Cost Analysis Report for Painting Steps in the UT Tyler Campus

1. Abstract:

This comprehensive report combines detailed cost analysis and procedural guidelines for the proposed project of painting all steps across the UT Tyler campus in alternating blue and orange colors. The report includes data on step distribution, material types, paint requirements, labor costs, equipment needs, and other relevant factors, providing a thorough understanding of the project's scope, costs, and execution plan.

2. Introduction:

The UT Tyler administration has launched a campus beautification initiative, with the ambitious goal of painting all stairs across campus in alternating blue and orange colors. This project is a determined attempt to improve the visual attractiveness and aesthetic liveliness of the university campus. The detailed analysis offered here provides a foundation for assessing the budgetary concerns, resource allocations, and procedural complexities associated with carrying out this colossal painting endeavor.

This study aims to provide a full overview and extensive cost analysis by thoroughly assessing numerous characteristics such as step distribution, material kinds, paint coverage requirements, labor costs, and equipment prices. An in-depth assessment of these important aspects can provide decision-makers and stakeholders with significant information for informed decision-making and strategic planning. The combination of extensive cost analysis and procedural guidance in this report is intended to promote a complete knowledge of the financial consequences and resource requirements involved with the campus beautification project, eventually directing efficient and successful project implementation.

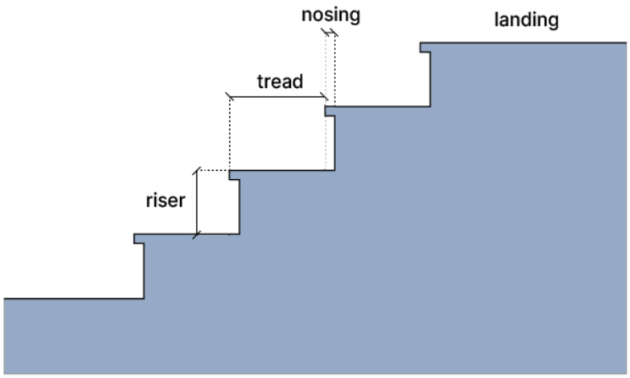
3. Definition of a Step:

A step, in the context of architecture and construction, is a horizontal, flat surface facilitating elevation change within a structure. It consists of three main parts: the tread, riser, and nosing. A landing is also considered part of the staircase structure, providing a lengthier horizontal surface between flights of stairs or at the top or bottom of a staircase. The area of a step, including landings, can be calculated using the Blondel formula.

Blondel Formula:
$A = (2 \times R + T) \times R$

Where:

- A = Area of the step
- R = Riser height (vertical height of each step)
- T = Tread depth (horizontal depth of each step)



4. Data Collection:

For the comprehensive collection of data regarding the steps present across the university campus, we engaged the services of a proficient contractor. This contractor, equipped with a team of 10 skilled individuals, meticulously surveyed the entire campus, diligently measuring and cataloging the numerous steps dispersed throughout various sectors. To verify and ensure the accuracy of the data collected, we utilized Fire Exit floor plans for a few buildings, which were available to us. These floor plans, essential for safety regulations, undergo annual updates. The integration of these floor plans, along with publicly available data pertaining to the university's map, albeit slightly outdated, allowed for a comprehensive assessment of the campus's step infrastructure. Over the course of approximately one week, the contractor's team traversed the campus, meticulously recording the quantity and types of steps encountered within each sector. The result of this collaborative endeavor is the detailed tabular data presented, encapsulating the myriad steps and their respective materials constituting the campus landscape.

In addition to the comprehensive data collected by our contractor, we have organized the raw data in Excel sheets, comprising three main tables. These tables contain detailed information categorized by building and area names, indicating whether the steps are located indoors or outdoors. Additionally, the tables provide data on the material composition, dimensions, and exact location of each step. The number of steps in each area is also included in the dataset. Furthermore, to ensure the accuracy of our findings, we utilized Emergency floor plans obtained

from PDF files. These floor plans were instrumental in verifying and cross-referencing the data collected during the survey.

Nursing Addition:
In order to collect the number of steps present in this nursing addition we are using

Surface Area Formula in Raw Data:
=(E5*(((F5*G5)/144)+(F5*H5/144)))-(F5*H5/144) in square feet
E5 is Number of Steps
F5 is Length
G5 is Height
H5 is Width in inches

