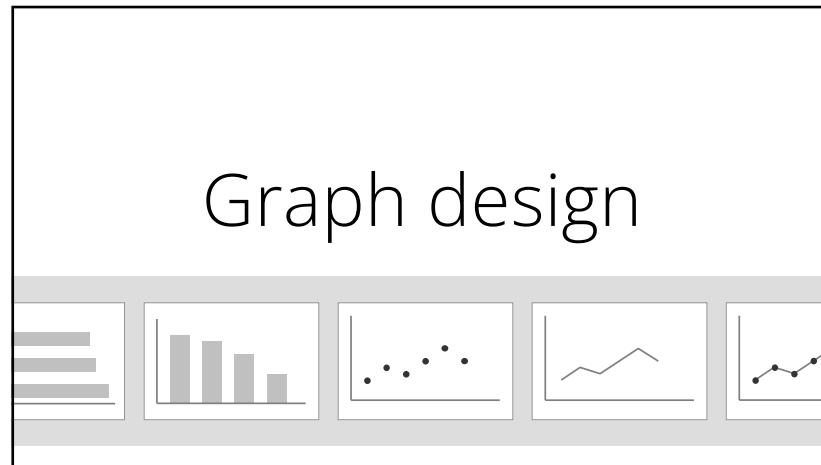
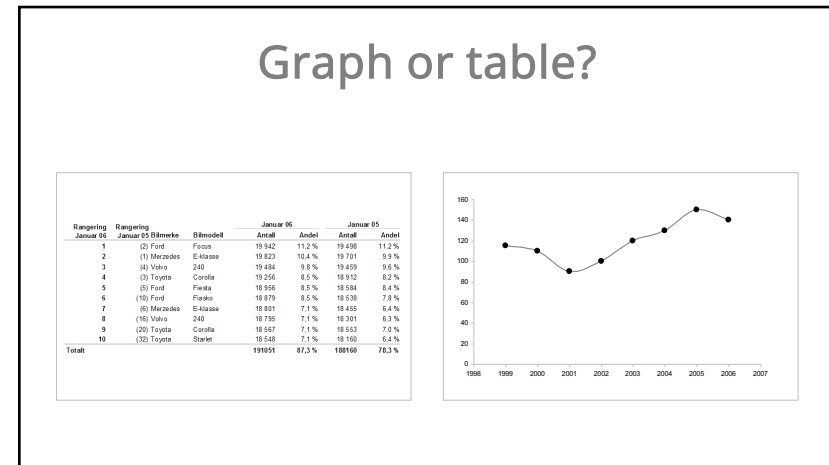
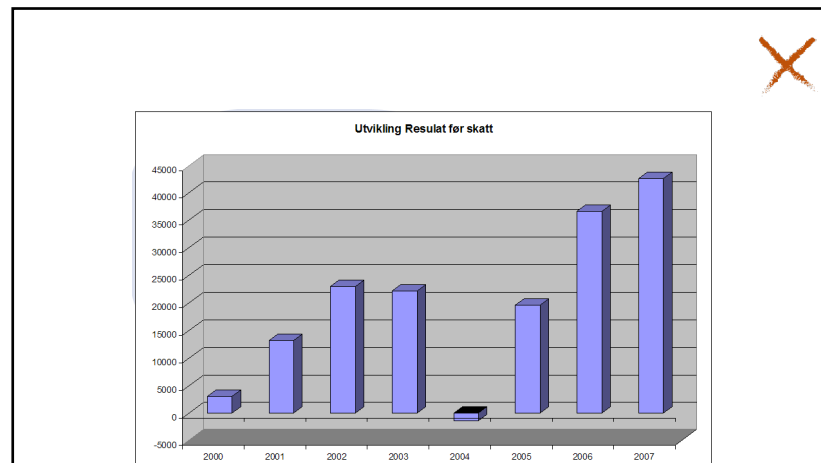




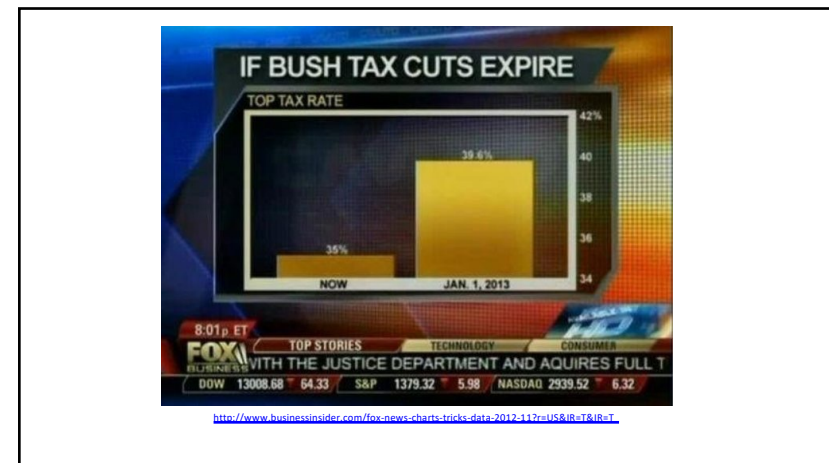
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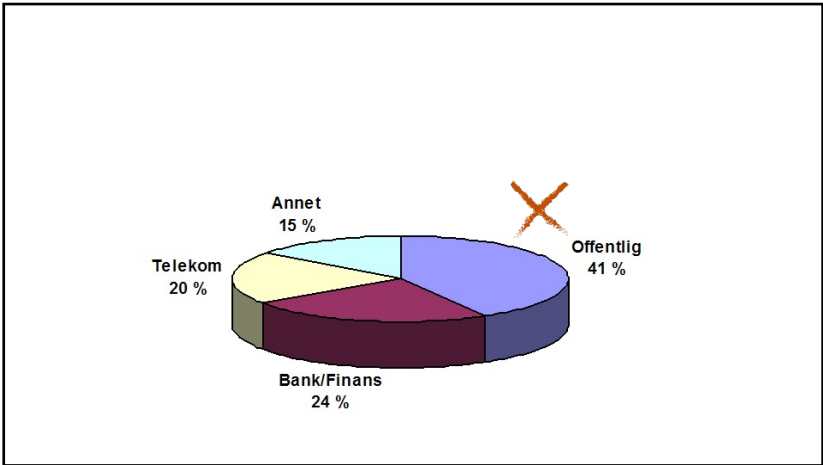
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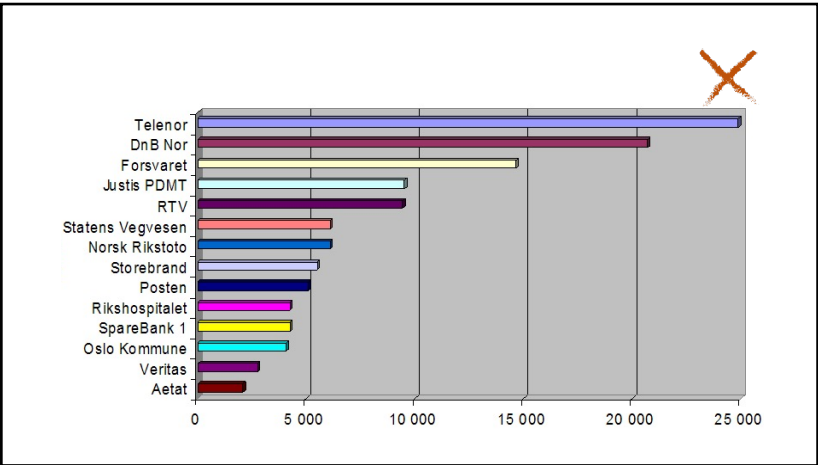
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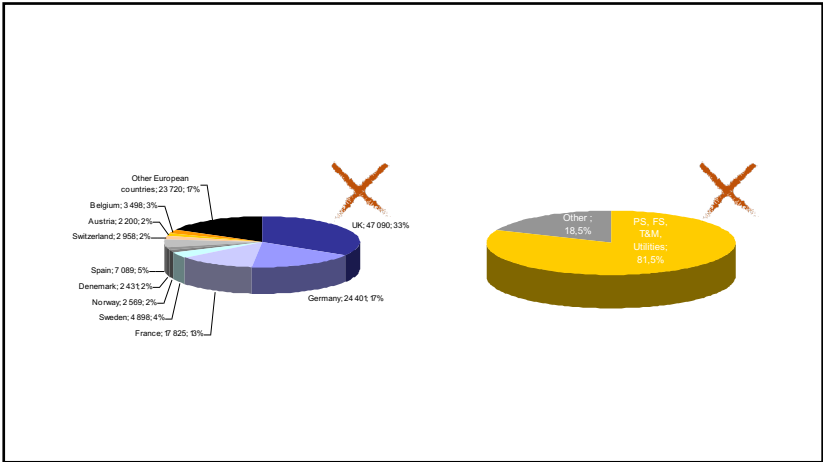
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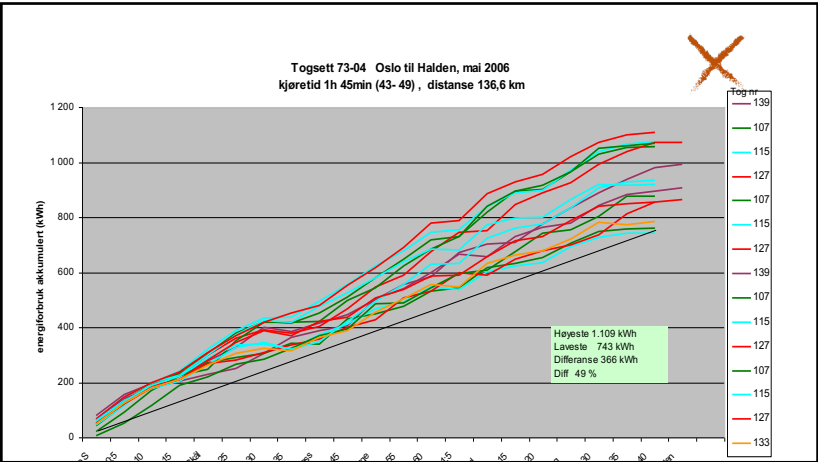
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6

