Analyzing Data Using Two Dimensions

This assignment provides a chance to practice with PIVOT() commands within SQL and Matrix tables within PowerBI. You are asked to analyze a dataset of the calories burned by different types of physical activities, ranging from cleaning to competitive sports. You are asked to prepare different suggested activity plans for people that want to track and increase their caloric burn. The amount of calories burned per hour for different activities was recorded for four different sample pools;  
  
a) subjects averaging 130 pounds,   
b) subjects averaging 155 pounds,  
c) subjects averaging 180 pounds,  
d) subjects averaging 205 pounds.

The data is on cb-ot-devst05.ad.wsu.edu. (Check DEVST06 as needed to find this table)  
User userID mfstudent and password BIanalyst.  
Text

Description automatically generated

Each measure represents a different group of people based on their average weight. Take a look at the data.

**Dimensions**

1. **Cardio Pace:** The cardio **pace** of the activities range widely and include easier activities such as playing darts, or horseshoes to quite difficult cardio activities such as participating in a competitive sport such as basketball game. The activities have been categorized into a **pace** **dimension** with the values;  
a) Easy, b) Steady, c) Vigorous, d) High Intensity.

You can verify these pace values using the following SQL statement. Recall that the SELECT DISTINCT command can retrieve a list of values from a database column and remove the duplicate values.  
USE [Featherman\_Analytics];  
SELECT DISTINCT [Pace] FROM [featherman].[Exercise]

2. **Category of activity:** The activities have also been classified into a **category dimension** with the values  
a) Activity (this category includes many different activities ranging from gardening, to playing with a child).  
b) Rec Center (these are exercise classes or activities that are often performed at a recreation center such as UREC).  
c) Sport (these are activities that are typically considered sports, such as skiing or soccer).

You can verify these categories with the following SQL statement   
USE [Featherman\_Analytics];  
SELECT DISTINCT [Category] FROM [featherman].[Exercise]

**3. Sport:**  
This is a true/false field used to filter activities by whether they are typically categorized as a sport (i.e., soccer) or non-sport (i.e., gardening). In the column the value true (is a sport) is recorded as a 1, false (the activity is not a sport) is recorded as a zero.

**Task**: You are developing a reputation as a person that can organize and analyze data and provide solutions and recommendations. Here have been asked by the manager of the Pullman Fitness Center (PFC) to provide four different training plans—one for each weight category—that recommend a set of activities. The hope is that by careful analysis, more optimal activity recommendations can be made. Members of the PFC are looking to record and increase their caloric burn for the day, and week. You have been given a list of activities and the amount of calories (at four different weight categories) that are burned after completing one hour of that activity.

You are asked to produce a list of recommendations for each weight category based on a two hours per day/six days per week schedule. You are asked to provide a suggested mix of activity categories and paces, and then provide the short list of 5 activities to pick from for those categories. Also provide the number of calories the person would likely burn per week. In summary, you are providing suggestions for a training plan for each of the four types of people that you have data for; a) for subjects averaging 130 pounds, b) subjects averaging 155 pounds, c) subjects averaging 180 pounds, d) subjects averaging 205 pounds. You can think of the assignment as repetitive doing the same task four times, once for each subject group.

Vary the activities by category, duration, and pace. The example below partially presents a set of MWF activities, T/TH Fitness center classes and activities, and weekend participation in sports activities. Be sure to vary the activities by Cardio Pace to mix up the effort level, for example some activities require only a steady pace but do burn a high amount of calories in an hour). You may choose to filter out the non-sports activities.

Table

Description automatically generatedTable

Description automatically generated**Procedure**:  
Use SQL PIVOT statements to analyze the **average caloric burn** for each combination of category and pace. Analyze the caloric burn per category. Choose a strategy that selects exercises and actions from the mix of category and pace (for example you may decide to recommend easy and steady sports, vigorous rec center actions, and high intensity activities). Show cropped screenshot images of your PIVOT tables, describing your findings and selections, and place the SQL syntax in the appendix. (You will have to do this for each weight group).  
  
For example if the results found were as shown in the image to the right (for a specific weight group), you might recommend an activity plan of MWF do 1 hour of a steady sport (420 calories burned) and 1 hour of a steady activity (425 calories burned). On T/TH do an hour of vigorous rec center activity (i.e., classes- 413 calories burned) and one hour of easy sports(349 calories burned). On Saturdays do 2 hours of vigorous sports (478 \* 2). Provide output in the following (or similar) format. Note this text was typed into Excel and is not the result of a pivot table or query, rather Excel was used to organize and total the data.)

Graphical user interface, text, application

Description automatically generatedNext provide a brief suggested list of activities for the week in the categories you have planned for the weight group. In general, provide the rationale for the activity plan explaining the proposed schedule, what activities are suggested and why. Note: There is not one perfect answer, rather your guidance. You will be doing the following four times (once for each weight group).  
  
a) provide a cropped image of the PIVOT results for that group (provide some analysis of them)  
b) provide the SQL statement used to generate that result (place in the appendix)  
c) provide the *Activity schedule* you plan for the weight group (provide your rationale for that schedule)  
d) provide a short list of actions that fit the Activity schedule. Note (the PIVOT results are averages so you may choose to provide a more specific action schedule based on the suggested activities). You are generating a list of suggested activities for rec center members, so give 3-5 options per suggested activity group (i.e. Choose gardening, walking, or playing with a child for the easy activities on MWF).  
e) Tie the images and activities together into an Activity Recommendation Plan and description such as “To hit the goal of 5000 calories burned per week, we suggest the following activities as follows…”

**You are creating four different activity plans, one for each weight group.**

**Final note**: At the end of the document provide your thoughts as to two threats to the validity of the recommendations.  
List two problems that might be evident with the data in the dataset, which would call into question the validity of your analysis and recommendations for activity plans.

Upload your report to the content management system. You have complete design authority to produce the output requested. Better grades for completeness, thoughtfulness, and formatting. Keep reports in the 4-7 page range including images and the appendix of SQL.