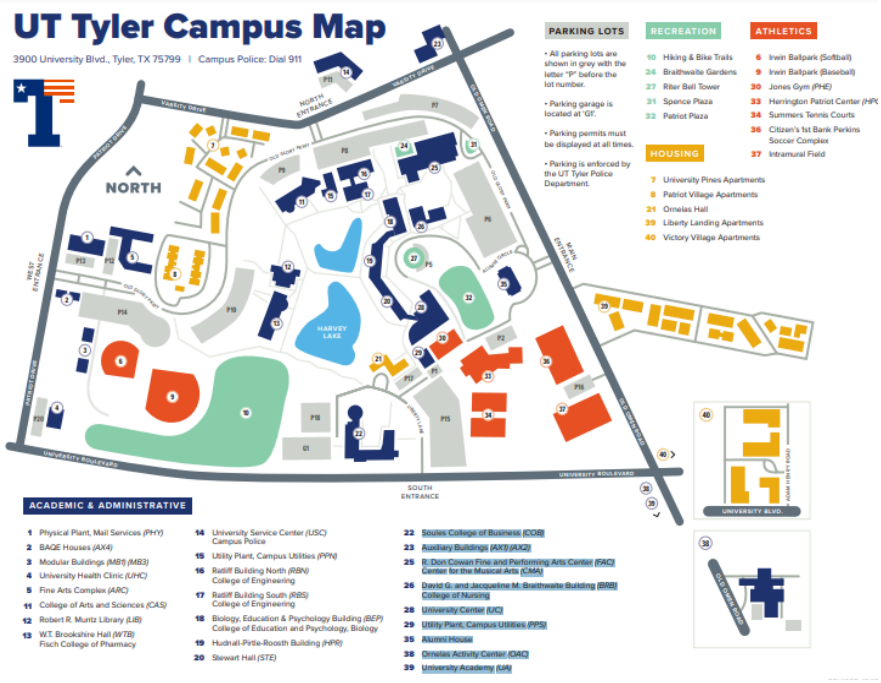
Formula subtracts the landing of the top step.

Raw Data:
https://docs.google.com/spreadsheets/d/1vqp0tTECXFgBaZhwil65qpVchtl5sUToDN_r9yBO5oo/edit?usp=sharing

Reference images to pinpoint staircase using floor plans:
https://drive.google.com/file/d/1IaOhSpKJHrHf6F1wDBic9YyhKMPl4Swc/view?usp=drive_link
Note: Each image is a floor plan of individual <Building Name> from the Raw Data.Buildings Table above. Labels are made in the link on each staircase and they represent <Staircase> column in the Buildings Table for each <Building Name>.

5. Campus Boundaries and Step Distribution:

In our endeavor to comprehensively understand the step distribution across the UT Tyler campus, we embarked on a meticulous data collection process. Utilizing a combination of on-site surveys conducted by a contracted team of specialists and the available university map, albeit outdated, we endeavored to paint an accurate picture of the campus's step infrastructure. The contracted team, comprising ten dedicated individuals, diligently surveyed various sectors of the main campus, including Soules College of Business, Riter Tower, Patriot Plaza, RBN, RBS, University Pines, Patriot Village Apartments, Liberty Landing Apartments, and Parking Lot G1. The detailed data gathered provides insight into the distribution of steps within each sector.



This comprehensive data set, derived from both on-site surveys and the university map, provides valuable insights into the step distribution across the UT Tyler campus, facilitating informed decision-making regarding campus infrastructure and accessibility.

6. Database Schema:

Project:

- Start_date - DATE
- End_date -DATE
- No_of_hours (to be worked) - DECIMAL
- Budget - DECIMAL

Building:

- Building_Name - VARCHAR
- Type_of_Building - Academic, Administrative, Recreational, Housing, Athletics, Parking lots - VARCHAR
- Number_of_Floors - DECIMAL
- Material - Wooden, Metallic, Rubber, Concrete, Ceramic, and Carpet - VARCHAR

- Number_of_Staircases_per_floor - DECIMAL
- Length(inches) - DECIMAL
- Height(inches) - DECIMAL
- Width(inches) - DECIMAL
- Surface Area in square foot per staircase - DECIMAL

<Table in Raw Data.Buildings Table>

Steps:

- Type_of_Step - Wooden, Metallic, Rubber, Concrete, Ceramic, and Carpet - VARCHAR
- Step_located - Inside, Outside (Assuming inside steps and outside steps are different regardless of material) - VARCHAR
- Number_of_steps - DECIMAL
- Primer_needed - yes/no - BOOLEAN
- Sanding_needed - yes/no - BOOLEAN
- No_of_Coats_needed - DECIMAL
- Paint_type - acrylic latex paint (for metal), water-based paint (for Fabric/Carpet), oil-based paint (for wood and ceramic) - VARCHAR

Type_of_Step	Step_located	No_of_steps	Primer_needed	Sanding_needed	No_of_Coats_needed	Paint_type
Wooden	Inside	5	1	0	3	oil-based paint
Metallic	Inside	212	1	0	3	acrylic latex paint
Rubber	Inside	848	1	0	2	acrylic latex paint
Concrete	Inside	382	1	0	4	acrylic latex paint
Ceramic	Inside	432	1	0	2	oil-based paint
Carpet	Inside	212	1	0	2	water-based paint
Concrete	Outside	467	1	0	5	acrylic latex paint

Paint:

- Paint_type - acrylic latex paint (for metal and concrete), water-based paint (for Fabric/Carpet), oil-based paint (for wood and ceramic) - VARCHAR
- Quantity_of_paint (in Gallons) - DECIMAL
- Price_per_Gallon(for each paint type) - DECIMAL

- Type_of_tool - VARCHAR

Paint_type	Quantity_of_paint (in gallons)	Price_per_Gallon (in Dollars)	Type_of_tool
acrylic latex paint	144.70	$ 30.00	Polyester brushes
oil-based paint	15.69	$ 40.00	Polyester brushes
water-based paint	19.48	$ 30.00	Polyester brushes
Primer	62.32	$ 15.00	Polyester brushes

