SUBJECTIVE IMAGE QUALITY ASSESSMENT OF IMPAIRED IMAGES: LOSSY COMPRESSION

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OUTLINE

- Target problem: subjective image quality assessment of compressed images after lossy compression
- System used: Google forms
- Experiment design
- Experiment analysis:
  -zoom problem
  -different orders
  -mos, variance
  -visual MOS table
- Conclusion

SEE HOW COMPRESSION AFFECTS QUALITY

- Subjective quality :

  5 (Excellent) – The impairment is imperceptible
  4 (Good) – The impairment is perceptible but not annoying
  3 (Fair) - The impairment is slightly annoying
  2 (Poor) - The impairment is annoying
  1 (Bad) - The impairment is very annoying

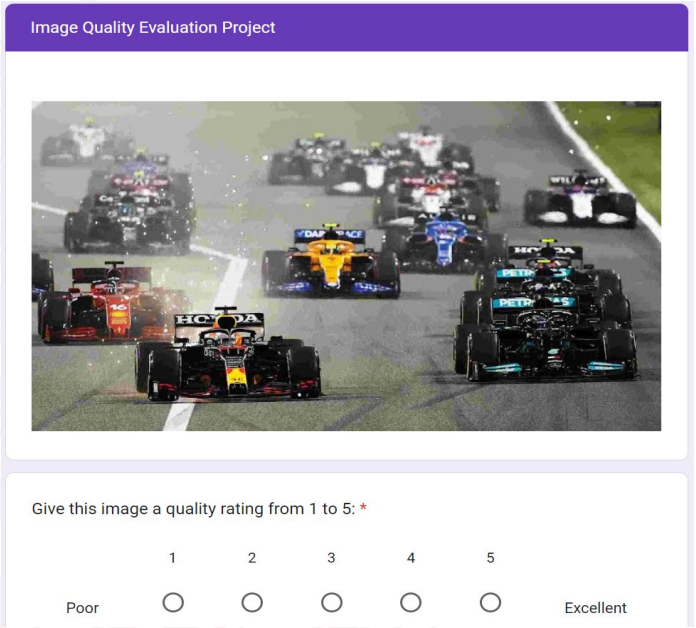
- See how compression affects quality

- **Google Forms**

  Ordering problem
  Different forms
  Automatic data in .csv file

- **Image Repository**

  Google Drive folder
  https://drive.google.com/drive/folders/1DqG0UIAlb1WdJA2gqZyLbNae3RLXM_7c?usp=share_link



