

# Tutorial 1

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## R Markdown

CTR + ALT + I creates a new R coding section

##Question 1.1.

```
data = read.csv("C:/Users/Gerett/Documents/University/2nd Year/Stats 244/Chapter 1/Data Sets/FUNDS2002.csv")
head(data)
```

	Fund	Type	Objective	Assets	Fees	ExpenseRatio	
## 1	Alger Large Cap Growth B	large cap	Growth	614.0	No	1.96	
## 2	Pioneer Value A	mid cap	Value	4189.6	Yes	0.94	
## 3	One Group Large Cap Value I	large cap	Value	1286.0	No	0.96	
## 4	Mairs and Power Growth	mid cap	Value	656.3	No	0.78	
## 5	Royce Low Priced Stock	small cap	Value	852.1	No	1.49	
## 6	Franklin California Growth A	mid cap	Growth	1433.5	Yes	0.88	
	Return2001	R3Yr.Return	R5.Yr.Return	Turnover	Risk	BestQuarter	WorstQuarter
## 1	-12.9	-0.9	11.5	average	high	25.0	-18.4
## 2	-3.1	4.5	5.4	very low	average	15.5	-22.3
## 3	-13.0	1.1	8.2	high	average	15.5	-16.5
## 4	6.5	13.0	15.2	very low	low	19.0	-13.2
## 5	25.1	26.2	19.7	average	average	27.7	-21.5
## 6	-23.2	11.7	12.3	very low	high	56.4	-26.0

```
lrg_cap = data[data$Type == "large cap ",]
lrg_cap
```

	Fund	Type	Objective	Assets	Fees
## 1	Alger Large Cap Growth B	large cap	Growth	614.0	No
## 3	One Group Large Cap Value I	large cap	Value	1286.0	No
## 7	Putnam New Opportunities A	large cap	Growth	10511.6	Yes
## 8	Putnam Equity Income A	large cap	Value	1247.9	Yes
## 9	Neuberger Berman Guardian Inv	large cap	Value	1949.3	No
## 10	MFS Growth Opportunities A	large cap	Growth	696.1	Yes
## 11	Franklin Growth A	large cap	Value	1871.3	Yes
## 13	White Oak Growth	large cap	Growth	3671.3	No
## 14	MFS Value A	large cap	Value	1199.2	Yes
## 15	ABN Amro Montag & Calswell Growth I	large cap	Growth	1184.9	No
## 16	Ameristock	large cap	Value	1127.6	No
## 17	AXP New Dimensions A	large cap	Growth	12871.4	Yes
## 18	John Hancock Large Cap Value A	large cap	Value	765.1	Yes
## 19	MS Growth B	large cap	Growth	784.6	No
## 21	T. Rowe Price Growth and Income	large cap	Value	2390.7	No
## 22	AIM Weingarten A	large cap	Growth	4134.7	Yes
## 23	Fidelity Independence	large cap	Growth	5485.4	No

## 24	Guardian Park Avenue A large cap	Growth	1793.8	Yes
## 25	Putnam Investors A large cap	Growth	5073.3	Yes
## 29	Dreyfus Premier Core Value A large cap	Value	678.0	Yes
## 32	Putnam Classic Equity A large cap	Value	1159.2	Yes
## 33	Federated American Leaders A large cap	Value	1594.2	Yes
## 34	Columbia Growth large cap	Growth	1347.0	No
## 35	Prudential Jennison Growth A large cap	Growth	1280.8	Yes
## 36	Fidelity Large Cap Stock large cap	Growth	647.5	No
## 37	Scudder Large Company Value large cap	Value	2167.7	No
## 38	Northern Growth Equity large cap	Growth	873.7	No
## 39	Amer. Century Growth Inv. large cap	Growth	6280.4	No
## 40	USAA Income Stock large cap	Value	1830.8	No
## 41	Fidelity Contrafund large cap	Growth	31836.6	Yes
## 42	Janus Growth and Income large cap	Growth	6983.9	No
## 44	Icap Equity large cap	Value	1108.4	No
## 45	Dreyfus Premier Third Century Z large cap	Growth	850.0	No
## 46	Rainier Core Equity large cap	Growth	712.4	No
## 47	AIM Value B large cap	Growth	9232.2	No
## 48	Merrill Lynch Fundamental Growth B large cap	Growth	2271.8	No
## 49	Scudder Growth A large cap	Growth	1373.2	Yes
## 50	Dreyfus Growth & Income large cap	Value	1123.8	No
## 52	Consulting Group Large Cap Growth large cap	Growth	1667.2	No
## 55	Sequoia large cap	Value	4058.0	No
## 56	Strong Large Cap Growth large cap	Growth	995.5	No
## 59	Consulting Group Large Val. Eq. large cap	Value	1528.0	No
## 61	T. Rowe Price Blue Chip Growth large cap	Growth	6142.5	No
## 62	Mainstay Capital Appreciation B large cap	Growth	2027.1	No
## 66	Scudder Capital Growth AARP large cap	Growth	1438.9	No
## 67	Nuveen Large Cap Value A large cap	Value	662.1	Yes
## 68	Van Kampen Comstock A large cap	Value	3651.4	Yes
## 69	Fidelity Aggressive Growth large cap	Growth	7439.0	No
## 70	Fidelity large cap	Growth	12249.4	No
## 71	Alliance Growth & Income B large cap	Value	3628.8	No
## 73	Fidelity Trend large cap	Growth	994.8	No
## 74	Scudder Large Company Growth large cap	Growth	795.8	No
## 75	Fidelity Advisor Equity Income T large cap	Value	2060.0	Yes
## 77	Oppenheim Growth A large cap	Growth	1547.5	Yes
## 78	MS Value Added Market B large cap	Value	1019.4	No
## 80	Vanguard U.S. Growth large cap	Growth	9543.1	No
## 83	Fidelity Disciplined Equity large cap	Growth	2965.5	No
## 84	Fidelity Stock Selector large cap	Growth	1079.7	No
## 86	Mainstay Value B large cap	Value	746.7	No
## 87	Neuberger Berman Partners Inv large cap	Value	1655.2	No
## 88	Merrill Lynch Basic Value B large cap	Value	2496.4	No
## 90	Delaware Decatur Equity Income A large cap	Value	1132.5	Yes
## 91	AXP Blue Chip Advantage A large cap	Growth	1594.6	Yes
## 92	Vanguard Equity Income large cap	Value	2242.0	No
## 93	Amer. Century Equity Growth Inv. large cap	Growth	1481.2	No
## 94	Longleaf Partners large cap	Value	4166.0	No
## 95	Tweedy Browne American Value large cap	Value	914.9	No
## 96	Investment Company of America A large cap	Value	54008.1	Yes
## 97	MS American Opportunity B large cap	Growth	6307.2	No
## 98	AXP Equity Value A large cap	Value	1132.0	Yes
## 99	Oppenheim Capital Appreciation A large cap	Growth	3240.0	Yes