Quantity_of_paint [Paint_type]= (Total surface area [Paint_type] x No. of coats needed / 400

For example, Quantity of Acrylic latex paint = Surface area of Metal stairs x 4 (No of coats needed) + Surface area of Rubber stairs x 4 + Surface area of Concrete inside stairs x 5 + Surface area of Concrete outside stairs x 6) / 400 (Surface area in square feet that can be painted for one gallon of paint) = 57,880 square feet
For primer, Quantity_of_paint = Total surface area / 400

Color	Paint_color_codes
Blue	#082c6c
Orange	#d06414

Labor:

- Labor_type: In-house Maintenance staff, outside contractor, Volunteer - VARCHAR
- Rate_per_hour (in Dollars) - DECIMAL
- Amount_of_workers (working simultaneously) - DECIMAL
- Number_of_hours (of work per day) - DECIMAL

Labor_type	Rate_per_hour (in Dollars)	Amount_of_workers	Number_of_hours (per day)
Contractor	$ 15.00	10	8
Volunteer	$ 0	0	8
Maintenance	$ 15.00	0	8

Tools:

- Type_of_tool: Roller, Paint brush, sprayer, tape, Sand block, misc(cloth and stuff) - VARCHAR
- No_of_items_needed - NUMERIC
- Average_time_needed_to_paint (a square foot of step) - DECIMAL
- Durability (No. of square feet it lasts) - DECIMAL

Type_of_tool	No_of_items_needed	Average_time_needed (in minutes for a square foot of step)	Cost (per piece)
Polyester brushes	50	0.6	$ 17.00
Cloth	100	0	$ 2.00
Tape	500	0.1	$ 2.00

Assumptions:

1. No sanding needed because high quality primer is going to be used
2. Removing redundant tools and using only polyester brushes to paint
3. Using only outside contractors to work assuming maintenance staff is busy and no volunteers
4. Buying expensive brushes that last more than a year. If so, total number of brushes needed simultaneously will be 10 if assuming 10 workers are working at a time.
5. As a rough estimate, a skilled professional painter might be able to paint approximately 75 to 150 square feet per hour with a brush, in general. This translates to roughly 0.4 to 0.8 minutes per square foot. Average would be 0.6 minutes per square foot
6. Using rates from Lowe's for paint and tools
7. Assuming 500 pieces of tapes are enough
8. Assuming price of paint of orange and blue is the same
9. Landings on a staircase that are lengthier than the staircase's step length will be painted only to the length of all the other steps.
10. One Gallon of paint works for 400 square feet.
11. Floor plans for COB are not available to cross verify the data collected
12. Auditorium rooms were registered in the study. But they will not be painted.
13. Any inaccessible/rarely used emergency stairs (e.g., the ones in the library), are not considered to paint.

Relationships:

- Steps.Paint_type references Paint.Paint_type
- Paint.Type_of_tool references Tools.Type_of_tool
- Building.Type_of_Steps references Steps.Type_of_Step

7. Library Assessment (Step 5):

Total number of steps fetched from raw data belonging to each building:

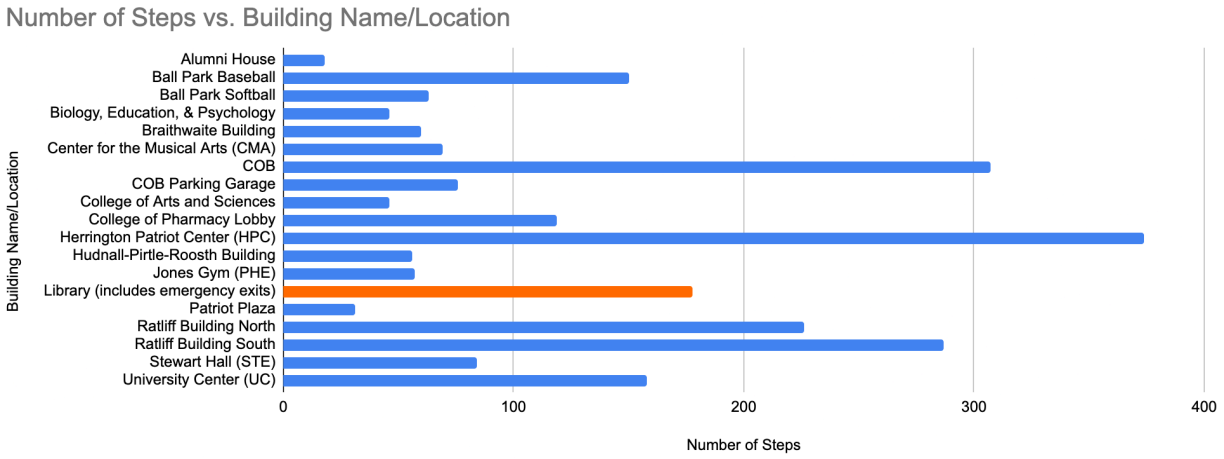
Building Name/Location	Number of Steps
Alumni House	18
Ball Park Baseball	150
Ball Park Softball	63
Biology, Education, & Psychology	46
Braithwaite Building	60
Center for the Musical Arts (CMA)	69
COB	307
COB Parking Garage	76
College of Arts and Sciences	46
College of Pharmacy Lobby	119
Herrington Patriot Center (HPC)	374
Hudnall-Pirtle-Roosth Building	56
Jones Gym (PHE)	57
Library (includes emergency exits)	188
Patriot Plaza	31
Ratliff Building North	226
Ratliff Building South	287
Stewart Hall (STE)	84
University Center (UC)	158

The Library has 3 staircases upon assessment. The main staircase has 73 steps. The West Emergency Exit staircase has 46 steps and East Emergency staircase has 69 steps which totals 188 steps in the library building.