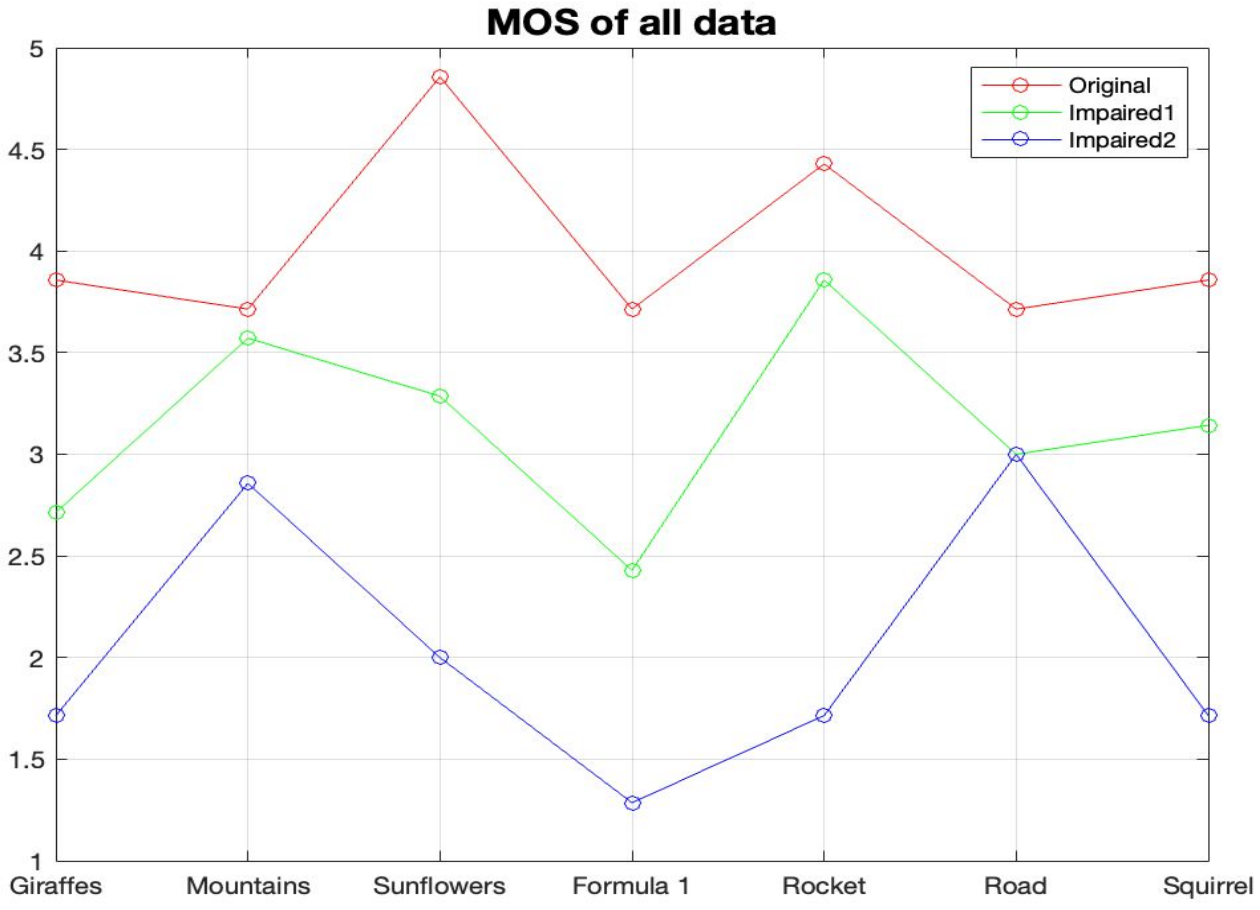


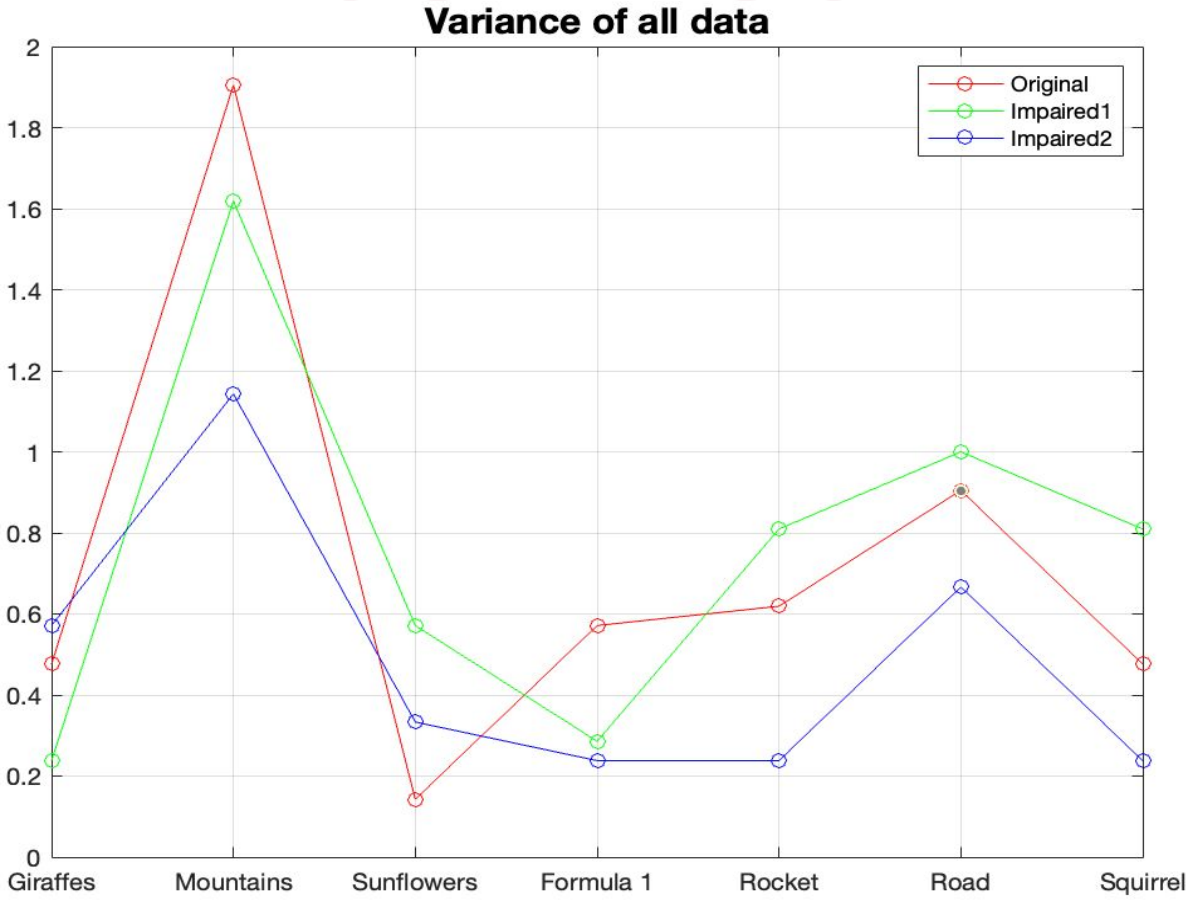



EXPERIMENT DESIGN

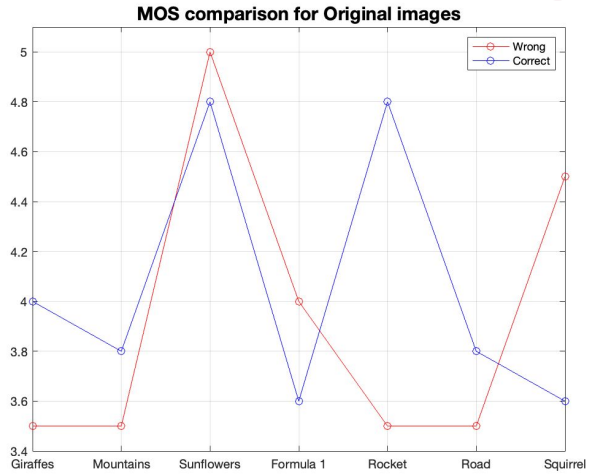
-jpeg compression
-same conditions for everyone
-can't change answers
-users considered as "experts"

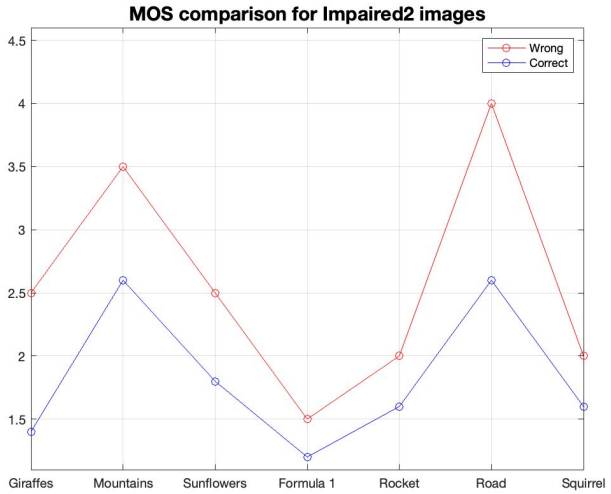
Screen distance	zoom level	screen dimension	
70 cm	150%(100)	24 inches	
image dimensions (ratio)		Total time limit	Time limit per image
>= 1600x900 (16:9)		3:30 minutes	15 seconds

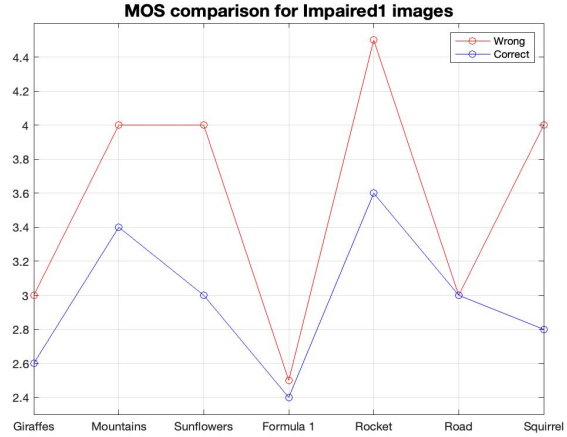

MOS of all data
Original
Impaired1
Impaired2
5
4.5
4
3.5
3
2.5
2
1.5
1
Giraffes
Mountains
Sunflowers
Formula 1
Rocket
Road
Squirrel