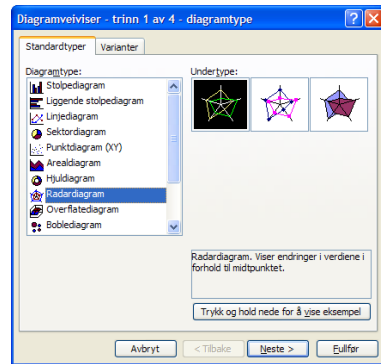


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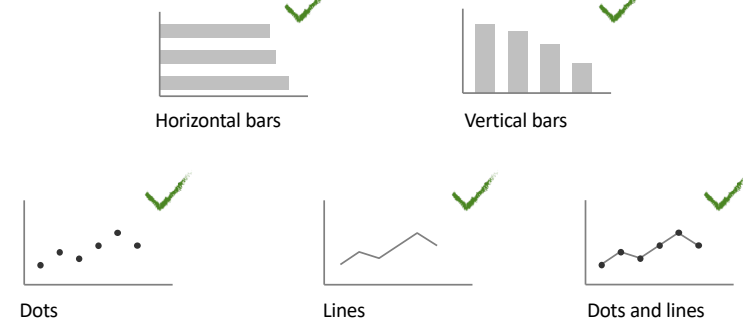
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The problem



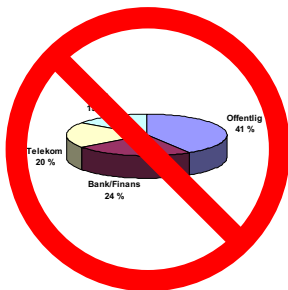
9

Five safe graph types



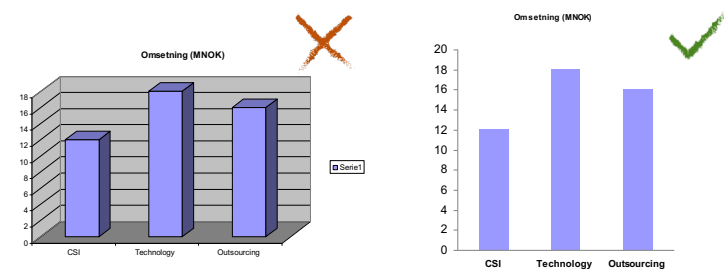
10

Avoid 3D-graphs



11

Data-ink ratio



12

Data-ink ratio

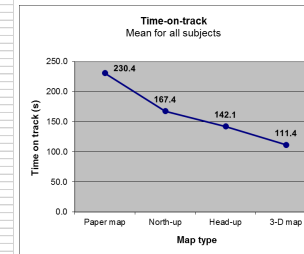
$$\text{Data-ink ratio} = \frac{\text{Data-ink}}{\text{Total ink used to print the graphic}}$$

= proportion of a graphic's ink devoted to the non-redundant display of data-information

= 1.0 - proportion of a graphic that can be erased

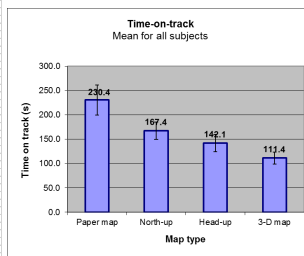
13

Paper map	North-up	Head-up	3-D map
272	323	125	111
276	172	138	98
232	132	118	108
115	132	88	84
347	377	408	230
194	170	151	127
80	73	63	52
134	139	151	138
132	147	124	126
159	137	157	119
423	196	153	120
425	246	151	140
139	134	95	86
288	239	157	154
286	288	180	208
540	208	175	148
262	187	185	123
333	179	169	131
182	146	133	101
139	124	98	88
103	85	96	77
189	208	84	72
219	304	116	83
208	226	214	154
153	185	127	82
141	150	128	76
284	180	92	76
132	142	101	89
258	135	142	93
77	78	67	55
217	137	123	109
157	188	117	106
555	186	203	158
134	146	95	86
251	195	249	144
187	210	159	152
212	192	223	201
182	118	114	85
134	136	95	86
157	145	145	78
159	159	95	81
158	124	75	65
259	150	153	105



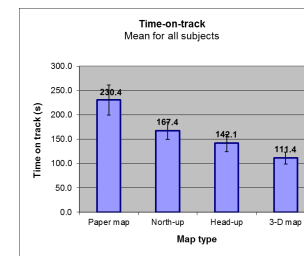
14

Paper map	North-up	Head-up	3-D map
272	323	125	111
276	172	138	98
232	132	118	108
115	132	88	84
347	377	408	230
194	170	151	127
80	73	63	52
134	139	151	138
132	147	124	126
159	137	157	119
423	196	153	120
425	246	151	140
139	134	95	86
288	239	157	154
286	288	180	208
540	208	175	148
262	187	185	123
333	179	169	131
182	146	133	101
139	124	98	88
103	85	96	77
189	208	84	72
219	304	116	83
208	226	214	154
153	185	127	82
141	150	128	76
284	180	92	76
132	142	101	89
258	135	142	93
77	78	67	55
217	137	123	109
157	188	117	106
555	186	203	158
134	146	95	86
251	195	249	144
187	210	159	152
212	192	223	201
182	118	114	85
134	136	95	86
157	145	145	78
159	159	95	81
158	124	75	65
259	150	153	105