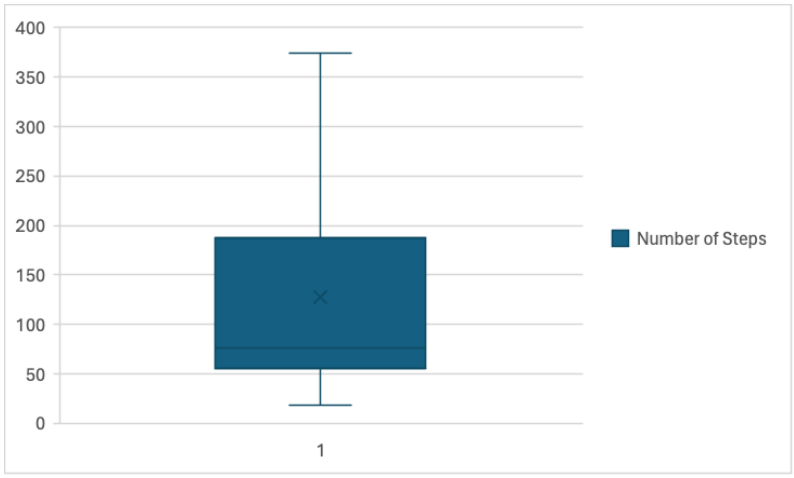
Note 1: Outside steps are ambiguous to attribute to any individual buildings particularly when it lies exactly in between two buildings. Any outside steps are not being considered in this assessment.

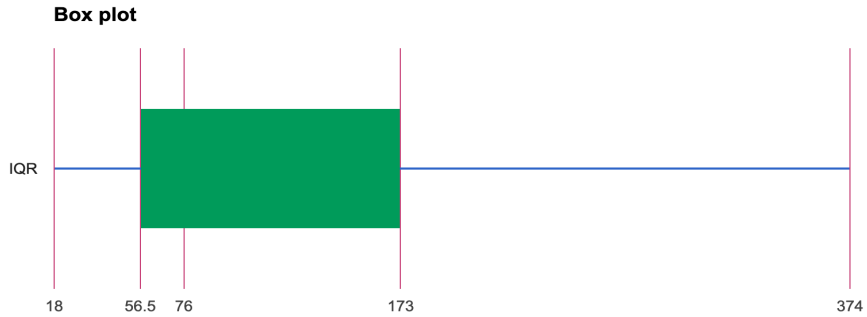
Note 2: West emergency stairs are restricted to the upper floors and the first floor is inaccessible. Discounting the first floor, we have 46 steps.

Bar Plot:



Box plot: The box plot below shows that the **mean** lies at **127** and the **median** at **76**(which is the 50th percentile). That means that the average number of steps of all buildings is approximately 127 steps. But the library has 188 steps which is also greater than the 75th percentile. That means it has more steps than 75% of the buildings.
The IQR is 116.5 steps which means 50% of the buildings have steps between 56.5 and 173
And a long whisker at the top means that 374 creates right skewness in the distribution and can be considered an outlier.



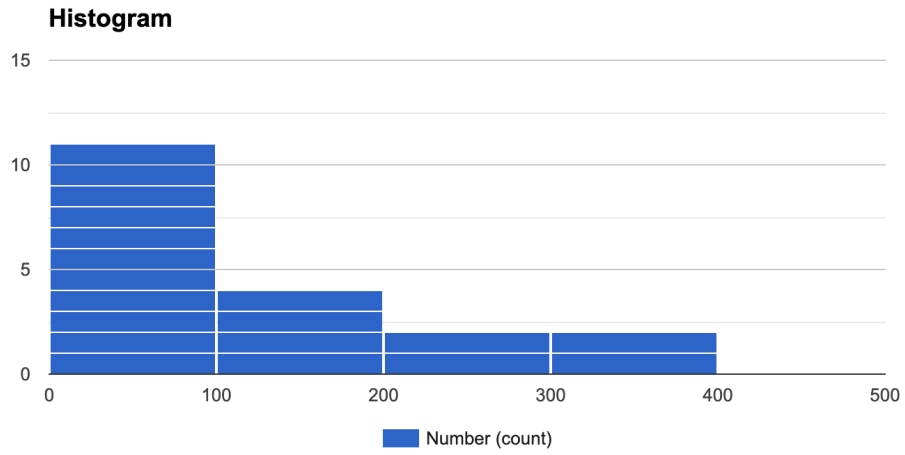


Descriptive Statistics of ‘No of Steps’ of each building:

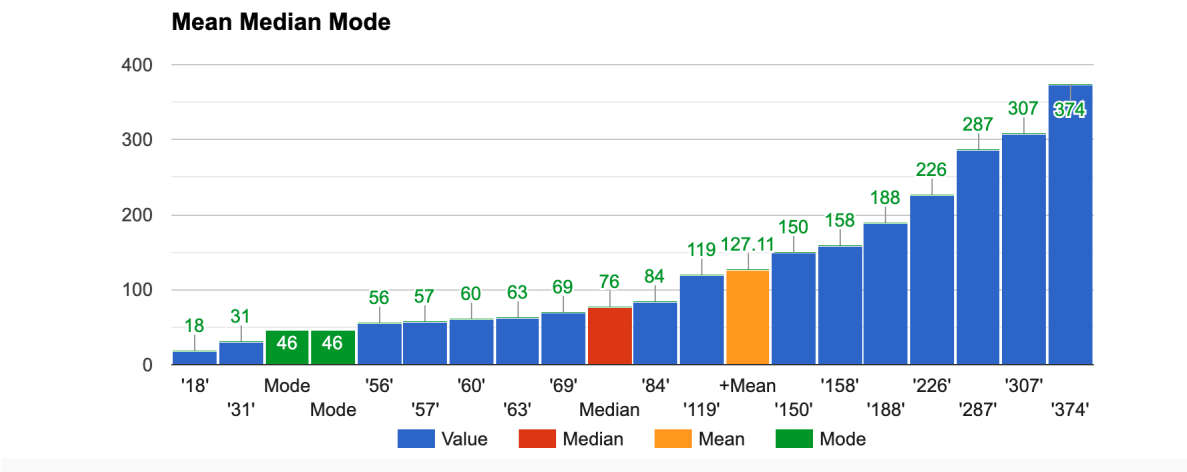
Mean (Average)	**127.1053**
Median (Q2)	**76**
Mode	**46** (appears 2 times)
Count (n)	19
Lower quartile (Q1)	56.5
Upper quartile (Q3)	173
Interquartile range (IQR)	116.5
Range	356
Minimum	18
Maximum	374
Outliers	374

Standard deviation of the population: 101.21

Histogram:



The Histogram plots the number of steps in intervals of 100 for each building with most buildings having <100 steps. There is an apparent right skewness in the plot which suggests outliers in the data.



Comparing with the Median:

The median, which represents the midpoint of the dataset, is 76.0 steps. This means that half of the buildings have fewer than 76 steps, and the other half has more.
The Library's number of steps, 188, surpasses this median. This indicates that the Library requires more steps to traverse than the middle point of all buildings.

Comparing with the Mean:

The mean or average number of steps across all buildings is 127 steps. This value takes into account the total number of steps across all buildings and divides it by the total number of buildings. The library has more steps than the mean.

In conclusion, when analyzing the Library's number of steps in relation to other campus buildings, it's evident that it exceeds both the median and mean values derived from the dataset. However, a deeper examination reveals a more nuanced perspective. Initially, the Library's step count of 188 may imply a higher-than-average number compared to its counterparts. Yet, this perception is shaped significantly by the presence of designated fire exit staircases. Unlike many buildings where emergency staircases serve dual roles for everyday navigation and emergencies, the Library's emergency exit stairs are specifically tailored for critical situations like fires or tornadoes. Furthermore, the main staircase within the Library primarily facilitates routine navigation between floors.

8. Paint Required for new Nursing Building (Step 6)

Input Data:
https://docs.google.com/spreadsheets/d/1vqp0tTECXFgBaZhwil65qpVchtI5sUToDN_r9yBO5oo/edit#gid=860792435

Sheets: 'Step 6 Data' and 'Step 6 Surface Area'

Note: Data Description is mentioned in the referenced spreadsheet

Below is Input data passed as the csv file to our Linear Regression Model.

Building	Number of floors	Steps	Material Used
Alumni House	2	18	0
Biology, Education, & Psychology SC1	2	23	1
Biology, Education, & Psychology SC2	2	23	1
Braithwaite Building SC1	2	30	2
Braithwaite Building SC2	2	30	2
Center for the Musical Arts (CMA) SC1	2	31	3
Center for the Musical Arts (CMA) SC2	2	31	3
COB SC1	2	36	4
COB SC2	2	31	2
COB SC3	4	120	2
COB SC4	4	120	2
College of Arts and Sciences SC1	2	23	1
College of Arts and Sciences SC2	2	23	1
College of Pharmacy SC1	2	28	4
College of Pharmacy SC2	3	59	2
Herrington Patriot Center (HPC) SC1	3	52	5
Herrington Patriot Center (HPC) SC2	3	52	5
Herrington Patriot Center (HPC) SC3	3	60	2
Herrington Patriot Center (HPC) SC4	3	60	2
Herrington Patriot Center (HPC) SC5	2	26	5

