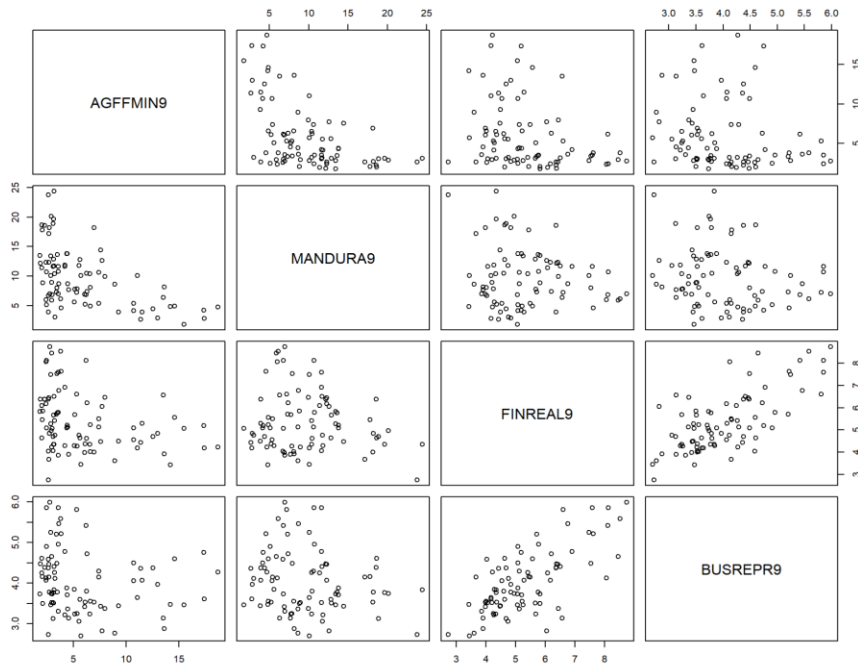


## Assignment 1

### 1. Scatterplot Matrix



2.

### Pearson Correlation Matrix

	AGFFMIN9	MANDURA9	FINREAL9	BUSREPR9
AGFFMIN9	1.00	-0.52	-0.29	-0.18
MANDURA9	-0.52	1.00	-0.14	-0.19
FINREAL9	-0.29	-0.14	1.00	0.70
BUSREPR9	-0.18	-0.19	0.70	1.00

& p-values

	AGFFMIN9	MANDURA9	FINREAL9	BUSREPR9
AGFFMIN9	0.00	0.00	0.03	0.25
MANDURA9	0.00	0.00	0.25	0.25
FINREAL9	0.01	0.19	0.00	0.00
BUSREPR9	0.10	0.08	0.00	0.00

### 3. Interpret the three relationships

#### AGFFMIN9 & MANDURA9

- Correlation:  $-0.52$
- Meaning: moderate negative relationship
- When AGFFMIN9 goes up, MANDURA9 usually goes down. They move in opposite directions.

#### MANDURA9 & FINREAL9

- Correlation:  $-0.14$
- Meaning: very weak relationship
- The numbers barely move together. The relationship is so small that it almost doesn't matter.

#### FINREAL9 & BUSREPR9

- Correlation:  $0.70$
- Meaning: strong positive relationship
- When FINREAL9 goes up, BUSREPR9 also goes up. These two move together very strongly.

### 4. Significance at $\alpha = 0.01$

#### AGFFMIN9 & MANDURA9

- p-value:  $0.00$
- significant. The relationship is real.

#### MANDURA9 & FINREAL9

- p-value:  $0.25$
- not significant. This weak relationship is probably just random.

#### FINREAL9 & BUSREPR9

- p-value:  $0.00$
- significant. Their strong positive relationship is real.

## 5. Weakest and strongest linear relationships

Strongest: FINREAL9 & BUSREPR9 ( $r = 0.70$ )

Weakest: MANDURA9 & FINREAL9 ( $r = -0.14$ )

## Assignment 2

### 1. Spearman Correlation Matrix

	AGFFMIN9	MANDURA9	FINREAL9	BUSREPR9
AGFFMIN9	1.00	-0.51	-0.31	-0.26
MANDURA9	-0.51	1.00	-0.02	-0.18
FINREAL9	-0.31	-0.02	1.00	0.62
BUSREPR9	-0.26	-0.18	0.62	1.00

p-values

	AGFFMIN9	MANDURA9	FINREAL9	BUSREPR9
AGFFMIN9	0.00	0.00	0.01	0.05
MANDURA9	0.00	0.00	0.85	0.21
FINREAL9	0.00	0.85	0.00	0.00
BUSREPR9	0.02	0.11	0.00	0.00

### 2. Strongest & weakest monotonic relationships + decisions

Strongest monotonic relationship: FINREAL9 & BUSREPR9 ( $\rho = 0.62$ )  $p = 0.00$  significant

Weakest monotonic relationship: MANDURA9 & FINREAL9 ( $\rho = -0.02$ )  $p = 0.85$  not significant

### 3. Compare Pearson vs Spearman

Both Pearson and Spearman show:

- AGFFMIN9 & MANDURA9 = moderate negative
- FINREAL9 & BUSREPR9 = strongest positive relationship
- Pearson shows MANDURA9 & FINREAL9 as a tiny negative linear relationship ( $-0.14$ )
- Spearman shows it as basically no relationship ( $-0.02$ )
- This means the ranked/monotonic pattern is even weaker than the linear pattern.