## 100	Dodge & Cox Stock	large cap	Value	8768.5	No
## 101	MFS Emerging Growth A	large cap	Growth	4636.6	Yes
## 102	MS Dividend Growth Secs B	large cap	Value	10010.8	No
## 104	Van Kampen Pace A	large cap	Growth	2253.7	Yes
## 106	Security Equity	large cap	Growth	612.0	Yes
## 107	Fidelity Equity Income	large cap	Value	21636.2	No
## 111	Safeco Equity	large cap	Value	1088.7	No
## 112	Domini Social Equity	large cap	Growth	1207.1	No
## 113	Salomon Brothers Investment Value	large cap	Value	655.7	No
## 116	Excelsior Value & Restructuring	large cap	Value	2124.2	No
## 117	Amer. Century Select Inv.	large cap	Growth	4988.9	No
## 119	Seligman Growth A	large cap	Growth	686.7	Yes
## 120	Massachusetts Investors Growth Stk A	large cap	Growth	8398.2	Yes
## 123	Vanguard Growth Inv	large cap	Growth	8500.6	No
## 126	Fidelity OTC	large cap	Growth	8087.4	No
## 127	State Farm Growth	large cap	Growth	2536.8	No
## 128	Dreyfus Appreciation	large cap	Growth	3427.9	No
## 130	Washington Mutual Investors A	large cap	Value	48135.1	Yes
## 133	Alger Capital Appreciation B	large cap	Growth	614.0	No
## 135	USAA Growth	large cap	Growth	1094.9	No
## 136	Waddell & Reed Adv Core Invmnt A	large cap	Growth	6439.4	Yes
## 137	Mutual Qualified Z	large cap	Value	2956.9	No
## 138	AXP Growth A	large cap	Growth	3288.6	Yes
## 139	Credit Suisse Capital Appreciation Cmn.	large cap	Growth	963.5	No
## 140	Vanguard Windsor II Inv	large cap	Value	22105.0	No
## 141	Van Kampen Growth & Income A	large cap	Value	1702.5	Yes
## 142	Fidelity Advisor Growth Opportunities T	large cap	Value	8152.0	Yes
## 143	USAA Growth & Income	large cap	Value	1050.4	No
## 145	Fidelity Advisor Equity Growth T	large cap	Growth	7129.9	Yes
## 148	Fidelity Magellan	large cap	Growth	78790.2	Yes
## 152	Dreyfus	large cap	Value	1868.0	No
## 153	John Hancock Sovereign Investor A	large cap	Growth	1217.8	Yes
## 154	Sentinel Common Stock A	large cap	Value	1130.4	Yes
## 155	T. Rowe Price Growth Stock	large cap	Growth	4615.3	No
## 156	Fidelity Growth Company	large cap	Growth	22409.6	No
## 157	Smith Barney Aggressive Growth	large cap	Growth	2106.0	Yes
## 158	Aim Basic Value A	large cap	Value	1863.9	Yes
## 159	Janus Special Situations	large cap	Growth	1024.6	No
## 160	Waddell & Reed Adv Accumulative A	large cap	Value	2096.3	Yes
## 161	Invesco Growth Inv	large cap	Growth	964.0	No
## 166	Prudential Equity A	large cap	Value	1563.2	Yes
## 167	Selected American	large cap	Value	5456.9	No
## 169	Vanguard Windsor	large cap	Value	15798.6	No
## 172	Fidelity Equity Income II	large cap	Value	12032.9	No
## 173	Idex Janus Growth A	large cap	Growth	879.7	Yes
## 174	T. Rowe Price Equity Income	large cap	Value	9988.7	No
## 175	Van Kampen Enterprise A	large cap	Growth	1752.9	Yes
## 176	Janus	large cap	Growth	25757.0	No
## 178	Steinroe Investment Growth Stock	large cap	Growth	598.5	No
## 180	Fidelity Dividend Growth	large cap	Value	14388.3	No
## 186	Lord Abbett Affiliated A	large cap	Value	10041.1	Yes
## 187	Putnam New Value A	large cap	Value	608.7	Yes
## 191	Smith Barney Fundamental Value B	large cap	Value	1567.9	No
## 194	Fidelity Blue Chip Growth	large cap	Growth	21859.4	No

## 195	Invesco Equity Income Inv	large cap	Value	3439.5	No	
## 197	Berger Growth	large cap	Growth	847.0	No	
## 198	Vanguard Growth Equity	large cap	Growth	740.4	No	
## 200	Wells Fargo Large Company Growth	large cap	Growth	1286.4	No	
## 201	Federated Stock Trust	large cap	Value	1573.0	No	
## 202	Vanguard Morgan Growth	large cap	Growth	3460.1	No	
## 205	Franklin Growth & Income A	large cap	Growth	956.2	Yes	
## 206	Growth Fund of America A	large cap	Growth	35402.0	Yes	
## 208	J P Morgan Growth and Inc A	large cap	Value	876.5	Yes	
## 210	Alliance Premier Growth B	large cap	Growth	5788.9	No	
## 211	Evergreen Omega B	large cap	Growth	863.4	No	
## 212	Pioneer Growth Shares A	large cap	Growth	864.6	Yes	
## 215	Waddell & Reed Adv Vanguard A	large cap	Growth	1800.7	Yes	
## 217	American Mutual A	large cap	Value	8836.3	Yes	
## 218	Janu Aspen Growth Instl	large cap	Growth	2446.9	No	
## 219	Liberty Growth and Income B	large cap	Value	915.4	No	
## 221	AXP Diversified Equity Income A	large cap	Value	1615.3	Yes	
## 222	Phoenix-Engemann Capital Growth A	large cap	Growth	1320.7	Yes	
## 223	Armada Equity Growth I	large cap	Growth	840.4	No	
## 224	Amer. Century Ultra Inv.	large cap	Growth	26453.2	No	
## 226	Eaton Vance Tax-Mgd. Growth 1.1 B	large cap	Growth	3347.1	No	
## 227	Putnam Growth Opportunities A	large cap	Growth	1866.7	Yes	
## 228	Scudder Dreman High Return A	large cap	Value	2104.1	Yes	
## 229	Torray	large cap	Value	1609.2	No	
## 230	AIM Summit I	large cap	Growth	1912.5	Yes	
## 232	Vanguard Value Inv	large cap	Value	3013.5	No	
## 233	Gabelli Growth	large cap	Growth	2998.9	No	
## 234	Harbor Capital Appreciation	large cap	Growth	6745.0	No	
## 235	Wells Fargo Equity Income	large cap	Value	1250.1	No	
## 236	Oppenheim Quest Opp. Value A	large cap	Value	12324.2	Yes	
## 237	Davis NY Venture A	large cap	Value	10240.5	Yes	
## 238	Armada Large Cap value I	large cap	Value	679.3	No	
## 239	PIMCO Growth C	large cap	Growth	1223.5	No	
## 243	MS Instl Value Adv	large cap	Value	835.3	No	
## 244	MFS Strategic Growth A	large cap	Growth	1146.8	Yes	
## 245	TCW Galileo Select Equity I	large cap	Growth	979.3	No	
## 246	Dreyfus Founders Growth F	large cap	Growth	905.3	No	
## 247	Enterprise Growth A	large cap	Growth	809.8	Yes	
## 248	Oppenheim Quest Value A	large cap	Value	602.5	Yes	
## 249	Putnam Voyager A	large cap	Growth	15936.5	Yes	
## 250	Janus Twenty	large cap	Growth	15300.3	No	
## 253	Smith Barney Large Cap Core	large cap	Growth	3382.7	Yes	
## 256	Goldman Sachs Capital Growth A	large cap	Growth	1990.0	Yes	
## 257	Columbia Common Stock	large cap	Growth	676.6	No	
## 258	Alliance Growth B	large cap	Growth	2434.1	No	
## 259	Rydex OTC Inv	large cap	Growth	1001.7	No	
##	ExpenseRatio	Return2001	R3Yr.Return	R5.Yr.Return	Turnover	Risk
## 1	1.96	-12.9	-0.9	11.5	average	high
## 3	0.96	-13.0	1.1	8.2	high	average
## 7	0.89	-30.1	-4.3	6.0	average	high
## 8	0.96	-1.6	4.0	9.9	average	low
## 9	0.84	-1.8	1.5	4.8	high	average
## 10	0.80	-24.7	-3.9	7.2	high	high
## 11	0.91	-9.5	3.0	9.0	very low	low

