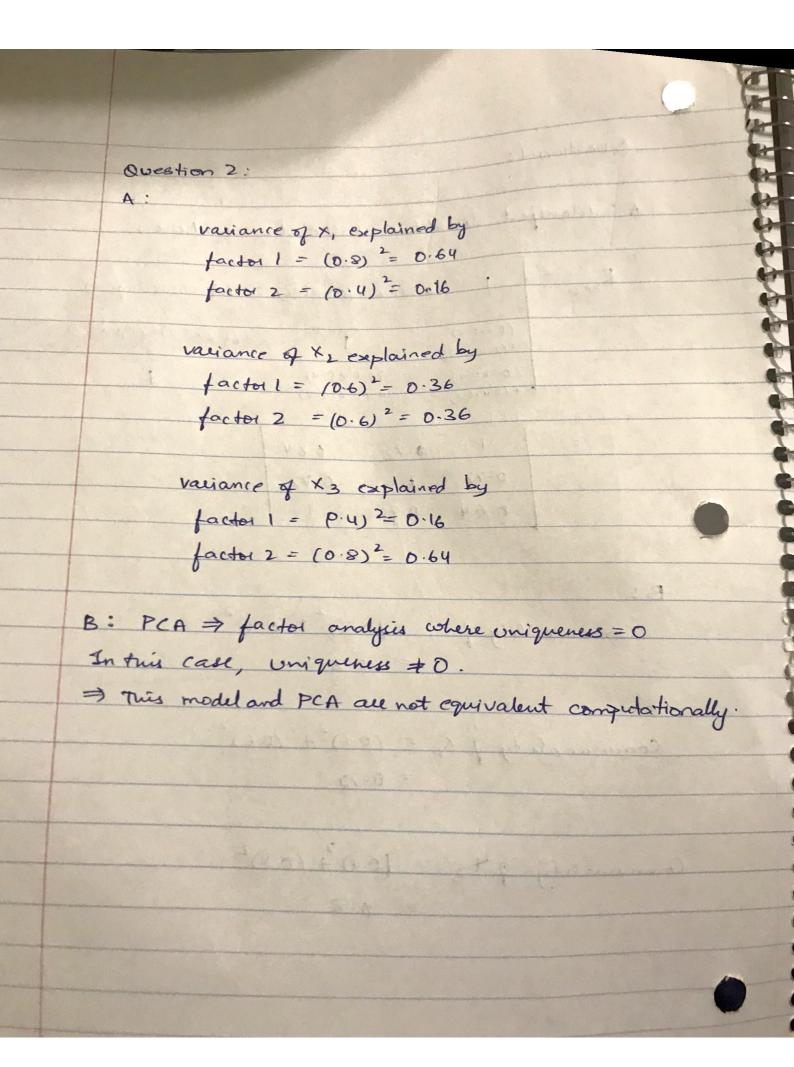
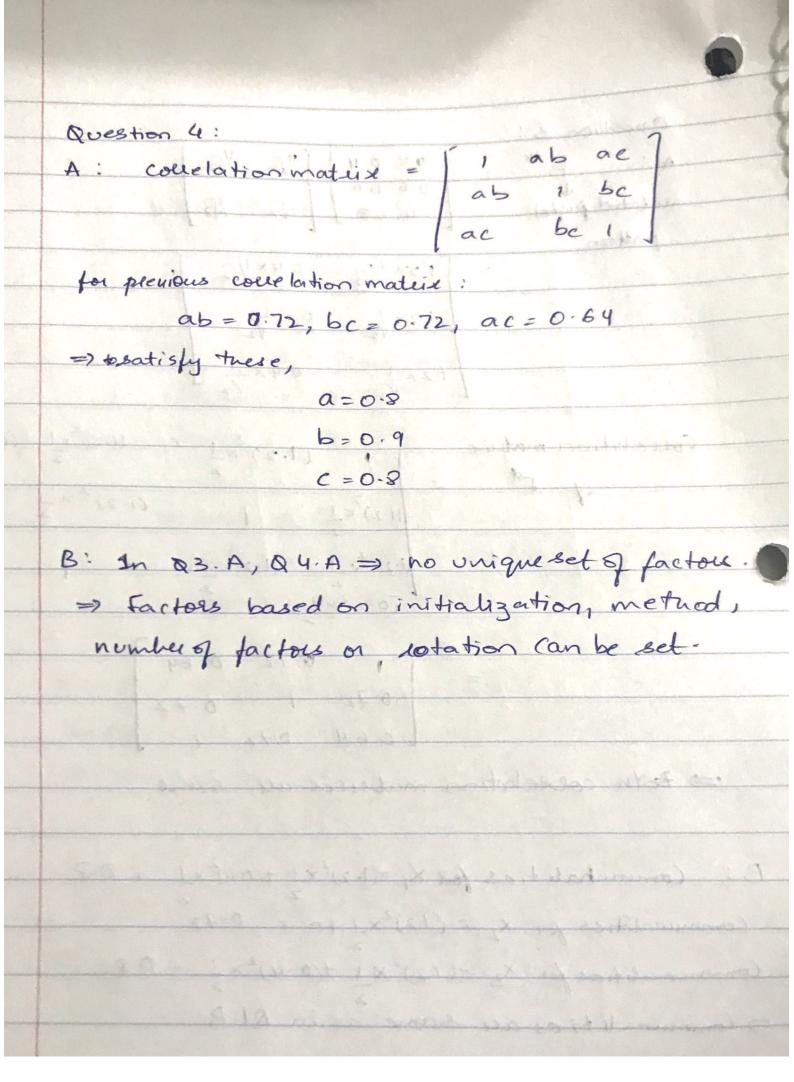
40 0 0 0 Question 1: 0 A: Manifest variables - Correlation matrix: 0 (7) (0.8×0.6)+(0.4×0.6) (0.8×0.4)+(0.4×0.8) (0.6x0.4)+(0.6x0.3) (0.8×0.8) +(0.4x0.8) (0.6 x 0.4) (D. 3x 0.0) + (0.6x0.8) + (0.4 x0.8) 6-64 8-72 0-72 0-72 0.64 0.72 Communality of X, = 10.8) 2+(0.4)2 B: 0 += 11 0.8 (mm) HE Communality of x2 = (0.6)2+ (0.6) = 0.72 Communality & +3 = (0.4) + (0-8)2