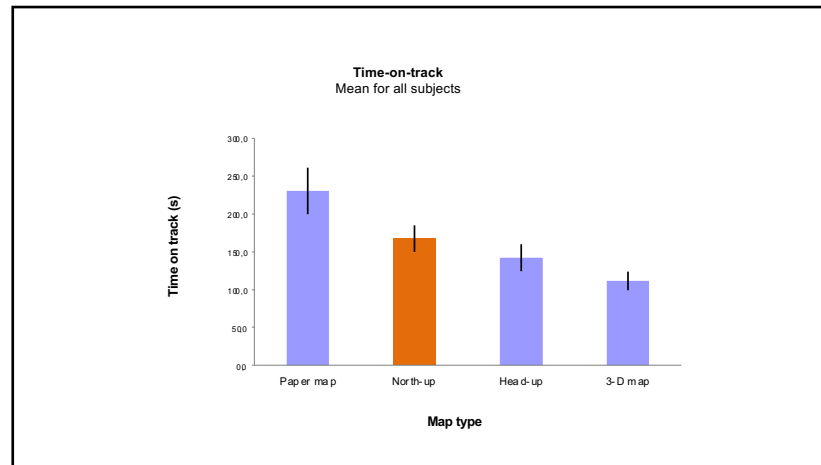


$$\frac{\text{Data}}{\text{Ink}} = \text{Ratio}$$

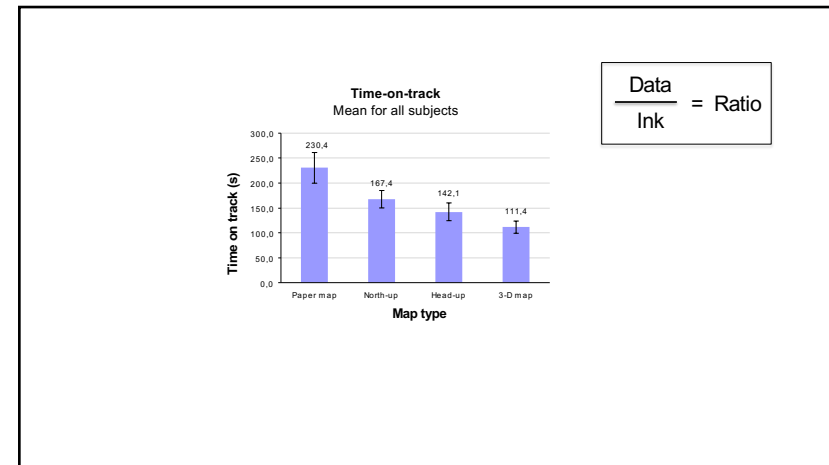
15



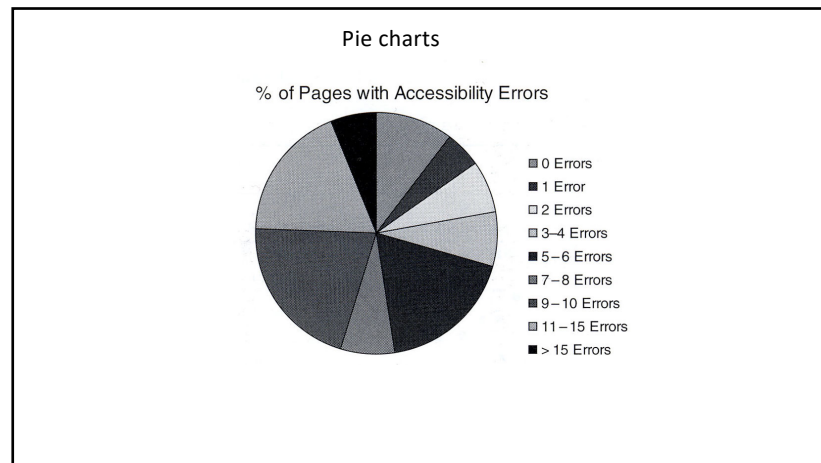
16



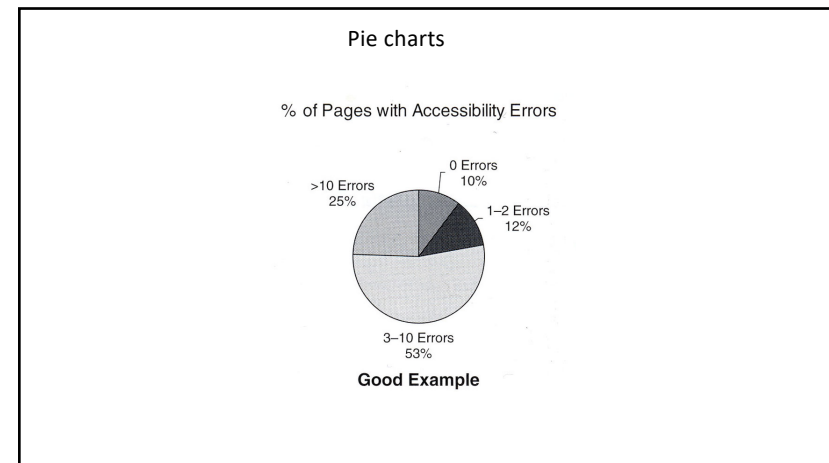
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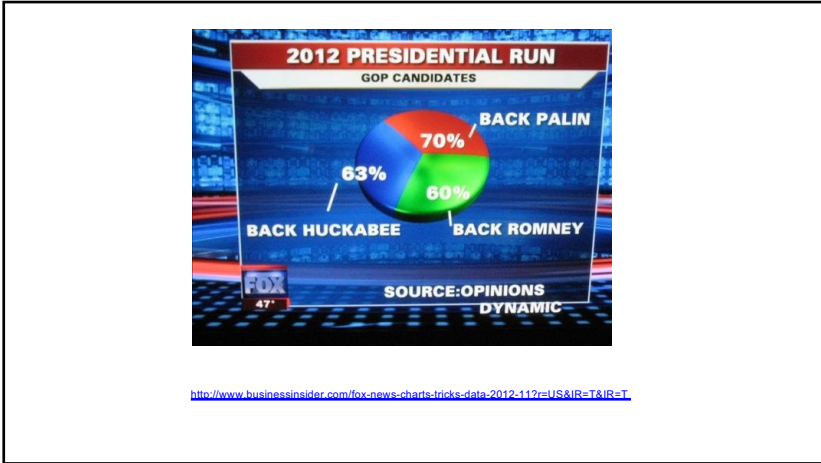
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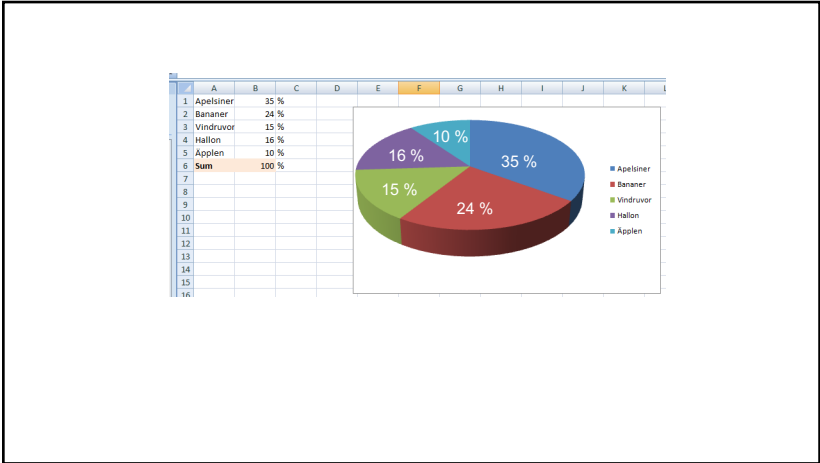
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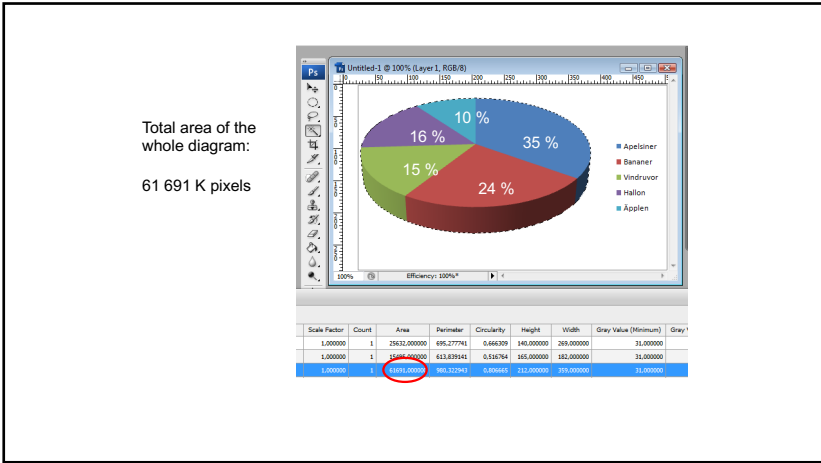
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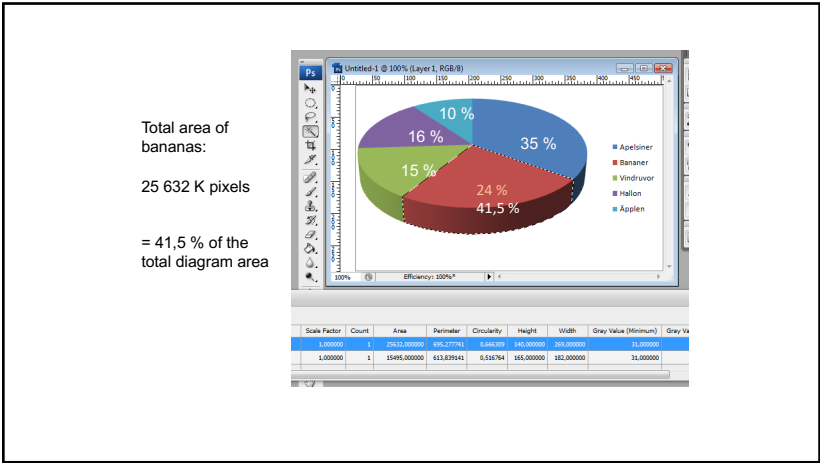
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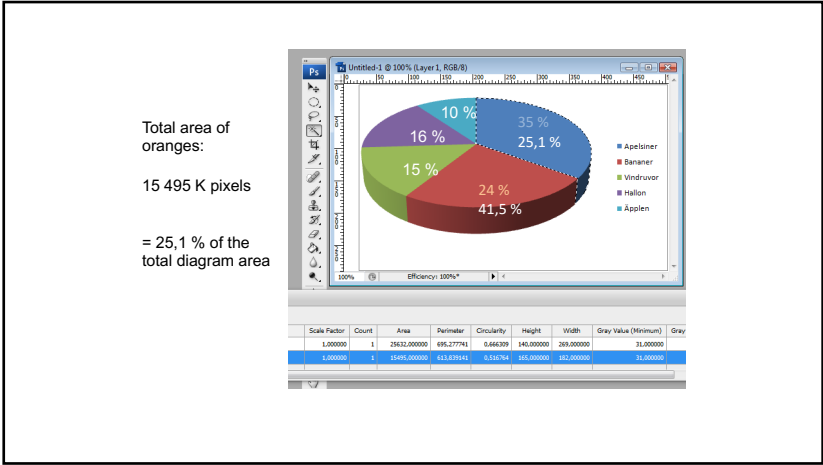
22