## 13	0.96	-39.1	-1.8	10.5	very low	high
## 14	1.21	-7.8	8.4	14.9	average	low
## 15	0.77	-13.1	-0.2	11.7	low	average
## 16	0.83	2.3	8.2	17.1	very low	low
## 17	1.00	-15.5	0.4	10.1	low	average
## 18	1.14	-3.4	9.0	15.4	high	average
## 19	1.59	-16.0	1.0	8.8	average	average
## 21	0.77	-2.2	3.4	8.5	average	low
## 22	1.03	-34.1	-10.9	3.5	high	high
## 23	0.85	-27.2	2.9	11.9	very high	high
## 24	0.79	-21.7	-6.0	6.3	high	high
## 25	0.89	-24.8	-7.3	7.8	average	high
## 29	1.15	-4.0	7.8	10.9	high	low
## 32	0.94	-6.8	-0.7	6.6	average	low
## 33	1.16	-4.6	1.3	10.0	low	low
## 34	0.65	-21.4	-3.0	8.5	high	high
## 35	0.81	-18.6	-1.8	11.5	average	high
## 36	0.93	-17.7	-2.9	9.3	high	average
## 37	0.89	-12.5	1.6	8.8	average	low
## 38	1.00	-16.7	-1.5	10.7	average	average
## 39	1.00	-18.7	-2.2	10.6	average	average
## 40	0.67	-4.2	2.7	8.4	low	low
## 41	0.84	-12.6	0.6	10.5	high	low
## 42	0.88	-14.4	4.7	15.8	low	average
## 44	0.80	-0.6	7.6	12.4	high	low
## 45	0.95	-23.7	-4.7	7.8	average	average
## 46	1.11	13.3	1.8	11.2	average	average
## 47	1.77	-13.6	-2.1	8.8	average	average
## 48	1.81	-20.2	-0.1	11.7	high	average
## 49	1.02	-23.0	-5.4	2.5	average	high
## 50	0.96	-6.1	1.8	6.6	average	average
## 52	0.77	-20.7	-6.4	7.8	high	high
## 55	1.00	10.5	3.5	16.5	low	low
## 56	1.00	-32.3	-2.0	9.0	average	high
## 59	0.78	-4.8	2.1	9.4	average	low
## 61	0.91	-14.4	0.0	10.5	average	average
## 62	1.74	-24.5	-6.2	7.1	low	high
## 66	0.88	-20.4	-1.1	10.1	low	average
## 67	1.32	-2.3	6.4	11.1	high	low
## 68	0.93	-1.8	9.9	15.7	high	low
## 69	0.89	-47.3	-7.9	5.9	high	very high
## 70	0.51	-11.2	-0.6	11.2	high	average
## 71	1.67	-2.5	6.6	13.3	average	low
## 73	0.52	-12.4	4.6	5.0	very high	high
## 74	1.07	-22.7	-5.5	8.3	average	high
## 75	1.18	-2.4	3.3	10.0	high	low
## 77	1.06	-24.5	-0.5	5.2	average	high
## 78	1.59	-3.0	5.7	10.7	very low	low
## 80	0.44	-31.7	-12.6	3.3	high	high
## 83	0.84	-14.2	0.4	10.5	average	average
## 84	0.63	-14.4	0.2	8.2	high	average
## 86	1.95	-2.4	5.2	5.5	high	average
## 87	0.84	-3.0	1.7	7.6	average	average
## 88	1.57	-1.5	3.4	9.4	low	low