Question 3: = [0.4 0.8] [1/2 1/2] 0.4 0.6 [1/2 -1/2] A: F* rotated factor patten 1.2x 1/2 0.4x 1/2 1.2×1 0×12 ac = 0.64 Coccelation matrix $(1.2)^{2} \times \frac{1}{2}$ $(1.2)^{2} \times \frac{1}{2}$ $(1.2)^{2} \times \frac{1}{2}$ $(1.2)^{2} \times \frac{1}{2}$ $(1.2)^{2} \times \frac{1}{2}$ button portaglation To. W2 2 Land stated 2 0.72 0.64 0.72 1 0.72 0.64 0.72 1 => Both collelation materices all same B: Communalities for X, =(1.2) x 1 +(0.4) x 1 = 0.8 Communalities for X2 = (1-2)2x1+0 = 0.72 Communalities for x3 = (1-2)2x1 +(0.4)2x1 = 0.8 > Communalities are same as in QI.B >> Uniqueness of manifest variables > same before and after rotation > communalities all same.



Question 5:

A:

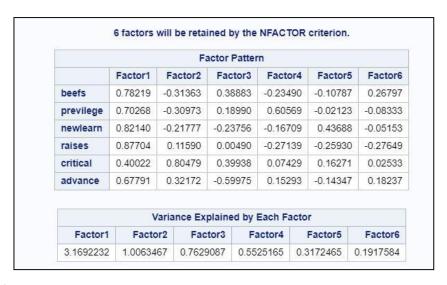
PROC FACTOR DATA=work.evaluate_supervisors METHOD=principal PRIORS=one MINEIGEN=0 NFACTORS=6;

VAR beefs previlege newlearn raises critical advance;

TITLE "PC style factor analysis Factor Analysis - 6 factors";

RUN;

B:



First two factors to be retained as they have eigen value greater than 1

C:

The first factor:

gives factors which contribute towards good attributes of a supervisor. A person who handles incoming complaints reasonably, identifies and gives a hand to merit, encourages learning and growth in the career. Thought inspite of it, this supervisor prefers a few over others.

The second factor:

gives the non good characteristic of an supervisor. Cynicism, no learning encouragement and no heed to complaints.

Question 6:

7 regression models were run.

First 6 models is on each factor on overall rating column

Seventh model uses all six factors

Model1: Overall ~ Factor1 R2 = 0.457

Model2: Overall ~ Factor2 R2 = 0.0788

Model3: Overall ~ Factor3 R2 = 0.0878

Model4: Overall ~ Factor4 R2 = 0.089

Model5: Overall ~ Factor5 **R2 = 0.006**

Model6: Overall ~ Factor6 R2 = 0.0139

Model7: Overall ~ Factor7 R2 = 0.73

Question 7:

A:

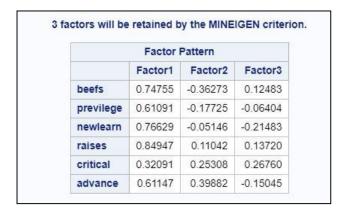
PROC FACTOR DATA=work.evaluate_supervisors METHOD=principal PRIORS=SMC NFACTORS=6 OUT=q7_factors;

VAR beefs previlege newlearn raises critical advance;

TITLE "Rsquare style factor analysis Factor Analysis - 6 factors";

RUN;

B:



The first factor:

gives factors which contribute towards good attributes of a supervisor. A person who

handles incoming complaints reasonably,

identifies and gives a hand to merit,

encourages learning and growth in the career.

