Data Science Career Track
Guided Capstone - Step One: Problem Identification

The first step of this guided capstone is all about identifying the correct problem to solve. Let's get to it!

Project Steps

1. Read the Guided Capstone Overview to learn about the company you are 'working' for.
2. Read the information about each of the problem statement worksheet sections.
3. Fill out a problem statement worksheet for this project. Your answers should be based on the information you learned while reading the overview and subsequent sections.
4. Save your problem statement worksheet with the title [Your Name] PSW - Guided Capstone.
    a. If you've filled out your worksheet in a Google doc, be sure to set the Share settings to 'anyone with a link can view' so that your mentor can review your work.
5. Submit a link to your completed problem statement worksheet and discuss it with your mentor during your next call.

Guided Capstone Project Overview + Context

You are working with Big Mountain Resort, located in northwestern Montana. Big Mountain Resort offers spectacular views of Glacier National Park and Flathead National Forest. The resort originally opened in 1947 with an annual snowfall of 333 inches and 3,000 acres of skier and rider accessible terrain. Big Mountain Resort offers access to 105 named trails and vast bowl and tree skiing. All these are serviced by 11 lifts, 2 T-bars and 1 magic carpet for novice skiers. The longest run is named Hellfire and is 3.3 miles in length. The base elevation is 4,464 feet, and the summit is 6,817 feet with a vertical drop of 2,353 feet.

With a terrain rating of 12% beginner, 38% intermediate, 44% advanced and 6% expert, this mountain can accommodate skiers and riders of all levels and abilities.

Big Mountain Resort has recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increases their operating costs by $1,540,000 this season. Every year about 350,000 people ski or snowboard at Big Mountain. This business profit margin is 9.2% and the investors would like to keep it there. The business is eager to get your recommendations on recouping the increased operating costs from the new chair this season. Additionally, what can they expect this years' annual revenue to be if they make the changes you recommend?

Problem Statement Worksheet Sections

What is the business problem you're investigating and what hypothesis can be made to support the business outcome?

Tip: Review the last paragraph of the overview and generate ideas about how to increase revenue for the resort. Once you have an idea or two, use the data overview provided below to determine if your idea can be evaluated and supported by these data. Keep in mind that this data contains information from 330 resorts in the US that can be considered part of the same market share and we have these same data columns for Big Mountain Resort as well.

Write your response in your problem statement worksheet.

Context

Here is where we define our business initiative to solve the problem the business is suffering from.

Write your response in your problem statement worksheet.

Criteria for success

This is a key step in any business problem or data science project. Knowing what the outcome expectations are and communicating those clearly to all involved stakeholders will set you up to succeed. In the absence of clearly defined success criteria and scope, it can be difficult to identify when the project is complete.

Write your response in your problem statement worksheet.

Scope of solution space

The solution space provides more details about the tasks you will complete to reach the solution.

Write your response in your problem statement worksheet.

Constraints

The constraints section helps you, the data science practitioner, communicate anticipated conflict in implementing recommendations or findings of the project. Take a moment to consider what potential issues could arise when presenting your recommendations to the key stakeholders.

Write your response in your problem statement worksheet.

Stakeholders

Identifying the key stakeholders in your project motivates the trajectory of your work and gives you access to key insights and data to support your analysis. Mapping out all the people with vested interests in your project outcome will help you build the network needed to complete the project, as well as provide an audience to address when writing your data story.

In this project, you're working directly with the Director of Operations, Jimmy Blackburn, and he has connected you with Alesha Eisen, the Database Manager. These are you're only two contacts for this project.

Write your response in your problem statement worksheet.

Data Source(s)

Gaining access to the proper data sources can be difficult — perhaps you need a specific user level access granted to a SQL database or an S3 bucket. In this example, you'll work with a single CSV file that you got from the database manager. You need to carefully review the data columns to ensure it has what you need to answer your business question. The data is loaded below; use this data snippet along with the column descriptions in the metadata to guide you in identifying the important columns needed to complete this project.

Review the metadata file with column descriptions (below).

Column	Description
Name	The name of the ski resort.
Region	The region within the United States where the resort is located.
state	The state name where the resort is located.
summit_elev	Elevation in feet of the summit mountain at the resort.
vertical_drop	Vertical change in elevation from the summit to the base in feet.
base_elev	Elevation in feet at the base of the resort.
trams	The number of trams.
fastEight	The number of fast eight person chairs.
fastSixes	The number of fast six person chairs.
fastQuads	The number of fast four person chairs.
quad	Count of regular speed four person chairlifts.
triple	Count of regular speed three person chairlifts.
double	Count of regular speed two person chairlifts.
surface	Count of regular speed single person chairlifts.
total_chairs	Sum of all the chairlifts at the resort.
Runs	Count of the number of runs on the resort.
TerrainParks	Count of the number of terrain parks at the resort.
LongestRun_mi	Length of the longest run in the resort in miles.
SkiableTerrain_ac	Total skiable area in square acres.
Snow Making_ac	Total area covered by snow making machines in acres.
daysOpenLastYear	Total number of days open last year.
yearsOpen	Total number of years the resort has been open.
averageSnowfall	Average annual snowfall at the resort in inches.
AdultWeekday	Cost of an adult weekday chairlift ticket.
AdultWeekend	Cost of an adult weekend chairlift ticket.
projectedDaysOpen	Projected days open in the upcoming season.
NightSkiing_ac	Total skiable area covered in lights for night skiing.

For more context, a data snippet is provided below.

	Name	Region	state	summit_elev	vertical_drop	base_elev	trams	fastEight	fastSixes	fastQuads	quad	triple	double	surface	total_chairs	Runs
0	Alyeska Resort	Alaska	Alaska	3939	2500	250	1	0.0	0	2	2	0	0	2	7	76.0
1	Eaglecrest Ski Area	Alaska	Alaska	2600	1540	1200	0	0.0	0	0	0	0	4	0	4	36.0
2	Hilltop Ski Area	Alaska	Alaska	2090	294	1796	0	0.0	0	0	0	1	0	2	3	13.0
3	Arizona Snowbowl	Arizona	Arizona	11500	2300	9200	0	0.0	1	0	2	2	1	2	8	55.0
4	Sunrise Park Resort	Arizona	Arizona	11100	1800	9200	0	NaN	0	1	2	3	1	0	7	65.0

TerrainParks	LongestRun_mi	SkiableTerrain_ac	Snow Making_ac	daysOpenLastYear	yearsOpen	averageSnowfall	AdultWeekday	AdultWeekend	projectedDaysOpen
2.0	1.0	1610.0	113.0	150.0	60.0	669.0	65.0	85.0	150.0
1.0	2.0	640.0	60.0	45.0	44.0	350.0	47.0	53.0	90.0
1.0	1.0	30.0	30.0	150.0	36.0	69.0	30.0	34.0	152.0
4.0	2.0	777.0	104.0	122.0	81.0	260.0	89.0	89.0	122.0
2.0	1.2	800.0	80.0	115.0	49.0	250.0	74.0	78.0	104.0