## 90	1.12	-3.7	0.7	7.9	average	low
## 91	0.85	-17.0	-4.0	6.5	high	average
## 92	0.47	-2.3	3.4	11.2	low	low
## 93	0.67	-11.0	-2.1	9.9	average	average
## 94	0.93	10.3	10.8	14.8	low	low
## 95	1.36	-0.1	5.3	12.2	very low	low
## 96	0.56	-4.6	4.9	13.0	low	low
## 97	1.28	-27.3	-1.5	10.5	very high	average
## 98	0.95	-4.4	2.0	7.5	high	low
## 99	1.03	-12.7	7.0	13.9	low	average
## 100	0.54	9.3	15.2	15.6	low	low
## 101	1.09	-25.8	-6.0	4.5	low	high
## 102	1.42	-9.2	-1.8	7.0	very low	low
## 104	0.87	-16.2	-5.8	5.8	high	average
## 106	1.02	-11.8	-5.1	7.0	low	average
## 107	0.67	-5.0	3.4	10.1	low	low
## 111	0.89	-9.7	-4.2	6.4	low	average
## 112	0.93	-12.8	-3.1	10.5	very low	average
## 113	0.73	-4.2	7.3	12.5	average	low
## 116	0.95	-5.0	13.1	16.3	low	average
## 117	1.00	-18.2	-3.0	10.4	average	average
## 119	1.14	-19.3	-4.1	7.1	high	high
## 120	0.85	-24.8	-1.1	15.0	very high	average
## 123	0.22	-13.0	-4.5	11.1	low	average
## 126	0.94	-24.1	-1.4	8.1	very high	high
## 127	0.11	-10.8	0.1	9.6	very low	average
## 128	0.88	-10.7	0.0	10.8	very low	low
## 130	0.65	1.5	3.8	12.2	low	low
## 133	2.11	-18.7	-1.0	9.9	high	high
## 135	0.99	-23.8	-9.1	0.5	average	high
## 136	0.98	-15.3	2.6	11.3	very low	low
## 137	0.80	8.2	12.0	12.0	average	very low
## 138	0.99	-31.3	-8.1	2.8	low	high
## 139	0.98	-24.4	2.1	11.9	high	average
## 140	0.37	-3.4	2.1	10.4	low	low
## 141	0.88	-6.1	8.0	13.2	high	low
## 142	1.03	-15.1	-10.3	2.8	high	average
## 143	0.89	-6.1	3.4	8.2	low	low
## 145	1.26	-18.2	-0.4	11.1	average	average
## 148	0.88	-11.7	-0.2	11.0	low	average
## 152	0.71	-10.1	-1.5	4.4	average	average
## 153	1.08	-6.1	1.2	9.1	average	low
## 154	1.03	-10.0	0.8	8.4	average	low
## 155	0.73	-9.8	3.4	12.2	average	average
## 156	0.85	-22.3	7.9	13.7	average	high
## 157	1.99	-5.0	22.8	26.3	very low	average
## 158	1.32	0.1	16.7	16.7	average	low
## 159	0.94	-16.0	1.8	14.1	average	average
## 160	1.04	-15.4	8.5	15.2	very high	low
## 161	1.16	-49.1	-18.7	-0.7	high	very high
## 166	0.62	-12.1	1.2	6.8	average	average
## 167	0.92	-11.2	5.3	13.3	low	low
## 169	0.31	5.7	11.0	10.9	average	average
## 172	0.63	-7.2	1.4	10.2	very high	low

## 173	1.40	-28.3	-6.6	9.3	low	high
## 174	0.60	1.6	6.1	10.9	low	low
## 175	0.89	-20.7	-5.2	6.2	high	high
## 176	0.84	-26.1	-2.6	9.5	average	high
## 178	0.95	-23.9	-2.7	8.8	average	high
## 180	0.94	-3.7	5.5	15.4	high	low
## 186	0.79	-7.9	7.4	12.2	average	low
## 187	1.11	3.3	8.0	9.6	average	low
## 191	1.83	-7.0	11.7	12.9	average	low
## 194	0.87	-16.6	-2.5	9.7	low	average
## 195	0.96	-11.8	1.2	8.4	low	low
## 197	1.13	-32.5	-5.9	1.9	average	high
## 198	0.77	-27.4	-5.0	9.2	very high	high
## 200	0.97	-21.6	0.2	14.7	very low	high
## 201	0.94	0.8	3.3	11.7	low	low
## 202	0.40	-13.6	0.5	10.1	average	average
## 205	0.90	-23.1	5.7	11.1	low	high
## 206	0.71	-12.3	11.2	18.1	low	average
## 208	1.30	-13.5	-2.1	6.8	very low	average
## 210	2.13	-24.5	-8.3	8.5	high	high
## 211	2.06	-16.2	0.9	9.9	high	high
## 212	1.22	-19.2	-7.7	8.5	average	average
## 215	1.11	-24.7	2.4	11.0	average	average
## 217	0.59	6.7	2.8	11.0	low	very low
## 218	0.67	-24.7	-2.5	9.0	low	average
## 219	2.07	-1.2	8.0	15.0	high	low
## 221	0.95	2.7	3.3	8.1	high	low
## 222	1.06	-35.2	-11.8	1.8	average	high
## 223	0.93	-16.3	-0.8	11.5	low	average
## 224	0.99	-14.6	-1.1	9.9	average	high
## 226	1.54	-10.7	2.0	11.6	very low	low
## 227	0.99	-32.2	-9.0	7.6	average	high
## 228	1.27	1.2	7.5	12.9	very low	low
## 229	1.06	-0.5	6.0	12.1	average	average
## 230	0.72	-33.8	-5.2	7.3	average	high
## 232	0.22	-11.9	1.7	9.4	low	average
## 233	1.38	-24.1	-0.2	12.9	average	average
## 234	0.64	-17.7	-0.1	12.4	average	high
## 235	0.85	-5.4	1.4	9.5	very low	low
## 236	1.53	-4.6	4.6	8.2	average	low
## 237	0.89	-11.4	4.6	11.9	low	average
## 238	0.97	-3.8	2.4	8.8	average	low
## 239	1.90	-29.6	-5.7	7.2	average	high
## 243	0.87	4.3	7.8	8.4	low	average
## 244	1.37	-25.1	-1.3	16.0	average	high
## 245	0.85	-19.2	2.7	12.9	average	high
## 246	1.06	-24.9	-8.8	3.8	high	high
## 247	1.41	-13.4	-0.9	10.9	average	average
## 248	1.56	-7.9	1.3	7.6	average	low
## 249	0.88	-22.5	0.2	9.5	high	high
## 250	0.85	-29.2	-7.6	12.2	low	high
## 253	0.71	-14.8	1.3	11.3	very low	average
## 256	1.42	-15.5	-0.2	12.5	low	average
## 257	0.75	-17.6	-0.8	9.1	average	average

## 258	1.97	-25.1	-8.9	4.0	average	high
## 259	1.16	-34.7	-6.6	13.1	very high	very high
##	BestQuarter	WorstQuarter				
## 1	25.0	-18.4				
## 3	15.5	-16.5				
## 7	50.0	-29.3				
## 8	13.9	-10.2				
## 9	23.1	-26.2				
## 10	30.2	-24.0				
## 11	14.0	-15.4				
## 13	37.5	-33.3				
## 14	13.7	-11.1				
## 15	27.1	-15.5				
## 16	18.3	-10.1				
## 17	24.3	-15.7				
## 18	31.7	-24.0				
## 19	25.1	-18.5				
## 21	12.9	-10.8				
## 22	28.0	-27.7				
## 23	35.7	-24.9				
## 24	25.1	-20.5				
## 25	25.3	-20.3				
## 29	15.3	-14.6				
## 32	17.0	-12.6				
## 33	16.1	-12.4				
## 34	25.6	-22.0				
## 35	30.1	-20.0				
## 36	23.5	-19.0				
## 37	16.0	-14.7				
## 38	24.8	-15.8				
## 39	23.6	-19.3				
## 40	10.7	-8.3				
## 41	23.7	-13.2				
## 42	29.2	-15.9				
## 44	17.2	-17.5				
## 45	24.3	-18.0				
## 46	25.1	-15.2				
## 47	27.1	-16.0				
## 48	27.1	-15.1				
## 49	29.1	-22.2				
## 50	18.5	-16.4				
## 52	26.1	-22.9				
## 55	21.5	-14.4				
## 56	42.7	-26.5				
## 59	16.8	-14.1				
## 61	24.7	-17.2				
## 62	26.9	-20.1				
## 66	25.8	-20.6				
## 67	15.7	-16.6				
## 68	15.4	-13.5				
## 69	48.3	-40.3				
## 70	23.8	-18.3				
## 71	22.9	-14.1				
## 73	24.9	-27.0				