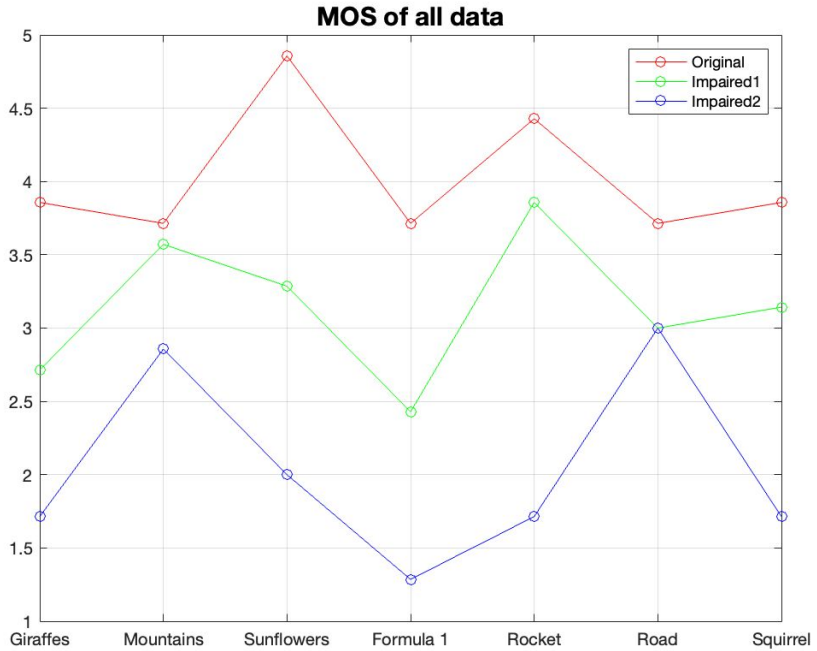

Variance of all data
Original
Impaired1
Impaired2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Giraffes
Mountains
Sunflowers
Formula 1
Rocket
Road
Squirrel