Herrington Patriot Center (HPC) SC6	2	26	5
Herrington Patriot Center (HPC) SC7	3	47	5
Herrington Patriot Center (HPC) SC8	2	23	5
Herrington Patriot Center (HPC) SC9	2	28	5
Hudnall-Pirtle-Roosth Building SC1	2	33	3
Hudnall-Pirtle-Roosth Building SC2	2	23	3
Jones Gym (PHE) SC1	2	21	6
Jones Gym (PHE) SC2	2	28	6
Library	4	73	5
Ratliff Building North SC1	4	80	2
Ratliff Building North SC2	3	55	2
Ratliff Building North SC3	4	91	1
Ratliff Building South SC1	4	105	2
Ratliff Building South SC2	4	91	2
Ratliff Building South SC3	4	91	1
Stewart Hall (STE) SC1	3	42	3
Stewart Hall (STE) SC2	3	42	3
University Center (UC) SC1	2	26	1
University Center (UC) SC2	2	27	1
University Center (UC) SC3	2	23	1
University Center (UC) SC4	2	23	1
University Center (UC) SC5	2	28	1
University Center (UC) SC6	2	27	1

Linear Regression Model:

```
building_data = read.csv(file.choose(), header = TRUE)
str(building_data)
summary(building_data)
model <- lm(Steps ~ Number.of.floors, data = building_data)
summary(model)
new_building_stories <- 2
new_building_prediction <- predict(model, newdata = data.frame(Number.of.floors =
new_building_stories))
print(new_building_prediction)
```

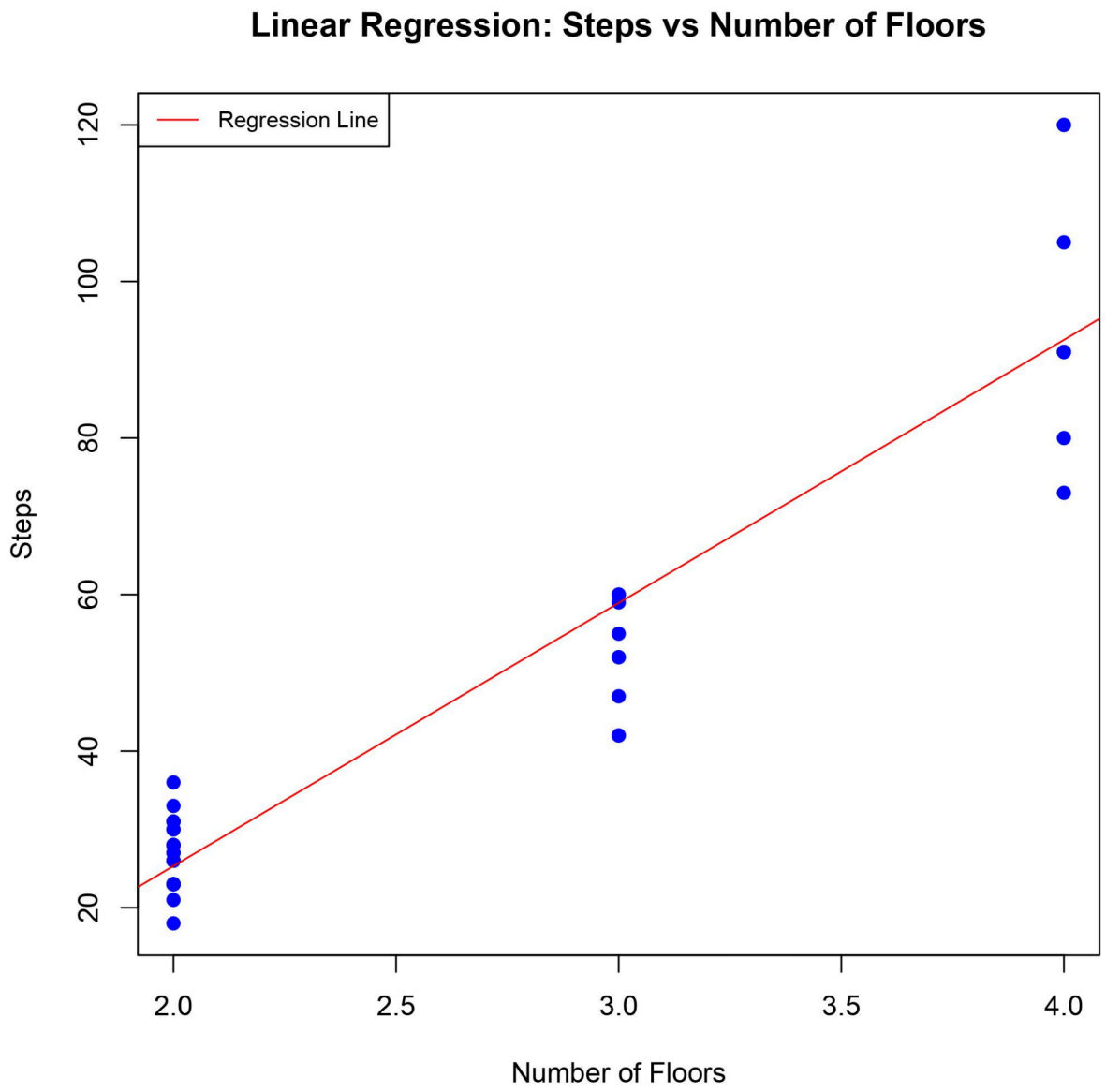
Output:

```
> str(building_data)
'data.frame':    43 obs. of  3 variables:
 $ Building        : chr  "Alumni House" "Biology, Education, & Psychology SC1" "Biology,
Education, & Psychology SC2" "Braithwaite Building SC1" ...
 $ Number.of.floors: int  2 2 2 2 2 2 2 2 2 4 ...
 $ Steps           : int  18 23 23 30 30 31 31 36 31 120 ...
> summary(building_data)
   Building         Number.of.floors     Steps
 Length:43          Min.   :2.000    Min.   : 18.00
 Class :character   1st Qu.:2.000    1st Qu.: 26.00
 Mode  :character   Median :2.000    Median : 31.00
                    Mean   :2.581    Mean   : 44.86
                    3rd Qu.:3.000    3rd Qu.: 57.00
                    Max.   :4.000    Max.   :120.00
> model <- lm(Steps ~ Number.of.floors, data = building_data)
> summary(model)

Call:
lm(formula = Steps ~ Number.of.floors, data = building_data)

Residuals:
    Min      1Q  Median      3Q     Max
-19.5395  -2.3199   0.0703   2.6801  27.4605

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       -41.900      4.848  -8.643 8.84e-11 ***
Number.of.floors   33.610      1.797  18.704  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 9.244 on 41 degrees of freedom
Multiple R-squared:  0.8951,  Adjusted R-squared:  0.8925
F-statistic: 349.8 on 1 and 41 DF,  p-value: < 2.2e-16

> new_building_stories <- 2
> new_building_prediction <- predict(model, newdata = data.frame(Number.of.floors =
new_building_stories))
> print(new_building_prediction)
25.31986
```