## 74	28.1	-21.2
## 75	17.8	-12.3
## 77	30.2	-25.6
## 78	16.5	-14.1
## 80	24.7	-31.0
## 83	21.0	-13.8
## 84	19.7	-15.9
## 86	13.2	-16.6
## 87	16.4	-15.9
## 88	14.2	-14.3
## 90	13.8	-10.5
## 91	20.2	-16.6
## 92	13.2	-8.4
## 93	23.1	-15.4
## 94	18.5	-18.4
## 95	15.7	-14.6
## 96	17.3	-10.2
## 97	34.9	-20.3
## 98	16.4	-13.9
## 99	28.9	-19.9
## 100	16.6	-14.3
## 101	35.9	-31.5
## 102	15.7	-13.3
## 104	20.5	-16.5
## 106	20.9	-15.0
## 107	16.2	-12.9
## 111	18.7	-11.5
## 112	24.6	-14.3
## 113	17.4	-12.8
## 116	28.0	-20.5
## 117	22.4	-14.6
## 119	24.2	-25.2
## 120	28.2	-21.6
## 123	24.6	-17.5
## 126	46.2	-32.0
## 127	19.8	-11.5
## 128	20.5	-10.8
## 130	14.4	-9.4
## 133	40.3	-26.6
## 135	26.1	-25.5
## 136	18.7	-14.6
## 137	13.4	-17.7
## 138	27.1	-28.2
## 139	33.0	-23.2
## 140	14.9	-13.6
## 141	15.9	-11.5
## 142	20.5	-16.6
## 143	17.5	-17.5
## 145	24.1	-22.1
## 148	27.2	-15.4
## 152	20.3	-14.7
## 153	15.6	-7.9
## 154	16.5	-11.7
## 155	23.1	-15.0

## 156	44.5	-26.5
## 157	37.6	-22.4
## 158	21.1	-17.3
## 159	28.5	-25.6
## 160	24.9	-12.6
## 161	34.5	-43.2
## 166	15.1	-15.9
## 167	22.2	-14.8
## 169	14.4	-19.4
## 172	20.8	-13.4
## 173	31.8	-31.7
## 174	13.3	-8.5
## 175	24.6	-21.5
## 176	28.4	-25.8
## 178	25.4	-20.1
## 180	19.5	-12.7
## 186	17.1	-14.0
## 187	16.4	-13.9
## 191	18.2	-17.6
## 194	23.4	-18.4
## 195	13.3	-13.5
## 197	42.9	-28.0
## 198	39.7	-29.0
## 200	31.6	-22.8
## 201	16.5	-11.8
## 202	25.9	-20.8
## 205	37.2	-21.3
## 206	27.2	-20.6
## 208	16.6	-14.3
## 210	30.8	-20.0
## 211	28.9	-25.7
## 212	24.1	-18.6
## 215	31.1	-21.9
## 217	12.4	-7.6
## 218	27.7	-24.8
## 219	21.4	-14.2
## 221	15.4	-11.9
## 222	26.7	-29.5
## 223	22.9	-16.1
## 224	32.1	-17.5
## 226	21.2	-14.0
## 227	36.1	-27.5
## 228	22.8	-12.7
## 229	21.3	-21.3
## 230	37.1	-30.3
## 232	17.5	-16.3
## 233	30.2	-22.3
## 234	30.0	-19.5
## 235	15.7	-10.4
## 236	12.6	-13.0
## 237	21.4	-14.4
## 238	12.6	-10.8
## 239	38.2	-23.7
## 243	15.7	-19.1

```
## 244      29.3      -25.4
## 245      31.2      -25.8
## 246      31.8      -25.0
## 247      26.8      -15.6
## 248      13.5      -13.6
## 249      40.2      -19.1
## 250      38.4      -25.4
## 253      23.6      -15.2
## 256      24.3      -16.5
## 257      23.3      -17.4
## 258      28.6      -23.8
## 259      53.0      -36.8
```

```
set.seed(5127)
sample_numbers_1 = sample(1:nrow(lrg_cap), 15, replace = FALSE)
sort(sample_numbers_1)
```

```
## [1] 19 28 54 81 87 99 108 109 115 119 126 145 155 164 165
```

```
l_sample = lrg_cap[sample_numbers_1,]
l_sample
```

```
##              Fund      Type Objective  Assets Fees
## 77      Oppenheim Growth A large cap    Growth  1547.5  Yes
## 116 Excelsior Value & Restructuring large cap    Value  2124.2  No
## 143      USAA Growth & Income large cap    Value  1050.4  No
## 127      State Farm Growth large cap    Growth  2536.8  No
## 176      Janus large cap    Growth  25757.0  No
## 158      Aim Basic Value A large cap    Value  1863.9  Yes
## 25      Putnam Investors A large cap    Growth  5073.3  Yes
## 224      Amer. Century Ultra Inv. large cap    Growth  26453.2  No
## 236      Oppenheim Quest Opp. Value A large cap    Value  12324.2  Yes
## 39      Amer. Century Growth Inv. large cap    Growth  6280.4  No
## 248      Oppenheim Quest Value A large cap    Value   602.5  Yes
## 249      Putnam Voyager A large cap    Growth  15936.5  Yes
## 172      Fidelity Equity Income II large cap    Value  12032.9  No
## 195      Invesco Equity Income Inv large cap    Value   3439.5  No
## 159      Janus Special Situations large cap    Growth  1024.6  No
##      ExpenseRatio Return2001 R3Yr.Return R5.Yr.Return  Turnover  Risk
## 77      1.06      -24.5      -0.5      5.2  average  high
## 116      0.95      -5.0      13.1      16.3    low average
## 143      0.89      -6.1      3.4      8.2    low  low
## 127      0.11     -10.8      0.1      9.6  very low average
## 176      0.84     -26.1     -2.6      9.5  average  high
## 158      1.32      0.1      16.7     16.7  average  low
## 25      0.89     -24.8     -7.3      7.8  average  high
## 224      0.99     -14.6     -1.1      9.9  average  high
## 236      1.53      -4.6      4.6      8.2  average  low
## 39      1.00     -18.7     -2.2     10.6  average average
## 248      1.56      -7.9      1.3      7.6  average  low
## 249      0.88     -22.5      0.2      9.5    high  high
## 172      0.63      -7.2      1.4     10.2  very high  low
## 195      0.96     -11.8      1.2      8.4    low  low
## 159      0.94     -16.0      1.8     14.1  average average
##      BestQuarter WorstQuarter
```

```
## 77      30.2      -25.6
## 116     28.0      -20.5
## 143     17.5      -17.5
## 127     19.8      -11.5
## 176     28.4      -25.8
## 158     21.1      -17.3
## 25      25.3      -20.3
## 224     32.1      -17.5
## 236     12.6      -13.0
## 39      23.6      -19.3
## 248     13.5      -13.6
## 249     40.2      -19.1
## 172     20.8      -13.4
## 195     13.3      -13.5
## 159     28.5      -25.6
```