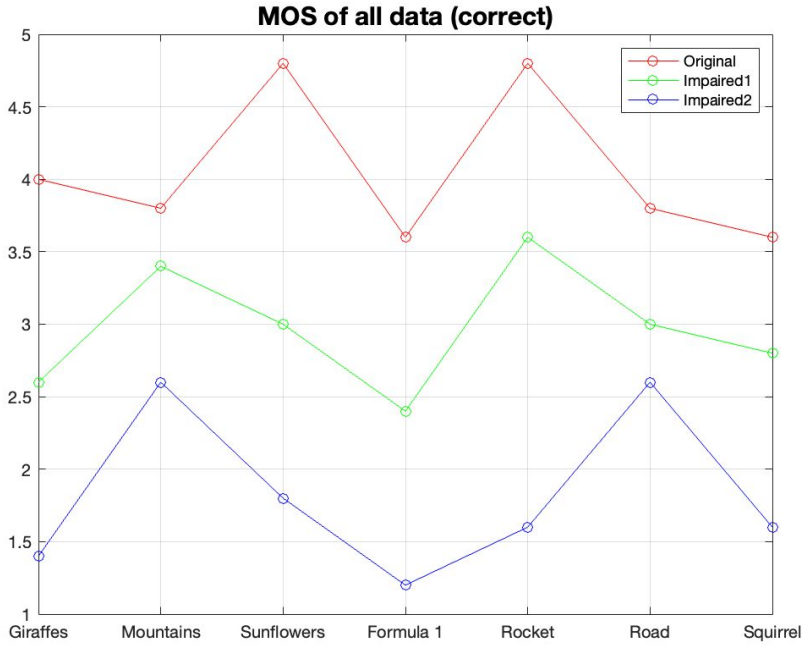
ZOOM PROBLEM



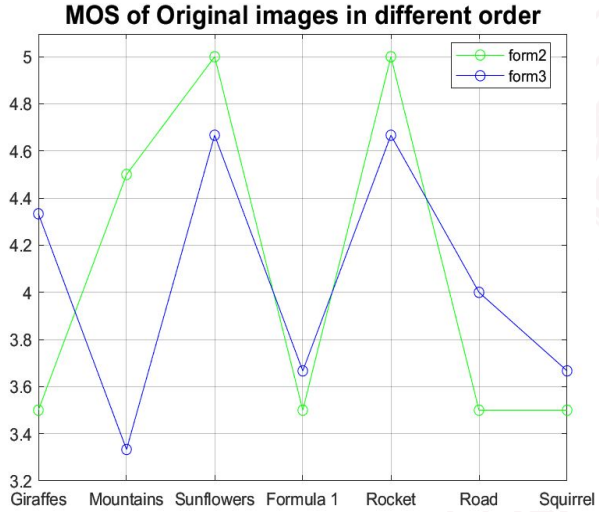


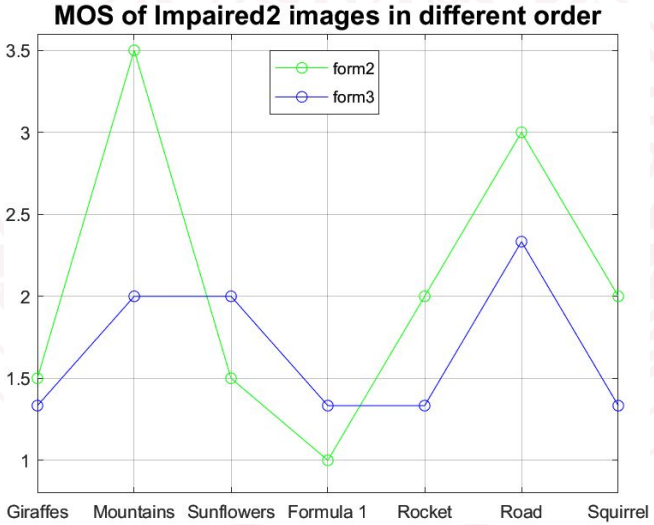


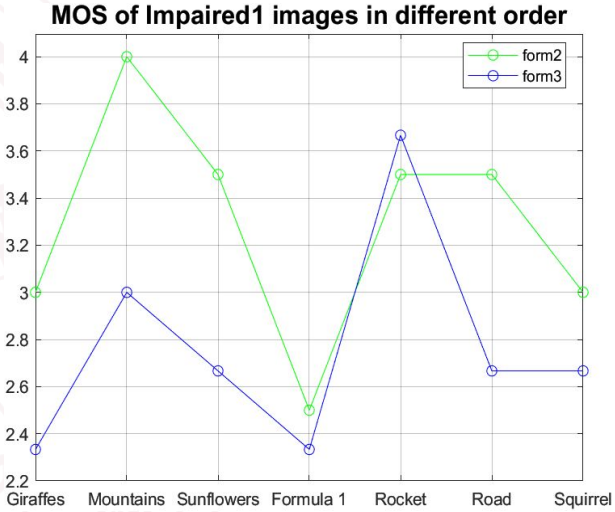

MOS of all data
Original
Impaired1
Impaired2
5
4.5
4
3.5
3
2.5
2
1.5
1
Giraffes
Mountains
Sunflowers
Formula 1
Rocket
Road
Squirrel


MOS of all data (correct)
Original
Impaired1
Impaired2
5
4.5
4
3.5
3
2.5
2
1.5
1
Giraffes
Mountains
Sunflowers
Formula 1
Rocket
Road
Squirrel