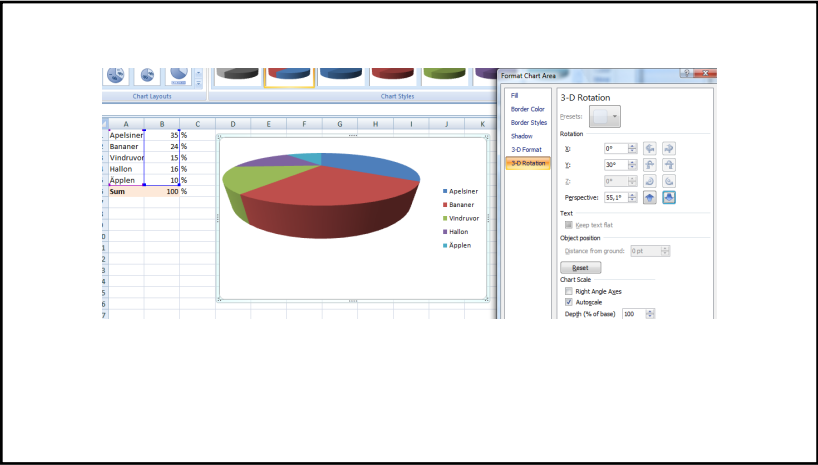
23



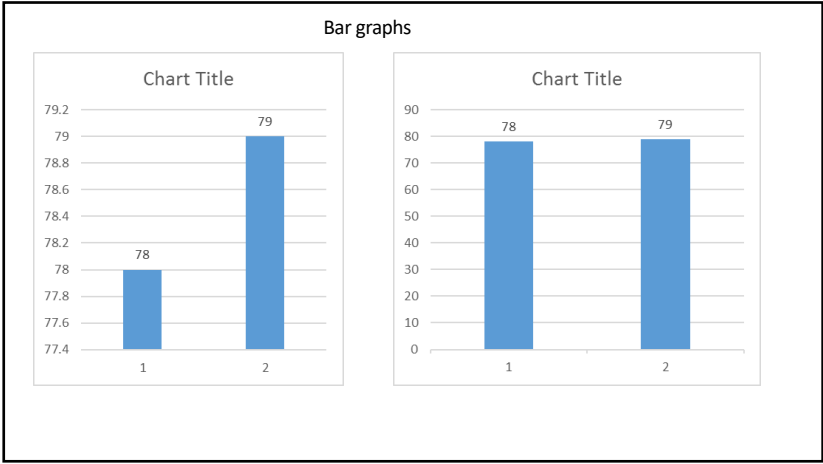
24



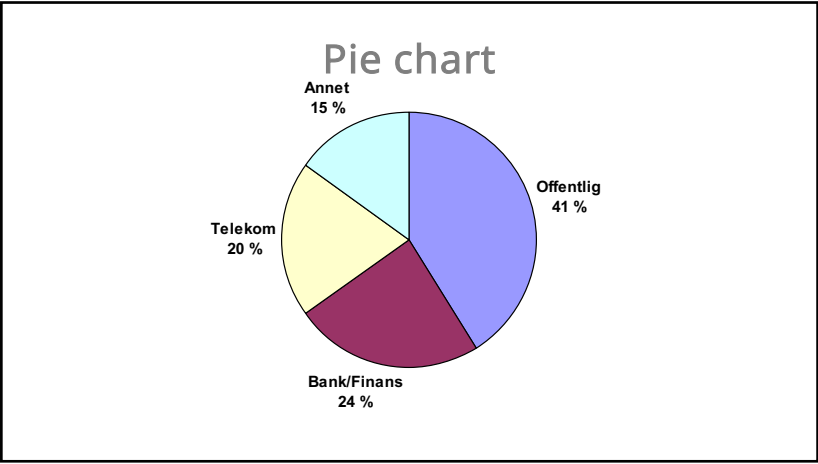
25



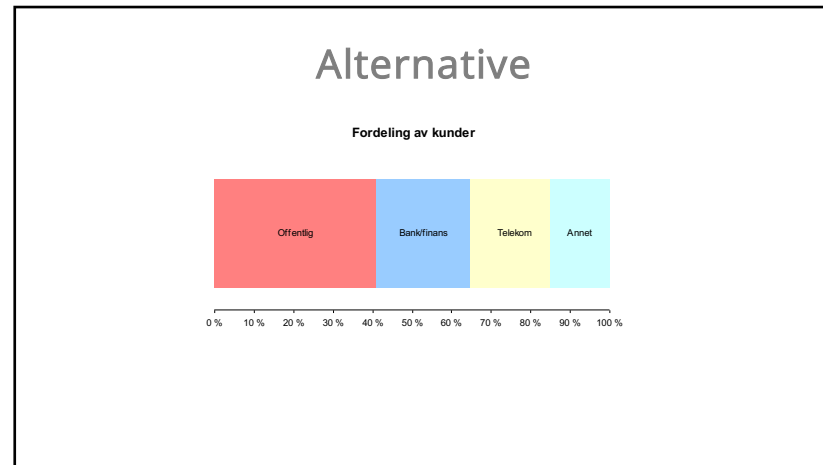
26



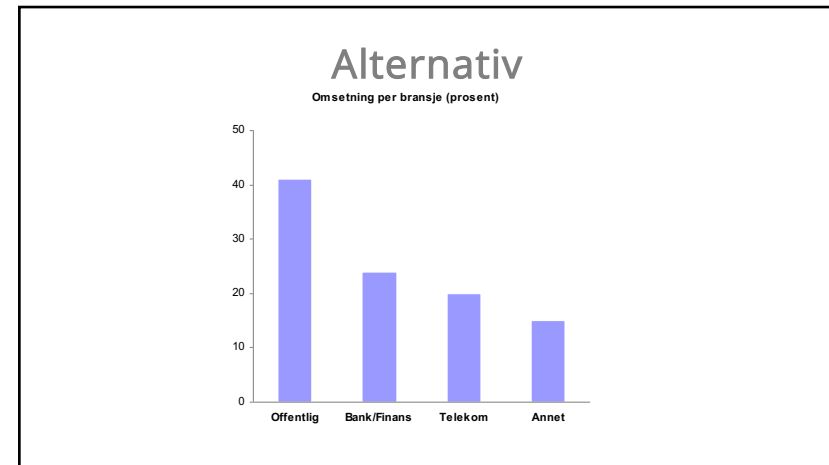
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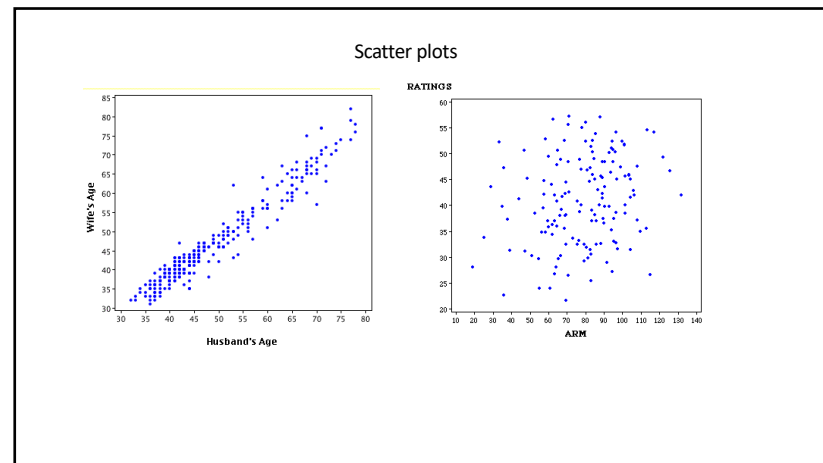
28



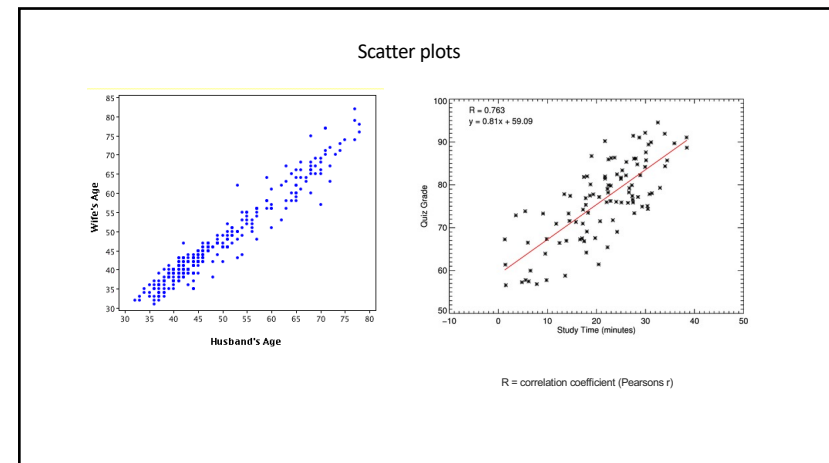
29



30



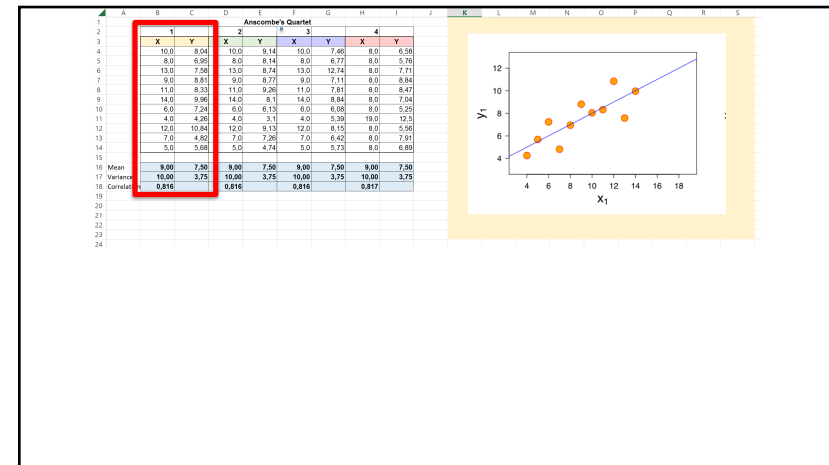
31



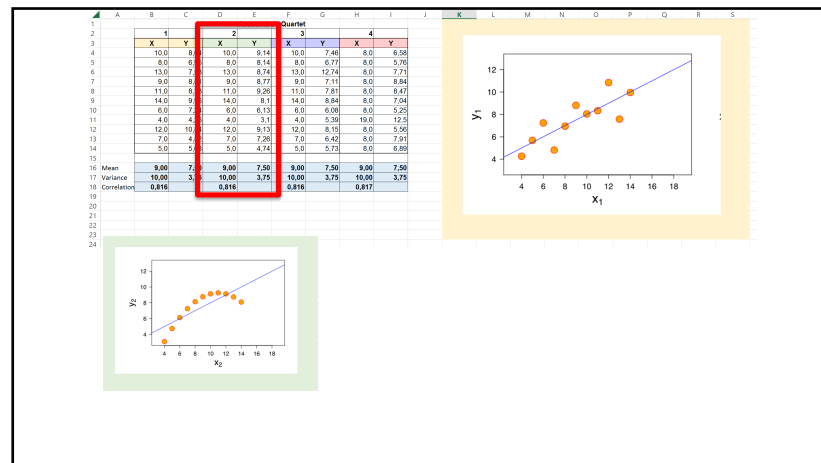
32

Anscombe's Quartet									
	1	2	3	4					
X	Y	X	Y	X	Y	X	Y		
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58		
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76		
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71		
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84		
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47		
14.0	9.96	14.0	8.1	14.0	8.84	8.0	7.04		
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25		
4.0	4.26	4.0	3.1	4.0	5.39	19.0	12.5		
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56		
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91		
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89		
Mean	9.00	7.50	9.00	7.50	9.00	7.50	9.00	7.50	
Variance	10.00	3.75	10.00	3.75	10.00	3.75	10.00	3.75	
Correlation	0.816		0.816		0.816		0.817		

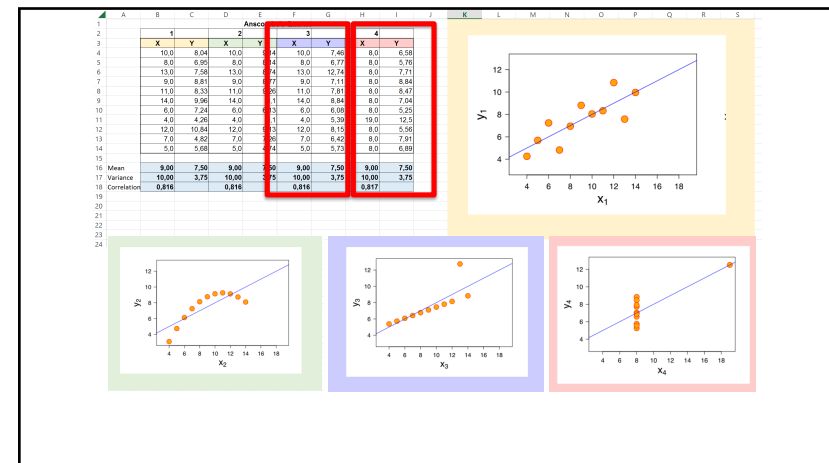
33



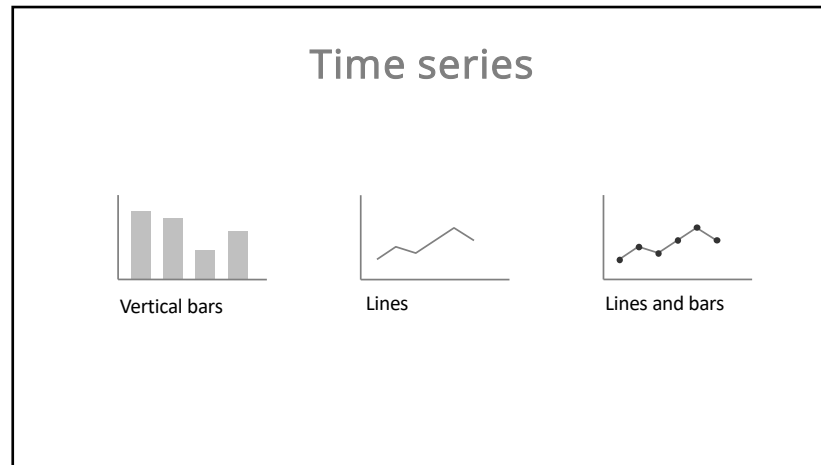
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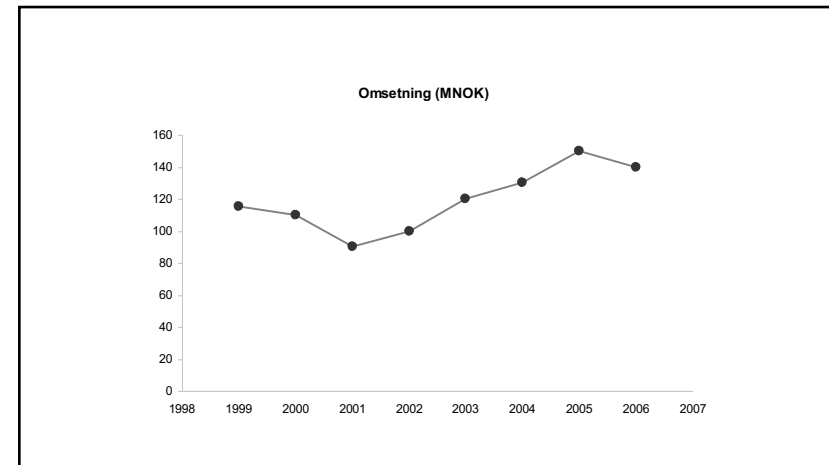
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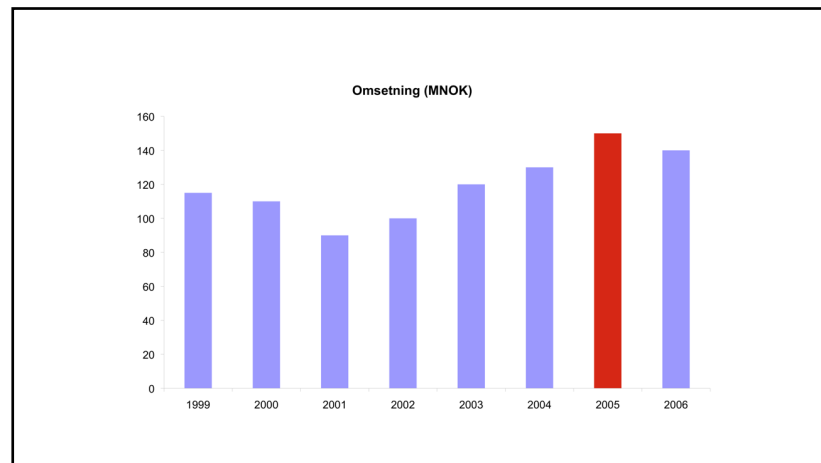
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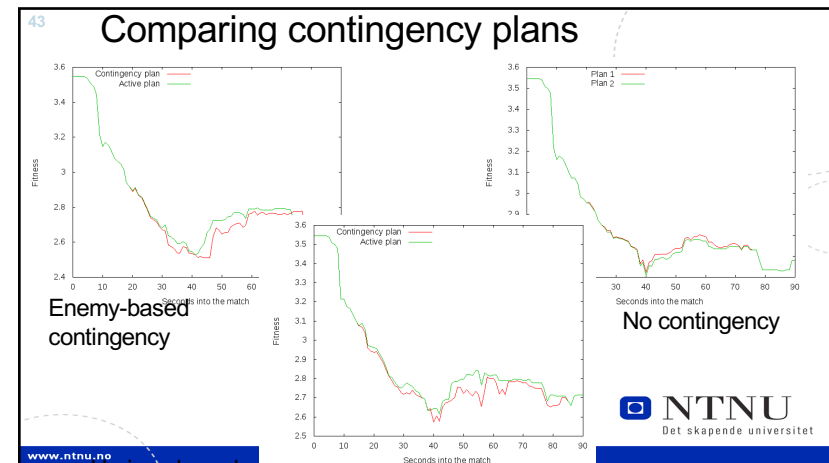
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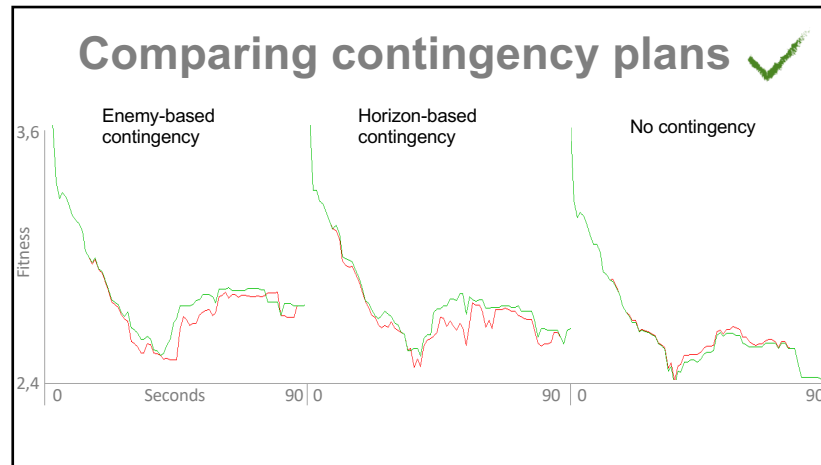
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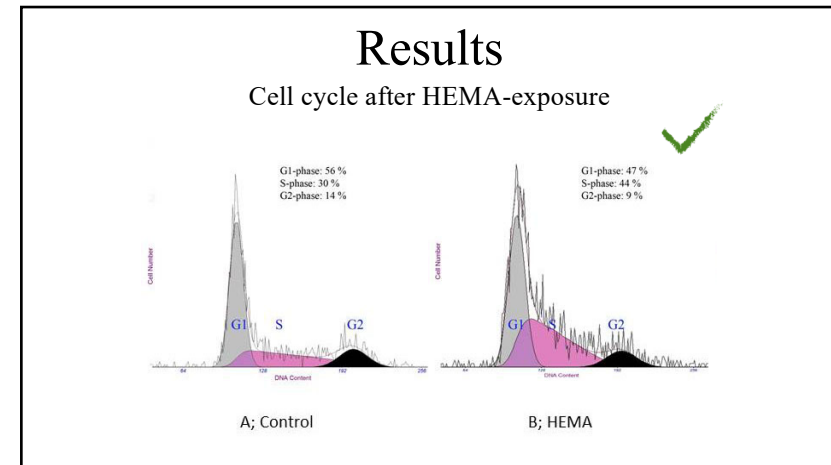
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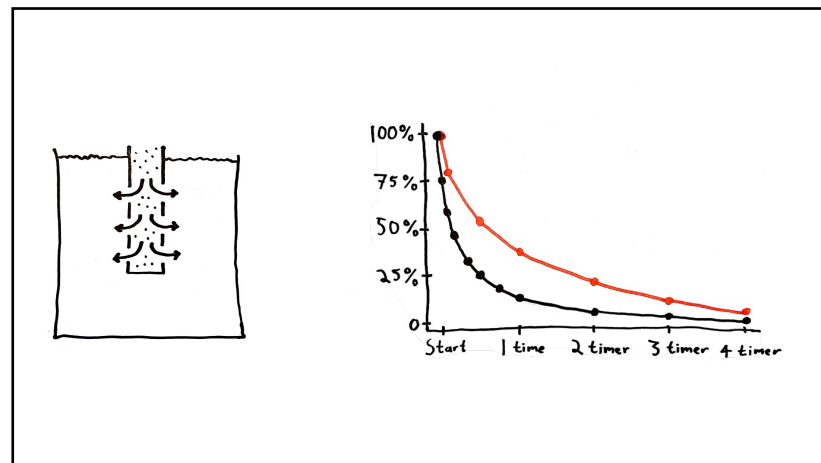
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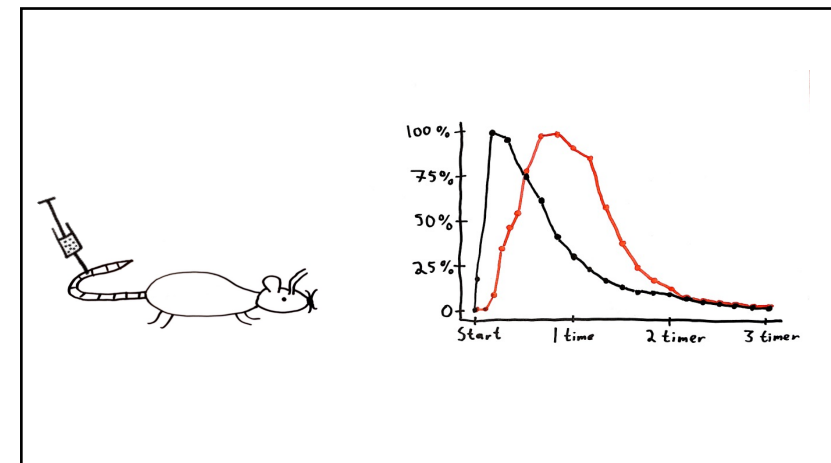
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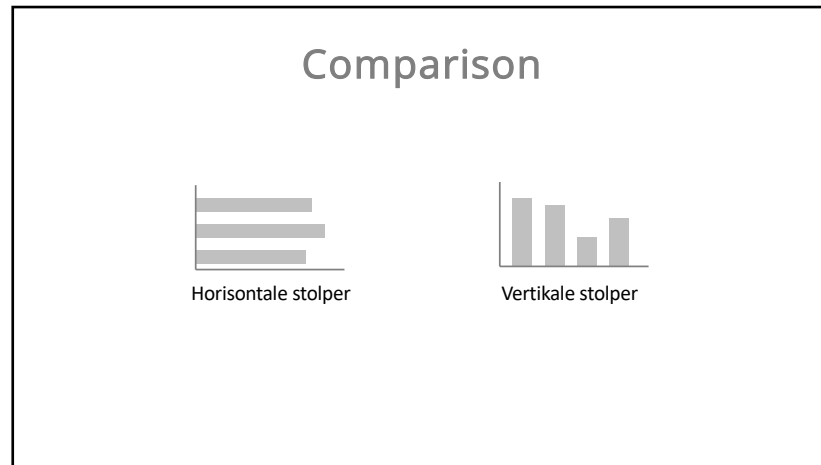
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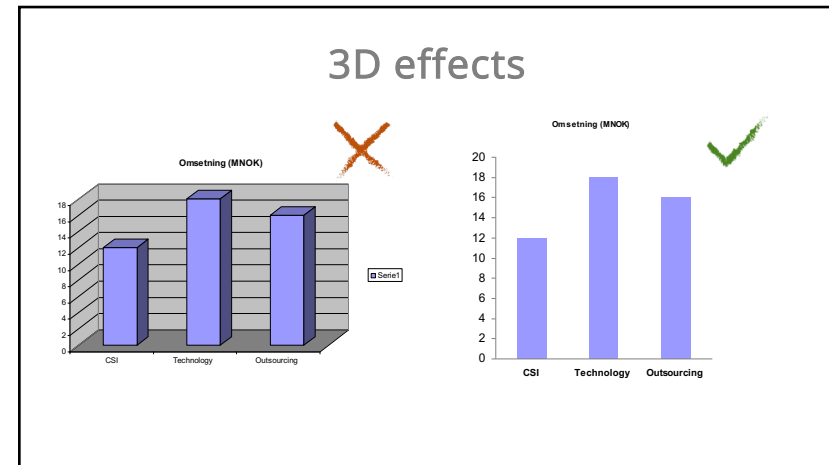
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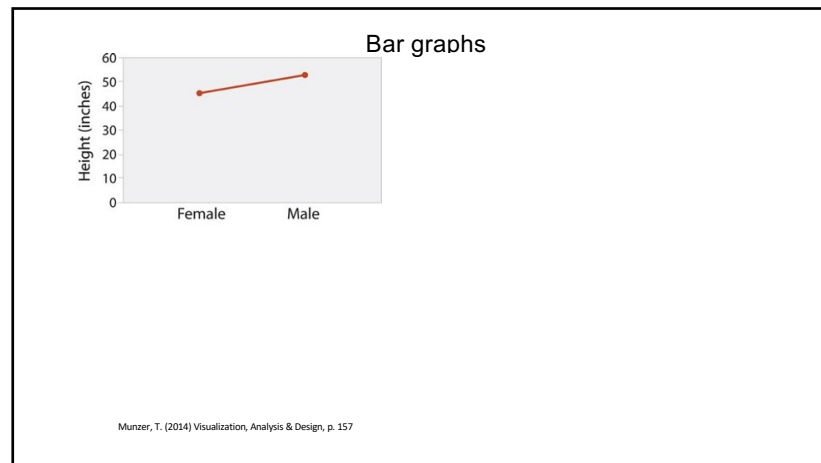
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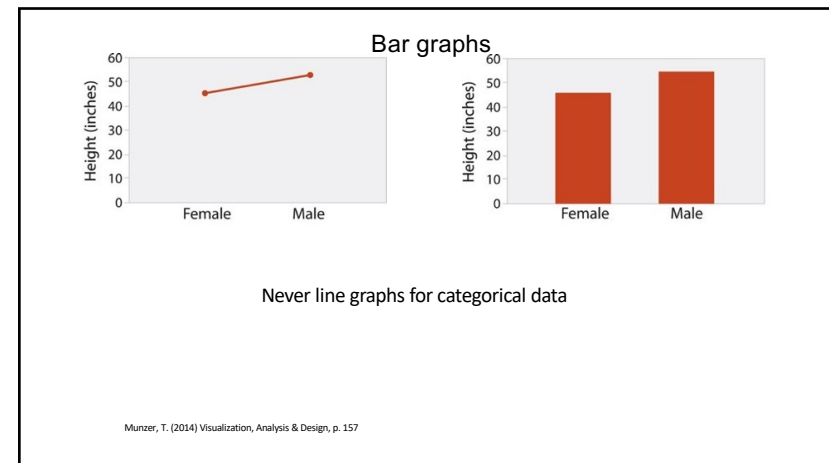
48



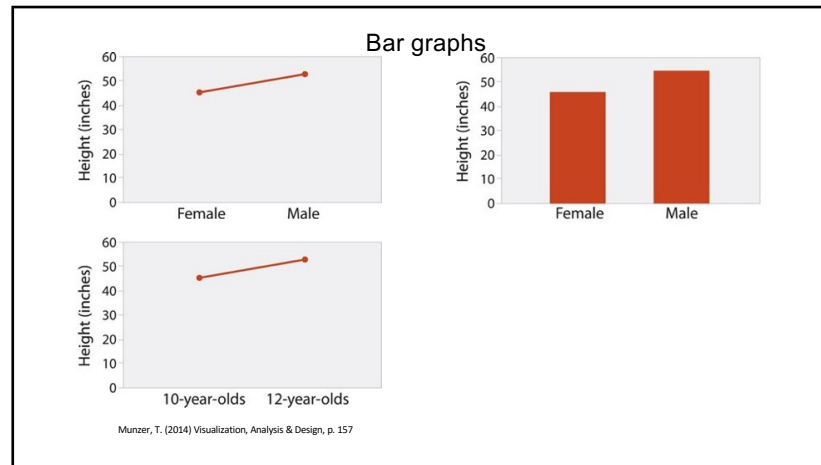
49



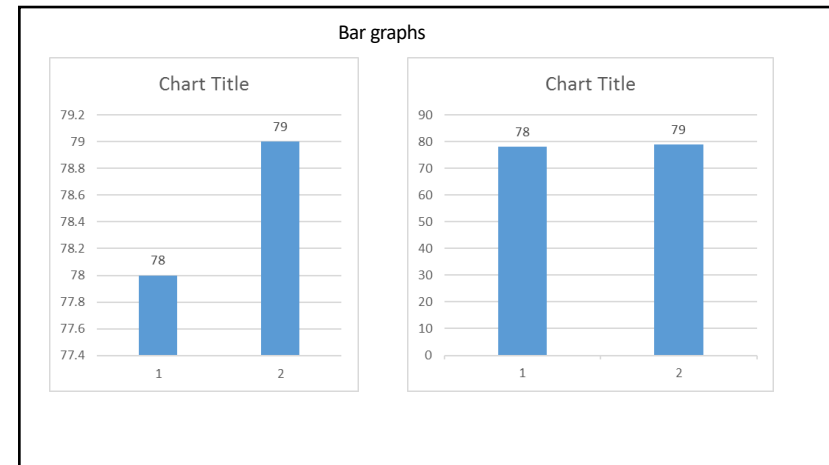
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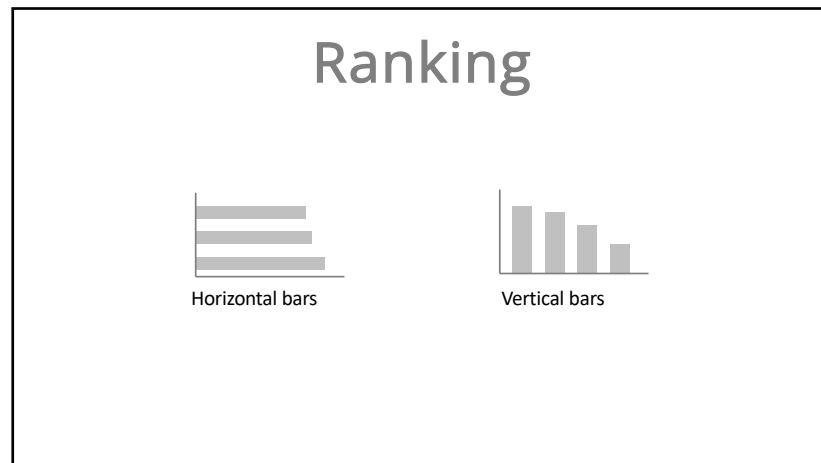
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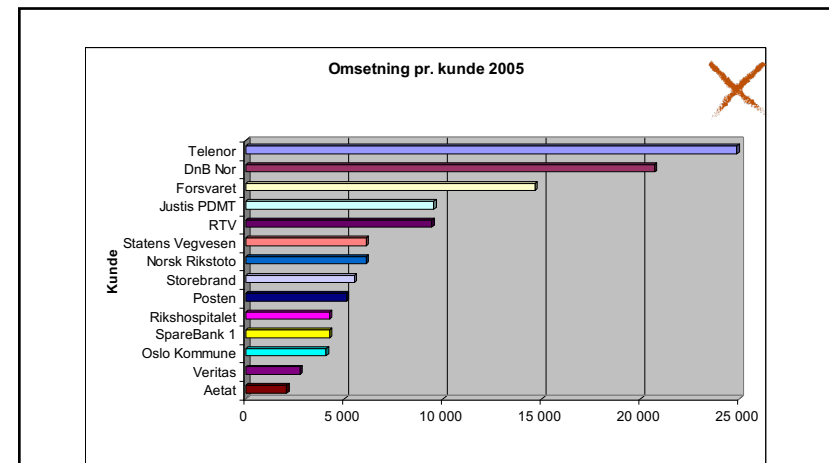
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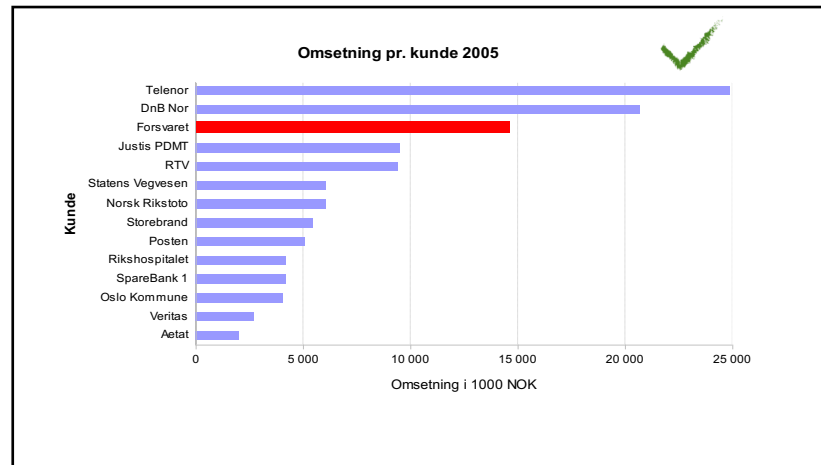
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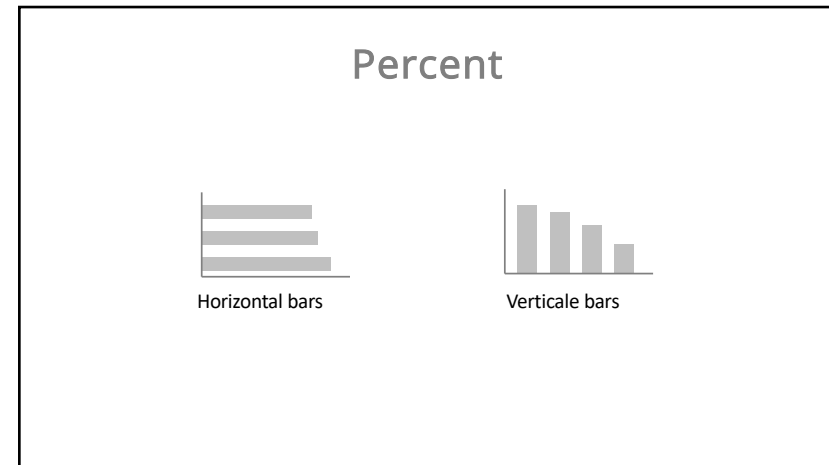
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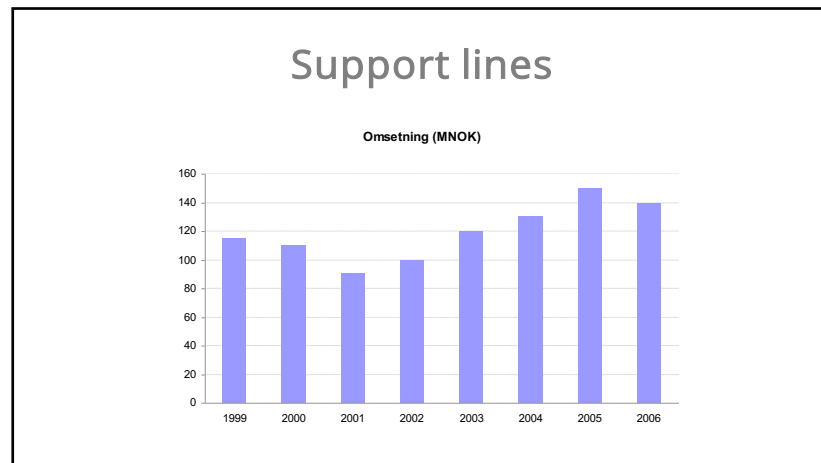
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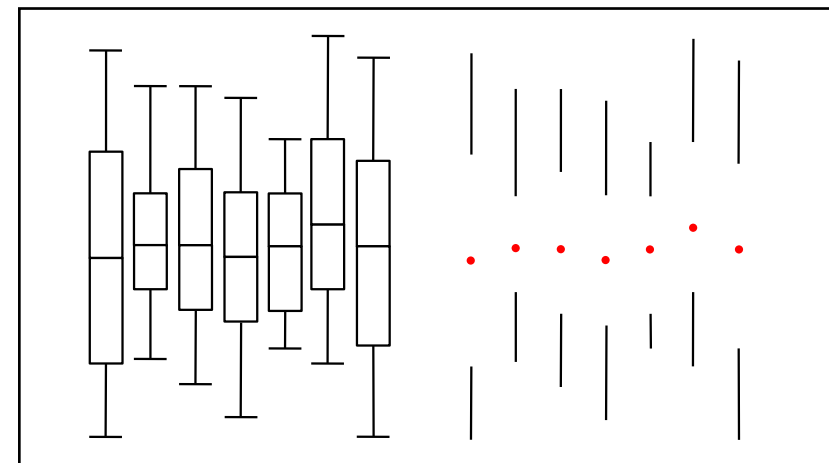
56



57



58

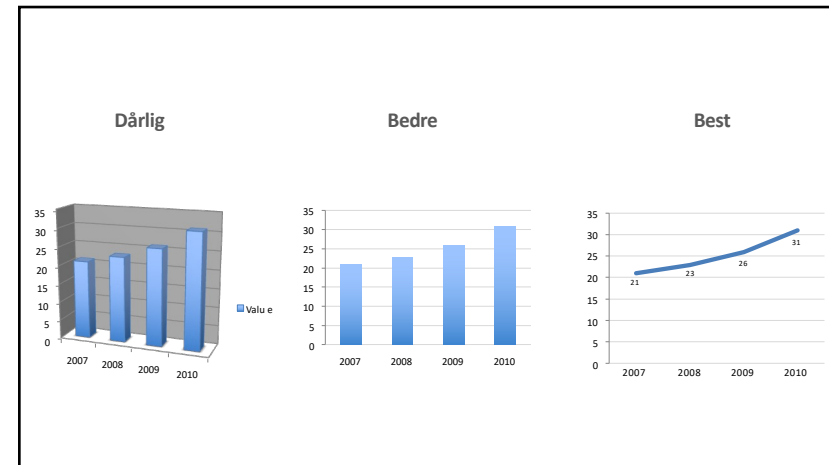


59

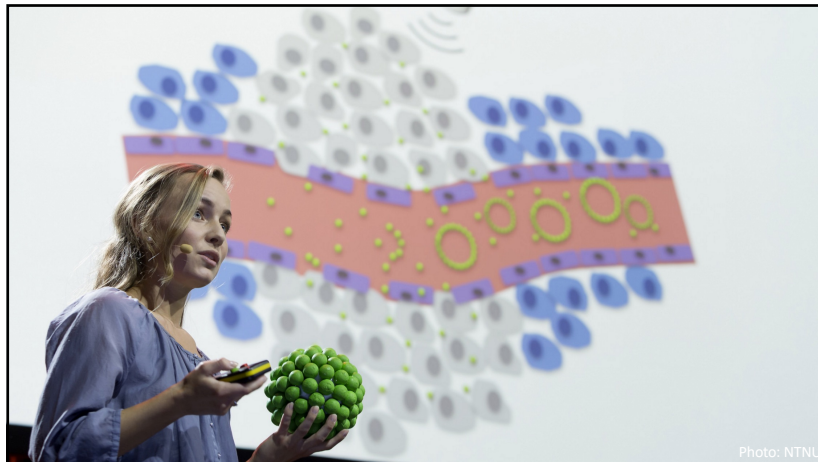
Hvordan designe gode grafer

1. Velg rett graftype
2. Fjern 3D-effekter
3. Fjern bakgrunn (område + linje)
4. Fjern unødvendig dataforklaring
5. Fjern eller ton ned støttelinjer
6. Fjern eller ton ned ramme rundt graf
7. Fjern ramme rundt stolpe
8. Fjern eller ton ned akser og aksemerking

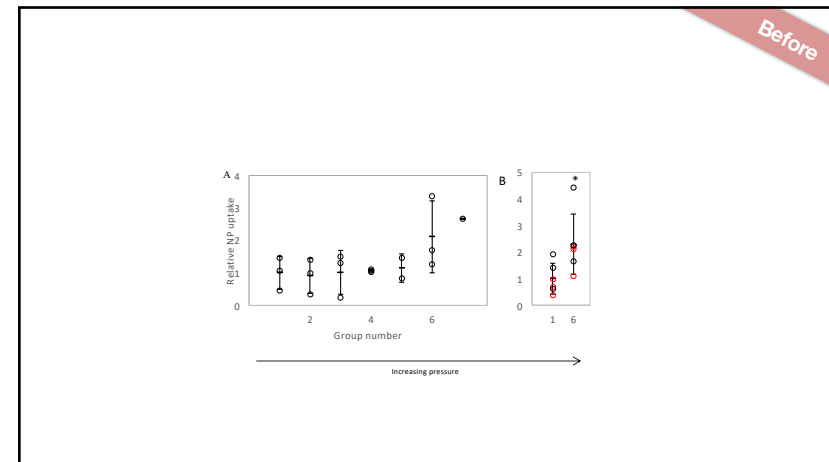
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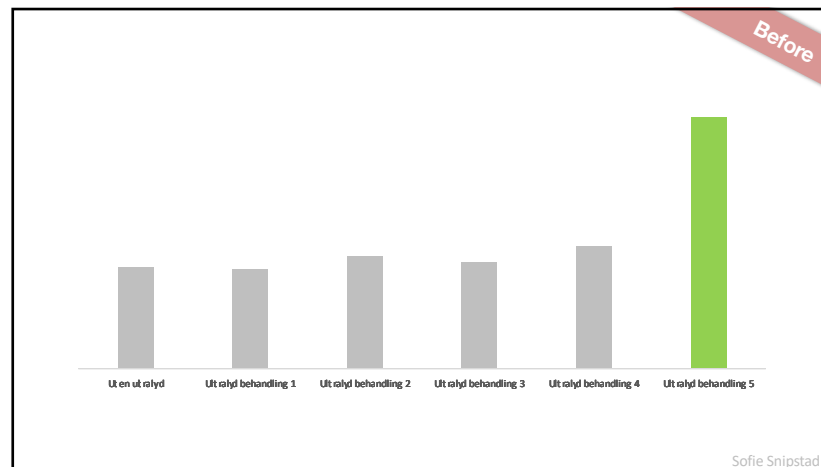
61



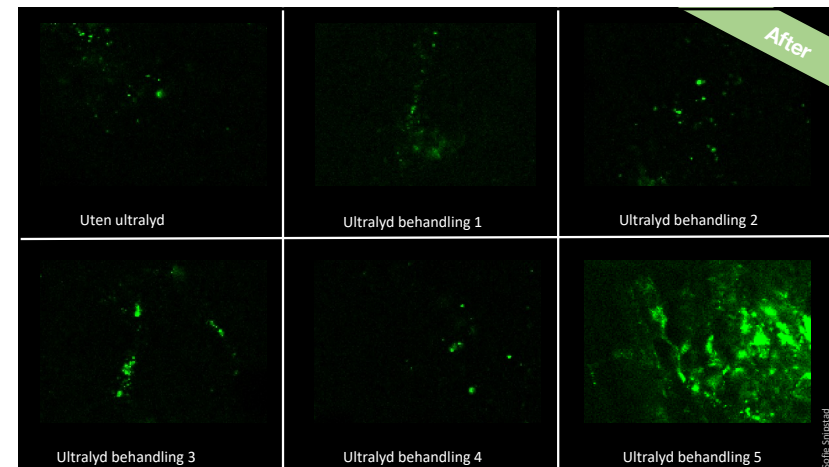
62



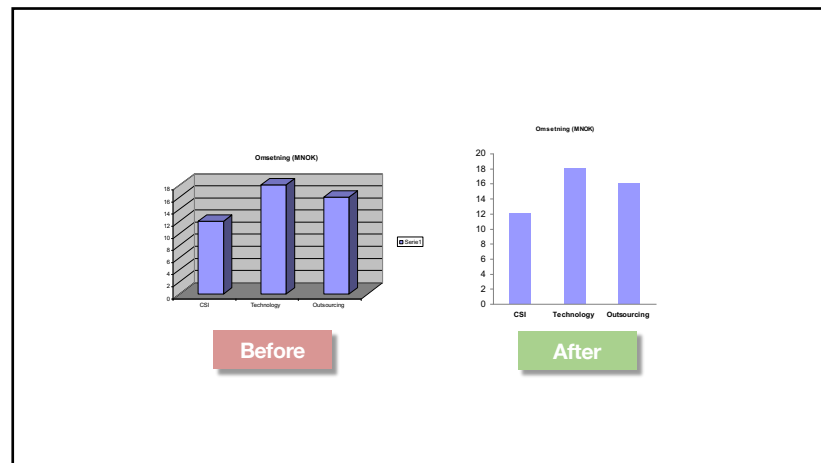
63



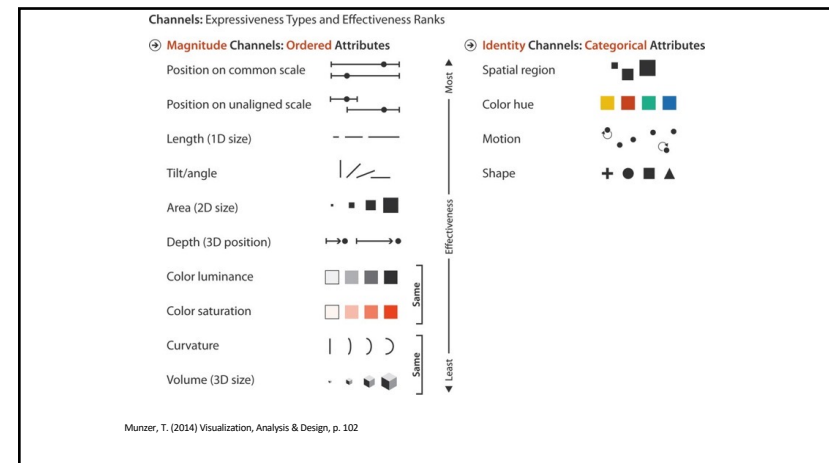
64



65



66



67