##Question 1.2.

```
mid_cap = data[data$Type == "mid cap",]
mid_cap
```

```
##           Fund      Type Objective Assets Fees
## 2           Pioneer Value A mid cap      Value 4189.6 Yes
## 4           Mairs and Power Growth mid cap      Value 656.3 No
## 6           Franklin California Growth A mid cap      Growth 1433.5 Yes
## 12          Fidelity Advisor Mid Cap T mid cap      Growth 1404.2 No
## 26          One Group Mid Cap Growth I mid cap      Growth 1358.9 No
## 27          Columbia Special mid cap      Growth 775.9 No
## 28          Amer. Century Heritage Inv. mid cap      Growth 1250.0 No
## 54          Van Kampen Emerging Growth A mid cap      Growth 6005.3 Yes
## 57          PBHG Growth mid cap      Growth 2504.0 No
## 58          T. Rowe Price Value mid cap      Value 1277.9 No
## 60          PIMCO Target C mid cap      Growth 927.8 No
## 65          Credit Suisse Emerging Growth Cmn. mid cap      Growth 950.1 No
## 76          Franklin Small Mid Cap Growth A mid cap      Growth 8117.9 Yes
## 81          Lord Abbett Mid Cap Value A mid cap      Value 1148.4 Yes
## 82          Federated Growth Strategies A mid cap      Growth 708.2 Yes
## 89          MFS Mid Cap Growth mid cap      Growth 1164.0 Yes
## 109         One Group Mid Cap Value I mid cap      Value 1145.8 No
## 110         Gabelli Value A mid cap      Value 1216.7 Yes
## 114         Waddell & Reed Adv New Concepts A mid cap      Growth 1164.0 Yes
## 118         MS Mid Cap Equity Tr. B mid cap      Growth 705.6 No
## 121         Putnam Vista A mid cap      Growth 4043.4 Yes
## 122         Pioneer Mid Cap Value A mid cap      Value 975.0 Yes
## 124         Vanguard PrimeCap mid cap      Growth 17885.0 No
## 125         T. Rowe Price Mid Cap Growth mid cap      Growth 6354.0 No
## 131         Mutual Beacon Z mid cap      Value 3046.7 No
## 132         Vanguard Selected Value mid cap      Value 954.8 No
## 146         AXP Equity Select A mid cap      Growth 1240.9 Yes
## 147         AXP Strategy Aggressive A mid cap      Growth 1014.3 Yes
## 149         Clipper mid cap      Value 2468.0 No
## 162         RS Emerging Growth A mid cap      Growth 2461.1 No
## 163         Pioneer Mid Cap Growth A mid cap      Growth 676.8 Yes
## 164         Neuberger Berman Focus Inv mid cap      Growth 1565.1 No
## 165 Dreyfus Growth & Value Midcap Value mid cap      Value 1210.5 No
```

## 170	Fidelity Advisor Value Strategies T mid cap	Value	667.4	Yes
## 177	Janus Enterprise mid cap	Growth	3227.1	No
## 182	Strong Advisor Common Stock Z mid cap	Value	1624.7	No
## 184	Fidelity Value mid cap	Value	4956.8	No
## 189	Mutual Shares Z mid cap	Value	5371.3	No
## 192	Invesco Dynamics Inv mid cap	Growth	5900.6	No
## 199	Fidelity Mid Cap Stock mid cap	Growth	6272.7	No
## 207	Turner Mid Cap Growth mid cap	Growth	727.4	No
## 240	Ariel Appreciation mid cap	Value	707.3	No
## 242	PIMCO Renaissance C mid cap	Value	854.9	No
## 251	MS Instl Mid Cap Growth Instl mid cap	Growth	1213.6	No
## 254	Fortis Growth A mid cap	Growth	649.7	Yes
## 255	Janus Core Equity mid cap	Growth	788.7	No
##	ExpenseRatio Return2001 R3Yr.Return R5.Yr.Return Turnover Risk			
## 2	0.94 -3.1 4.5 5.4	very low	average	
## 4	0.78 6.5 13.0 15.2	very low	low	
## 6	0.88 -23.2 11.7 12.3	very low	high	
## 12	1.31 -13.2 16.4 18.1	high	average	
## 26	0.99 -10.7 6.9 16.9	average	high	
## 27	0.99 -21.0 7.0 10.0	high	high	
## 28	1.00 -25.6 9.7 9.5	average	average	
## 54	0.93 -32.6 6.8 14.8	high	high	
## 57	1.25 -34.5 -1.0 -1.2	average	very high	
## 58	1.10 1.6 8.7 12.1	average	low	
## 60	1.95 -29.2 8.5 12.7	average	high	
## 65	1.19 -24.8 -2.1 3.8	high	high	
## 76	0.86 -20.5 12.2 10.3	very low	high	
## 81	1.35 8.0 19.9 17.7	average	low	
## 82	1.20 -22.6 2.1 9.5	average	high	
## 89	1.26 -19.9 15.5 15.7	average	high	
## 109	0.96 5.0 10.4 14.0	high	low	
## 110	1.36 5.4 8.6 18.5	average	low	
## 114	1.44 -18.1 4.4 13.0	very low	high	
## 118	1.58 -39.4 -4.3 9.6	very low	very high	
## 121	0.89 -33.6 -0.8 7.5	average	high	
## 122	1.11 5.6 11.8 9.4	average	low	
## 124	0.48 -13.3 8.6 17.0	very low	average	
## 125	0.85 -1.0 9.6 13.7	low	average	
## 131	0.81 6.1 12.3 12.3	average	very low	
## 132	0.63 15.1 9.9 6.6	low	average	
## 146	0.95 -12.7 3.2 11.3	average	high	
## 147	1.10 -32.9 -1.8 5.5	average	very high	
## 149	1.09 10.3 14.1 18.2	low	very low	
## 162	1.29 -27.3 15.5 18.5	high	very high	
## 163	0.85 -11.4 3.0 5.1	low	high	
## 164	0.83 -6.7 9.8 13.2	low	high	
## 165	1.15 17.1 24.1 18.6	very high	average	
## 170	1.14 12.1 14.0 13.5	low	average	
## 177	0.88 -39.9 -2.5 6.5	low	very high	
## 182	1.20 -1.7 10.9 12.5	average	average	
## 184	0.77 12.2 9.6 9.8	low	average	
## 189	0.78 6.3 11.7 12.1	average	very low	
## 192	1.00 -32.9 2.1 10.2	low	high	
## 199	0.84 -12.8 17.2 18.7	high	average	