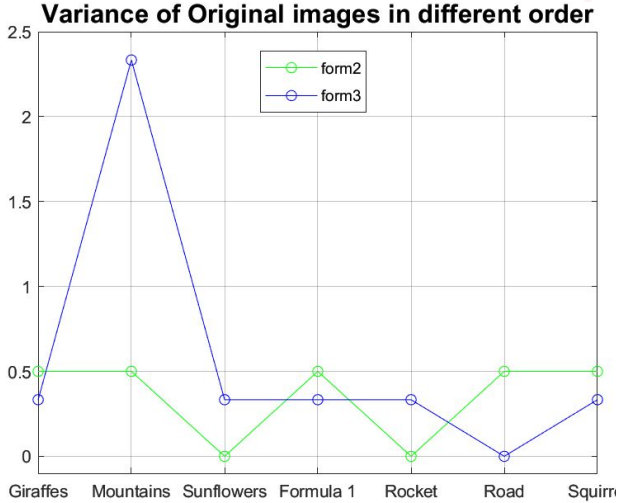
DIFFERENT ORDERS: MOS

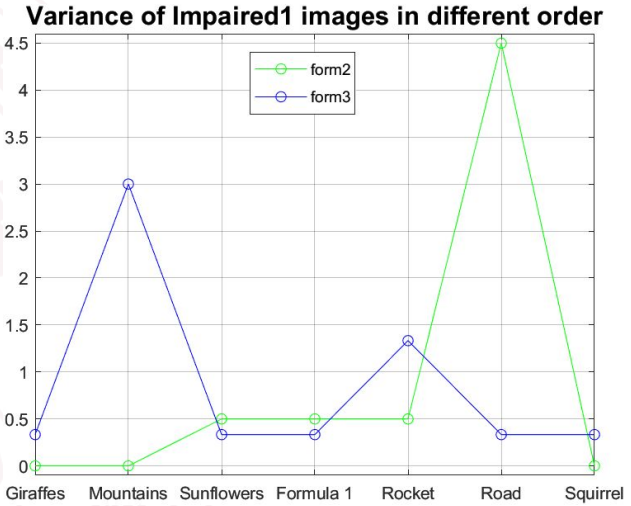


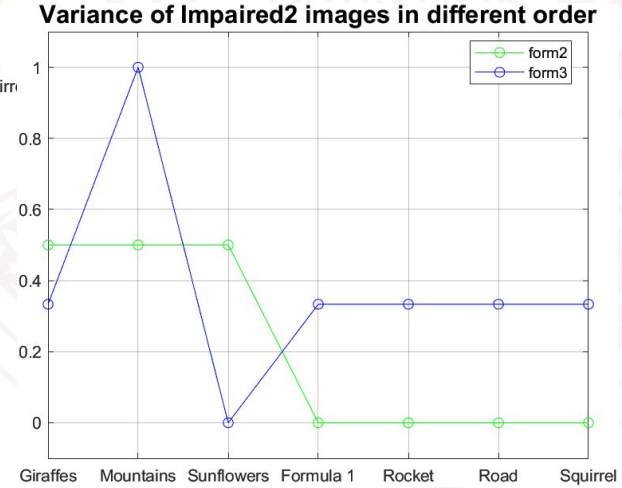




DIFFERENT ORDERS: VARIANCE







VISUAL MOS TABLE

	form	person	Unimpaired images							Slightly impaired images							Highly impaired images						
			Giraffe	Mountains	Sunflowers	Formula 1	Rocket	Road	Squirrel	Giraffe	Mountains	Sunflowers	Formula 1	Rocket	Road	Squirrel	Giraffe	Mountains	Sunflowers	Formula 1	Rocket	Road	Squirrel
Wider visual	2	3	3	4	5	3	5	3	3	3	4	4	3	3	2	3	1	4	2	1	2	3	2
	2	4	4	5	5	4	5	4	4	3	4	3	2	4	5	3	2	3	1	1	2	3	2
	3	5	4	2	4	4	4	4	3	2	2	3	2	3	3	2	1	1	2	1	2	2	1
	3	6	5	5	5	3	5	4	4	2	5	2	2	5	3	3	1	2	2	1	1	3	1
	3	7	4	3	5	4	5	4	4	3	2	3	3	3	2	3	2	3	2	2	1	2	2
	Mean		4,00	3,80	4,80	3,60	4,80	3,80	3,60	2,60	3,40	3,00	2,40	3,60	3,00	2,80	1,40	2,60	1,80	1,20	1,60	2,60	1,60
	Variance		0,50	1,70	0,20	0,30	0,20	0,20	0,30	0,30	1,80	0,50	0,30	0,80	1,50	0,20	0,30	1,30	0,20	0,20	0,30	0,30	0,30
Smaller visual	1	1	4	5	5	3	4	5	4	3	5	4	2	4	3	3	3	4	3	1	2	4	2
	1	2	3	2	5	5	3	2	5	3	3	4	3	5	3	5	2	3	2	2	2	4	2
	Mean		3,50	3,50	5,00	4,00	3,50	3,50	4,50	3,00	4,00	4,00	2,50	4,50	3,00	4,00	2,50	3,50	2,50	1,50	2,00	4,00	2,00
	Variance		0,50	4,50	0,00	2,00	0,50	4,50	0,50	0,00	2,00	0,00	0,50	0,50	0,00	2,00	0,50	0,50	0,50	0,50	0,00	0,00	0,00
Total mean			3,8571	3,7142	4,8571	3,7142	4,4285	3,7142	3,8571	2,7142	3,5714	3,2857	2,4285	3,8571	3,00	3,1428	1,7142	2,8571	2,00	1,29	1,71	3,00	1,71
Total variance			0,48	1,90	0,14	0,57	0,62	0,90	0,48	0,24	1,62	0,57	0,29	0,81	1,00	0,81	0,57	1,14	0,33	0,24	0,24	0,67	0,24

THANK YOU FOR YOUR ATTENTION