Summary of Results:

- The regression equation obtained is: Steps = -41.900 + 33.610 * Number.of.floors.
- The coefficient for the number of floors is statistically significant ($p < 0.001$).
- The R-squared value of the model is 0.8951, indicating that 89.51% of the variance in the number of steps is explained by the number of floors.
- For a new building with 2 floors, the predicted number of steps is approximately 25.32.

This is the plot for the above linear regression model.



Total Surface Area:

If stairs in the building are decided to be made of a certain material, we can select the specific material from the above list and use the corresponding average dimensions for that material.

Material	AVERAGE of Width(inches)	AVERAGE of Height(inches)	AVERAGE of Length(inches)
Carpet	41.07142857	26.03571429	28.64285714
Ceramic	63.78846154	6.615384615	36.71153846
Concrete_inside	58.3125	6.104166667	16.97916667
Concrete_outside	72.065	7.491527778	49.46111111
Metal	57.79166667	5.645833333	13.125
Rubber	47.03846154	12.14076923	33.63461538
Stone	60.75	6.25	12.3125
Tile	69	7	11
Wood	75	8.5	9
Grand Total	**61.73816327**	**8.895663265**	**33.80076531**

Amount of Paint Required for each respective material to be used:

Material to be used	**Paint needed in Gallons(depending on type of Material used)**
Carpet	3.337049143
Ceramic	4.487210948
Concrete_inside	3.797712915
Concrete_outside	17.07879453
Metal	2.168273926
Rubber	3.455678239
Stone	1.43218316
Tile	1.451388889
Wood	1.95703125

Assumptions:

- Linear regression is well-suited for our purposes, hence we didn't considered other models
- Different materials have different size in length, height, and width. So calculation for each is in the pivot table sheet 'Step 6 Material' in Raw Data
- Only one staircase. If more, multiply the 'Paint needed in Gallons' by however many staircases
- Formula Used: Surface area (in Square Feet) = Width(in Inches)*Length(in Inches)/144 + Height(in Inches)*Length(in Inches)/144
- Formula Used: Paint in Gallons = Total Surface Area of all stairs (in sqft) (in Raw Data Worksheet) * No_of_coats_needed(from Paint table)/400
- One gallon of paint covers 400 sqft

9. Calculation of Steps:

To calculate the area of each type of step that needs to be painted or dyed, we'll use the Blondel Formula to determine the ideal dimensions for each step. Then, we'll multiply these dimensions by the number of steps of each type to find the total area to be painted or dyed.

As per the Raw Data.Pivot Table1, and the formula
Surface Area Formula in Raw Data as per Blondel Formula:
=(E5*(((F5*G5)/144)+(F5*H5/144)))-(F5*H5/144) in square feet
E5 is Number of Steps
F5 is Length
G5 is Height
H5 is Width in inches

Formula subtracts the landing of the top step.

We get the Number of steps categorized by material of the step:

	SUM of
	0
Carpet	212
Ceramic	432
Concrete_inside	382
Concrete_outsid	467
Metal	212
Rubber	848
Stone	64
Tile	49
Wood	5
Grand Total	**2671**

And the Total Surface area of all the steps categorized by material of the step (in square feet)

	SUM of
	0
Carpet	3896.655816
Ceramic	3078.309028
Concrete_inside	2894.818142
Concrete_outsid	5500.258401
Metal	1564.381944
Rubber	7052.667014
Stone	490.1573351
Tile	412.0833333
Wood	40.88541667
Grand Total	**24930.21643**

These calculations provided are pivot tables from Raw Data (hyperlinked above in Data Collection) estimates for the total area of each type of step that needs to be painted or dyed based on the Blondel Formula and the provided data.