## 207	1.04	-28.4	14.1	21.4	very high	high
## 240	1.26	16.2	9.9	17.0	low	low
## 242	2.00	18.5	20.9	21.4	high	low
## 251	0.61	-29.6	3.1	14.9	average	high
## 254	1.04	-24.1	6.5	10.3	high	high
## 255	0.93	-12.1	4.2	15.8	high	low
##	BestQuarter	WorstQuarter				
## 2	15.5	-22.3				
## 4	19.0	-13.2				
## 6	56.4	-26.0				
## 12	28.3	-21.9				
## 26	39.9	-21.0				
## 27	37.4	-20.3				
## 28	40.4	-21.2				
## 54	61.3	-25.3				
## 57	64.6	-32.6				
## 58	15.0	-13.4				
## 60	52.7	-27.2				
## 65	39.3	-27.8				
## 76	59.8	-25.1				
## 81	17.6	-17.3				
## 82	42.0	-20.9				
## 89	39.9	-33.0				
## 109	16.0	-13.6				
## 110	21.3	-14.6				
## 114	46.2	-21.5				
## 118	62.2	-40.4				
## 121	42.1	-32.2				
## 122	13.9	-21.4				
## 124	28.8	-21.7				
## 125	26.8	-17.7				
## 131	12.6	-17.5				
## 132	17.5	-27.2				
## 146	31.4	-19.4				
## 147	55.0	-28.8				
## 149	16.2	-4.3				
## 162	75.2	-31.3				
## 163	32.2	-23.0				
## 164	34.5	-29.2				
## 165	29.5	-27.7				
## 170	30.1	-28.7				
## 177	57.9	-32.7				
## 182	25.3	-20.1				
## 184	25.6	-20.1				
## 189	13.3	-17.0				
## 192	38.8	-35.0				
## 199	28.5	-24.7				
## 207	54.6	-32.3				
## 240	23.4	-12.9				
## 242	21.0	-16.8				
## 251	39.2	-27.6				
## 254	43.9	-23.9				
## 255	26.6	-14.5				

```
set.seed(2340)
sample_numbers_m = sample(1:nrow(mid_cap), 15, replace = FALSE)
sort(sample_numbers_m)
```

```
## [1] 3 4 6 11 14 19 29 31 32 33 36 37 38 40 45
```

```
m_sample = mid_cap[sample_numbers_m,]
m_sample
```

```
##           Fund      Type Objective Assets Fees
## 60          PIMCO Target C mid cap    Growth  927.8   No
## 254         Fortis Growth A mid cap    Growth  649.7  Yes
## 164      Neuberger Berman Focus Inv mid cap    Growth 1565.1   No
## 27          Columbia Special mid cap    Growth  775.9   No
## 149         Clipper mid cap          Value 2468.0   No
## 189         Mutual Shares Z mid cap          Value 5371.3   No
## 165 Dreyfus Growth & Value Midcap Value mid cap    Value 1210.5   No
## 182      Strong Advisor Common Stock Z mid cap    Value 1624.7   No
## 12          Fidelity Advisor Mid Cap T mid cap    Growth 1404.2   No
## 199         Fidelity Mid Cap Stock mid cap    Growth 6272.7   No
## 114 Waddell & Reed Adv New Concepts A mid cap    Growth 1164.0  Yes
## 81          Lord Abnett Mid Cap Value A mid cap    Value 1148.4  Yes
## 184         Fidelity Value mid cap          Value 4956.8   No
## 6          Franklin California Growth A mid cap    Growth 1433.5  Yes
## 163        Pioneer Mid Cap Growth A mid cap    Growth  676.8  Yes
## ExpenseRatio Return2001 R3Yr.Return R5.Yr.Return Turnover Risk
## 60          1.95      -29.2         8.5         12.7  average  high
## 254          1.04      -24.1         6.5         10.3   high  high
## 164          0.83       -6.7         9.8         13.2   low  high
## 27           0.99      -21.0         7.0         10.0   high  high
## 149          1.09       10.3        14.1         18.2   low very low
## 189          0.78        6.3        11.7         12.1  average very low
## 165          1.15       17.1        24.1         18.6 very high  average
## 182          1.20       -1.7        10.9         12.5  average  average
## 12           1.31      -13.2        16.4         18.1   high  average
## 199          0.84      -12.8        17.2         18.7   high  average
## 114          1.44      -18.1         4.4         13.0 very low   high
## 81           1.35        8.0        19.9         17.7  average   low
## 184          0.77       12.2         9.6          9.8    low  average
## 6            0.88      -23.2        11.7         12.3 very low   high
## 163          0.85      -11.4         3.0          5.1    low   high
## BestQuarter WorstQuarter
## 60          52.7      -27.2
## 254          43.9      -23.9
## 164          34.5      -29.2
## 27           37.4      -20.3
## 149          16.2       -4.3
## 189          13.3      -17.0
## 165          29.5      -27.7
## 182          25.3      -20.1
## 12           28.3      -21.9
## 199          28.5      -24.7
## 114          46.2      -21.5
## 81           17.6      -17.3
```

```
## 184      25.6      -20.1
## 6        56.4      -26.0
## 163      32.2      -23.0
```

