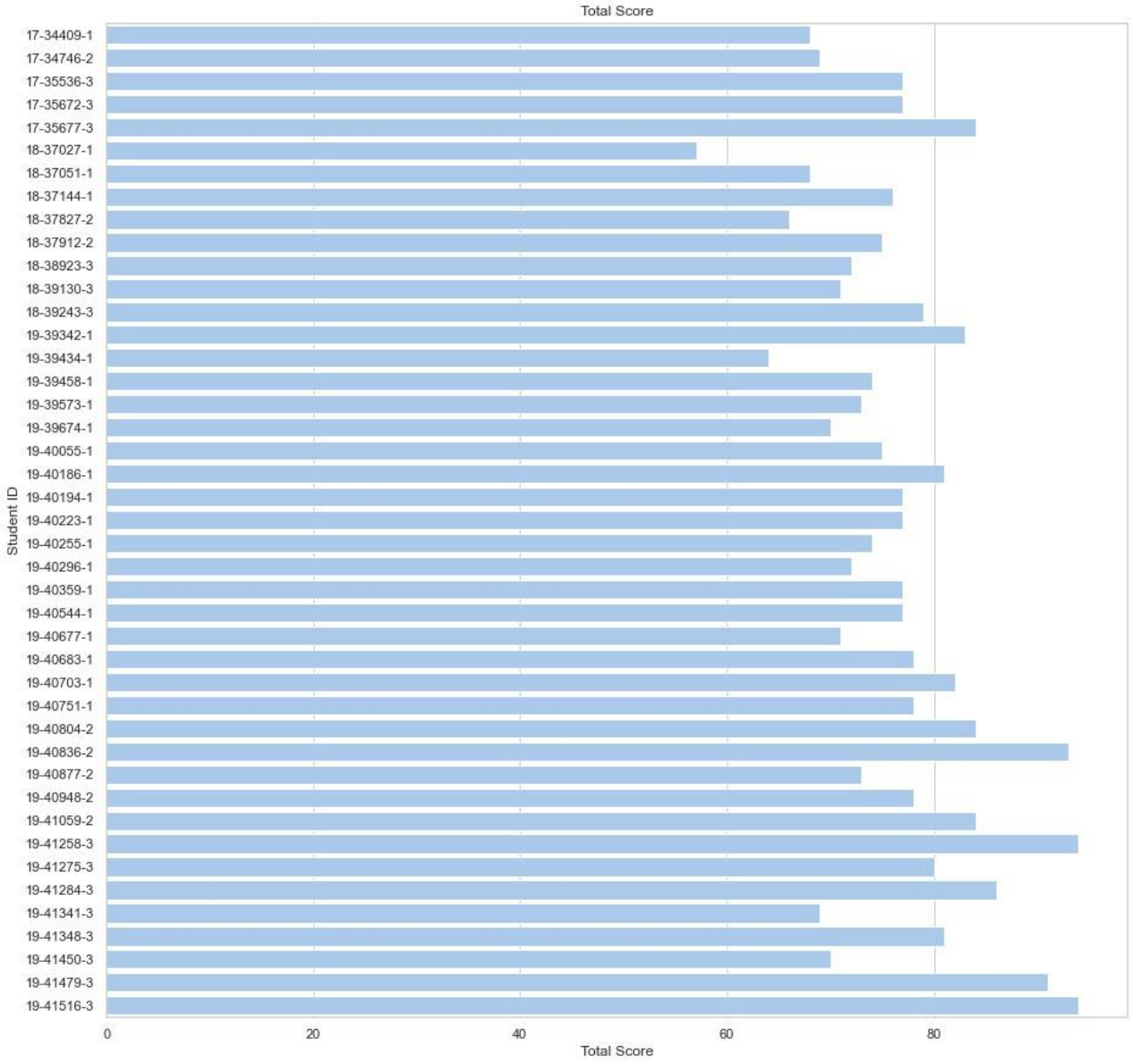


In [110…

```
sns.set_theme(style="whitegrid")

# Initialize the matplotlib figure f,
ax = plt.subplots(figsize=(15, 15))


# Plot the total dataset sns.set_color_codes("pastel")
barplot = sns.barplot(x=student_db["Total Score"], y=student_db["Student ID"],
label="Total", color="b") barplot.set(title="Total Score") fig =
barplot.get_figure() fig.savefig("Total Score",dpi=300)
```

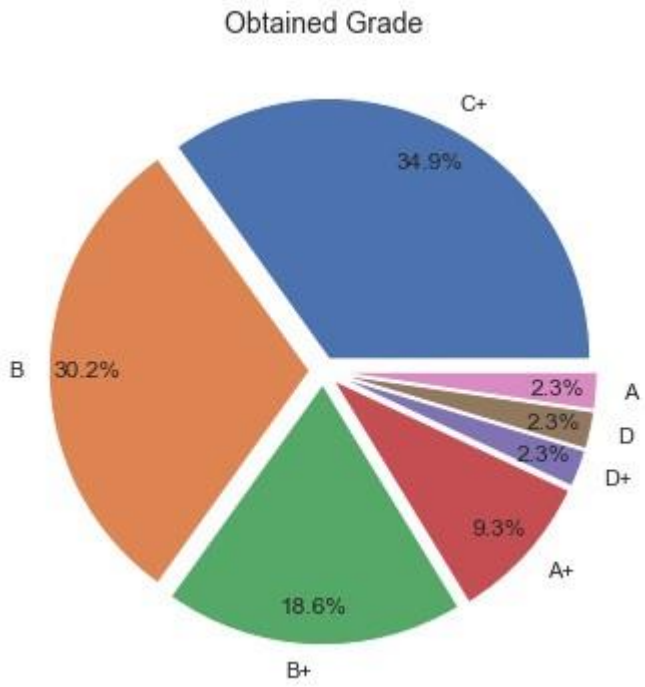


In [112…

```
grade_summary = student_db["Obtained Grade"].value_counts()
```

In [146…

```
#Using matplotlib
pie, ax = plt.subplots(figsize=[10,6]) labels
= grade_summary.keys()
plt.pie(x=grade_summary, autopct="%.1f%%", labels=labels, pctdistance=.85, explode=[0.0
plt.title("Obtained Grade", fontsize=14); pie.savefig("Obtained_grade.png",dpi=300)
```



In [ ]: