

Course	ENGR 13300	Semester	Fall 2024
Assignment Name	13300 HW 1	Section	22
Student 1 Name	Arjun Pathan	List collaborators if any(Name, Purdue login)	
Student 1 Purdue login	rajhar21		

←—replace the shaded text with actual values
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Problem Description

add a description and delete this comment!

Input Section:

Table 1: Spot Weld Shear Strength Tests

Weld Strength (MPa)
5400
5420
5407
5463
5421
5429
5469
5408
5475
5401
5416
5381
5442
5446
5377
5463
5376
5467
5464
5422
5388
5416
5376
5364
5409
5382
5409
5421
5422
5387
5409
5406
5416
5388
5405
5444
5435
5467
5429
5466
5399
5445
5381
5401
5458
5383
5391
5436
5425
5411
5465
5401
5477
5464
5388
5399
5431
5407
5447
5463
5388
5431
5416
5385
5329
5428
5372
5440
5431
5440
5472
5418
5481
5413
5390
5422
5423
5465
5387
5406
5399
5446
5441
5427
5440
5342
5435
5386
5412
5421
5462
5462
5387
5462
5384
5396
5406
5420
5462
5418

Calculation Section:

Table 2: Calculation of descriptive statistics for data in Table 1

statistic	value	unit
min	5329 MPa	
max	5467 MPa	
range	158 MPa	
mean	5421.7 MPa	
median	5421.5 MPa	
mode	5431 MPa	
standard deviation	33.5 MPa	
variance	1123.6 (MPa) ²	
count	100 count	

Table 3: Calculation of histogram quantities

description	value	unit
number of bins using general rule	10	
bin width using general rule	15.8	
5377		
Updated values to make the histogram more presentable.		
number of bins	10	
bin width	16	
bin upper limits	5345	
	5361	
	5377	
	5393	
	5409	
	5425	
	5441	
	5457	
	5473	
	5489	

Table 4: Calculations for minimum required shear strength

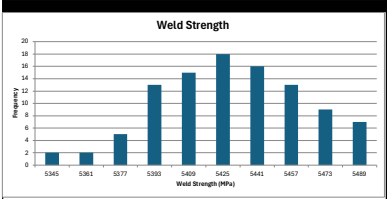
description	value	unit
1 ksi =	6.8948	(MPa)
https://www.engineeringtoolbox.com/unit-converter-d_186.html#stress		
required minimum shear strength	780	(ksi)
number of samples below the required minimum shear strength	91	

Output Section:

Table 5: Outputs of EXCEL Histogram Function (Analysis ToolPak)

Bin	Frequency
5345	2
5361	2
5377	5
5393	13
5409	15
5425	18
5441	16
5457	13
5473	9
5489	7
More	0

Figure 1: Histogram of weld shear strength tests



Question 5

If the required minimum shear strength is 780 ksi (kilo pound per square inch), should the company buy the welding robot? Justify your answer using the data.

Yes because 91% of the welds were above 780 ksi.