Thought inspite of it, this supervisor prefers a few over others.

Second factor:

Gives factors of supervisor who is:

critical and

helps in advancement in employees' career

doesn't solve well the employees' complaints (low beefs score)

C:

In Q5,

Assumptions are made such that:

the uniqueness of each manifest variable is zero

factors explain all the variance.

Implies this results and PCA results are same

In Q5,

Assumptions are made such that:

the uniqueness of each manifest variable is non zero

For initial values, each variable is regressed on other variables for R2. These will be initial values.

Question 8:

A:

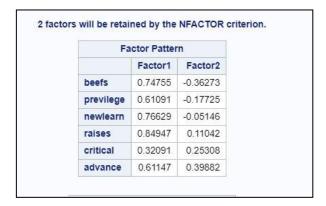
PROC FACTOR DATA=work.evaluate_supervisors METHOD=principal PRIORS=SMC NFACTORS=2 ROTATE=varimax OUT=work.evaluatesupervisors_scores;

VAR beefs previlege newlearn raises critical advance;

TITLE "Rsquare style factor analysis Factor Analysis - 2 factors";

RUN;

B:



Yes, the first two factors for this question are not the same as the first 2 factors for the previous question

C:

The VARIMAX factor rotation matrix is:

R	otation Method:	varimax
Orthog	gonal Transform	ation Matrix
	1	2
1	0.79912	0.60117
2	-0.60117	0.79912

Orthonormality: Matrix is orthonormal

VARIMAX rotation	WA 64	VARIMA: rotation	22.60	Product matr	
0.79912	0.60117	0.79912	-0.60117	0.999998	0
-0.60117	0.79912	0.60117	0.79912	0	0.999998

Rotated Factor Pattern				
	Factor1	Factor2		
beefs	0.81544	0.15954		
previlege	0.59475	0.22561		
newlearn	0.64329	0.41955		
raises	0.61245	0.59891		
critical	0.10431	0.39516		
advance	0.24889	0.68630		

The first factor:

gives factors which contribute towards attributes of a supervisor. A person who

handles incoming complaints reasonably,

identifies and gives a hand to merit,

encourages learning and growth in career.

Thought inspite of it, this supervisor prefers a few over others.

Second factor:

Gives factors of supervisor who is:

Needs to recognize merit

Encourage learnings

Help employees advance in roles

Question 9:

A:

			Simple St	atistics		
Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Factor1	30	0	0.85285	0	-1.86118	1.36525
Factor2	30	0	0.77645	0	-1.31002	2.01667
	Pe		orrelation (o > r unde		ents, N = 30 ho=0	
	Pe		> r unde			
			> r unde	r H0: R	ho=0	

We can see that the factors have standard deviations that are not one. Generally speaking, factors are to be standardized with zero mean and unit standard deviation. Here, correlations are not one either.

B:

	beefs	previlege	newlearn	raises	critical	adva
Actual Values	51.0	30.0	39.0	61.0	92.0	4
Mean	66.6	53.1	56.4	64.6	74.8	4
Standard Deviation	13.3	12.2	11.7	10.4	9.9	1
Standardized values	-1.2	-1.9	-1.5	-0.3	1.7	
Rotated Factor Pattern (Factor 1)	0.6	0.2	0.2	0.1	-0.1	
Rotated Factor Pattern (Factor 2)	-0.3	0.0	0.1	0.5	0.2	j
Factor Scores (Factor 1)	-1.463					
Factor Scores (Factor 2)	0.456					

Question 10:

PROC FACTOR DATA=WORK.evaluate_supervisors METHOD=ML PRIORS=smc ULTRAHEYWOOD;

VAR BEEFS--ADVANCE;

TITLE 'Maximum likelihood factors with SMC for communality, 6 factors, VARIMAX rotation -- Evaluation Data';

RUN;

A:

Significance Tests Based on 30 Observations				
Test	DF	Chi-Square	Pr > ChiSq	
H0: No common factors	15	65.5127	<.0001	
HA: At least one common factor				
H0: 2 Factors are sufficient	4	2.8155	0.5892	
HA: More factors are needed				

Null Hypothesis:

No common factors,

p-value < 0.05, implying rejection of the null hypothesis.

This shows that common factors exist.

B:

Null Hypothesis:

Two factors that are sufficient,

p-value > 0.05, implying no rejection of the null hypothesis.

This shows that extracted factors that are default in number are enough