Adding the total square inches of steps to be painted, excluding the carpeted steps:

Total Area to be Painted/ Dyed ≈ 24,930 square feet

So, the total area that needs to be painted and dyed is approximately 24,930 square feet.

10. Estimation of Paint Cost:

As per the “Paint” table, that contains total number of gallons needed for individual paint types that includes the number of gallons needed per multiple coats as suggested by the steps table for different paint types, we get:

To calculate the cost for each type of paint, we'll multiply the quantity of paint needed (in gallons) by the price per gallon.

For Acrylic latex paint:
Cost = Quantity_of_paint * Price_per_Gallon
Cost = 144.70 gallons * $30.00/gallon
Cost = $4,341

For Oil-based paint:
Cost = Quantity_of_paint * Price_per_Gallon
Cost = 15.69 gallons * $40.00/gallon
Cost = $627.60

For Water-based paint:
Cost = Quantity_of_paint * Price_per_Gallon
Cost = 19.48 gallons * $30.00/gallon
Cost = $584.40

For Primer:
Cost = Quantity_of_paint * Price_per_Gallon
Cost = 62.32 gallons * $15.00/gallon
Cost = $934.8

Total cost of paint = ∑(Paint.Quantity_of_paint X Paint.Price_per_Gallon)
= $6,487.8 + error margin ~ $7,000/-

11. Estimation Labour Cost:

Contractor Costs:
The contractor charges for surveying the step count and gathering data by 10 workers at a rate of $15 per hour for each worker. They worked simultaneously for approximately 8 hours. Let's calculate the total cost for the contractor's services:

Number of Workers: 10
Hourly Rate per Worker: $15
Total Hours Worked per day: 8

Painter Costs:
The painter charges for painting the steps by 10 painters at a rate of $15 per hour for each painter.

Total steps: 2,671
Time to paint one step: 20 minutes (Assuming)
Total hours required for one painter:

2,671 x 1/3 = 890.33 hours ~ 891 hours

Total hours required for 10 painters working simultaneously:

891/10 ~ 89.1 hours + misc time ~ 100 hours (Assuming 14 hours of transition/transportation time and other misc time)

Total paint labor cost: 100 (Hours) x 10 (Number of Painters) x $30 (Hourly Rate) = $30,000.

Total labor costs: Painter Costs = $30,000.

Total Number of Days = 100 hours / 8 hours = 12.5 ~ 13 days of labor.

12. Estimated Cost of Equipment:

List of essential tools, including the tools needed for dying carpets, along with their quantities and market prices:

1. Measuring Tools:
  Tape Measure: 2 units (Price: $15 each)
  Laser Level: 10 unit (Price: $50 each)

2. Painting Tools:
  Paint brushes : 50 units (Price: $17 each)
  Paint Trays: 10 units (Price: $5 each)
  Drop Cloths: 100 units (Price: $2 each)
  Tape: 500 units (Price: $2 each)

4. Safety Equipment:
  Safety Glasses: 10 units (Price: $10 each)
  Work Gloves: 10 pairs (Price: $15 each)

5. Cleaning Tools:

Broom: 1 unit (Price: $15)
Dustpan: 1 unit (Price: $5)
Cleaning Rags: 10 units (Price: $2 each)

6. Miscellaneous Tools:
Utility Knife: 1 unit (Price: $10)
Paint Scraper: 1 unit (Price: $10)
Extension Cord: 2 units (Price: $15 each)

Total Cost Estimate:
Measuring Tools: $530
Painting Tools: $2100
Safety Equipment: $125
Cleaning Tools: $40
Miscellaneous Tools: $50

Grand Total (with Carpentry Tools): $2,845.

These estimates include the tools necessary for dying carpets along with the other essential tools, considering their respective quantities and prices.

13. Total Cost:

Total Cost Breakdown:

Grand Total Cost:
Total Paint Cost + Total Labour Cost + Total Equipment Cost
$7,000 + $30,000 + $2,845 = $39,845 ~ $40,000/-

So, the estimated total cost for the project, including paint, labor, and equipment, is approximately $40,000/- in 13 days post planning.

14. Conclusion:

This comprehensive report provides detailed insights into the steps painting project at the UT Tyler campus, covering cost analysis, procedural guidelines, and additional considerations for successful project execution. By analyzing step distribution, material types, paint requirements,

labor costs, and equipment needs, this report serves as a valuable resource for decision-making and planning purposes, ensuring the effective implementation of the campus beautification initiative.

15. Notes:

- Since step data collection is challenging due to restricted access; therefore, coordination with project managers, utilization of architectural drawings, or remote collaboration with construction teams is necessary.
- Painting with the color orange when dealing with an odd number of steps to maintain consistency and ensure a uniform pattern throughout the staircase.
- The data provided in this report is specific to the scope of this project. More accurate data will be gathered in future data collection efforts.

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