##Question 1.3.

```
sml_cap = data[data$Type == "small cap ",]
sml_cap
```

##	Fund	Type	Objective	Assets	Fees	
## 5	Royce Low Priced Stock	small cap	Value	852.1	No	
## 20	Neuberger Berman Genesis Inv	small cap	Value	989.5	No	
## 30	Berger Small Company Growth Inv	small cap	Growth	717.9	No	
## 31	Amer. Century Vista Inv.	small cap	Growth	1239.8	No	
## 43	Federated Kaufmann K	small cap	Growth	3210.4	No	
## 51	Armada Small Cap value I	small cap	Value	638.1	No	
## 53	Delaware Trend A	small cap	Growth	732.6	Yes	
## 63	Consulting Group Small Cap Growth	small cap	Growth	696.4	No	
## 64	RS Diversified Growth A	small cap	Growth	713.6	No	
## 72	AIM Aggressive Growth A	small cap	Growth	2639.2	Yes	
## 79	T. Rowe Price Small Cap Value	small cap	Value	1870.5	No	
## 85	Amer. Century GiftTrust Inv.	small cap	Growth	921.1	No	
## 103	State Street Research Aurora	small cap	Value	1557.0	Yes	
## 105	Brazos Small Cap Y	small cap	Growth	850.8	No	
## 108	Baron Asset	small cap	Growth	2691.0	No	
## 115	Vanguard Explorer	small cap	Growth	4334.5	No	
## 129	Longleaf Partners Small Cap	small cap	Value	1618.5	No	
## 134	Safeco Growth Opportunities	small cap	Growth	683.6	No	
## 144	Dreyfus Founders Discovery F	small cap	Growth	802.1	No	
## 150	Heartland Value	small cap	Value	1006.4	No	
## 151	Fidelity Small Cap Indepence	small cap	Growth	855.8	No	
## 168	Fidelity Export & Multinational	small cap	Growth	630.8	No	
## 171	Van Kampen Aggressive Growth A	small cap	Growth	769.7	Yes	
## 179	Schwab Capital Small vap Index Inv	small cap	Growth	870.5	No	
## 181	Putnam OTC Emerging Growth A	small cap	Growth	1817.6	Yes	
## 183	Fremont U.S. Micro Cap	small cap	Growth	653.3	No	
## 185	Aim Small Cap Growth A	small cap	Growth	602.2	Yes	
## 188	Franklin Balance Sheet Invest. A	small cap	Value	1623.4	Yes	
## 190	Invesco Small Company Growth Inv	small cap	Growth	1245.3	No	
## 193	Meridian Value	small cap	Value	989.9	No	
## 196	Lord Abbett Developing Growth A	small cap	Growth	982.2	Yes	
## 203	Fidelity New Millenium	small cap	Growth	2828.4	Yes	
## 204	T. Rowe Price New Horizons	small cap	Growth	5234.7	No	
## 209	Merrill Lynch Master Small Cap Value B	small cap	Growth	841.7	No	
## 213	John Hancock Small Cap Growth A	small cap	Growth	712.2	Yes	
## 214	Liberty Acorn Z	small cap	Value	3992.0	No	
## 216	Fidelity Low Priced Stock	small cap	Value	11402.4	Yes	
## 220	Wasatch Small Cap Growth	small cap	Growth	796.2	No	
## 225	Janus Venture	small cap	Growth	1100.3	No	
## 231	Oppenheim Discovery A	small cap	Growth	825.3	Yes	
## 241	AXP Small Company Index A	small cap	Value	652.3	Yes	
## 252	Royce Premier	small cap	Value	748.8	No	
##	ExpenseRatio	Return2001	R3Yr.Return	R5.Yr.Return	Turnover	Risk
## 5	1.49	25.1	26.2	19.7	average	average
## 20	1.11	12.1	15.6	14.2	low	low



## 30	1.27	-33.8	7.5	8.3	average	very high
## 31	1.00	-27.6	16.2	4.2	average	high
## 43	1.88	7.9	14.6	11.3	low	average
## 51	1.20	17.3	19.1	15.8	high	low
## 53	1.34	-14.9	10.8	10.7	low	high
## 63	1.06	-13.3	2.8	4.3	low	very high
## 64	1.51	1.9	23.1	22.9	very high	high
## 72	1.04	-26.0	3.4	5.4	low	high
## 79	0.90	21.9	13.9	10.6	very low	low
## 85	1.00	-35.4	0.3	-2.8	average	very high
## 103	1.44	15.8	28.5	21.4	low	low
## 105	1.03	-9.0	9.5	18.2	average	average
## 108	1.36	-10.1	1.6	7.9	very low	high
## 115	0.71	0.5	14.7	12.3	average	high
## 129	0.98	5.4	7.4	12.5	low	low
## 134	1.05	22.2	6.3	13.4	low	high
## 144	1.25	-17.8	13.6	13.4	average	high
## 150	1.22	29.5	18.2	12.5	average	low
## 151	0.74	6.3	8.7	8.6	very high	average
## 168	0.81	0.7	13.2	17.0	high	average
## 171	1.19	-39.7	6.1	12.9	very high	very high
## 179	0.49	-0.9	8.5	9.1	low	average
## 181	1.04	-46.1	-15.9	-6.1	average	very high
## 183	1.57	5.3	29.3	18.9	average	high
## 185	1.13	-13.8	17.7	18.5	low	high
## 188	1.06	17.7	11.8	11.8	very low	low
## 190	1.29	-20.9	8.0	11.4	average	high
## 193	1.10	11.7	28.4	25.0	average	low
## 196	1.11	-7.0	1.9	8.4	low	high
## 203	0.89	-18.2	17.1	17.6	average	high
## 204	0.88	-2.8	8.1	8.1	low	high
## 209	2.06	29.3	25.0	17.8	average	average
## 213	1.28	-14.2	3.6	7.6	average	very high
## 214	0.83	6.1	15.9	15.6	low	low
## 216	1.00	26.7	16.5	15.1	average	very low
## 220	1.36	24.2	26.9	22.0	low	average
## 225	0.86	-11.9	4.8	9.8	average	very high
## 231	1.25	-11.6	5.1	4.6	average	high
## 241	0.87	5.4	9.0	9.3	average	average
## 252	1.20	9.6	12.7	12.6	low	low
##	BestQuarter	WorstQuarter				
## 5	27.7	-21.5				
## 20	20.1	-16.4				
## 30	59.0	-38.8				
## 31	72.2	-27.5				
## 43	35.6	-18.7				
## 51	19.3	-17.6				
## 53	35.0	-26.4				
## 63	36.1	-28.9				
## 64	62.9	-29.4				
## 72	31.4	-24.7				
## 79	16.7	-20.3				
## 85	56.3	-35.1				
## 103	22.7	-23.7				

```
## 105      29.9      -19.5
## 108      26.6      -23.5
## 115      30.0      -21.7
## 129      18.5      -18.4
## 134      34.5      -25.4
## 144      41.9      -27.9
## 150      21.7      -18.6
## 151      17.4      -24.5
## 168      28.4      -14.8
## 171      56.8      -29.1
## 179      19.6      -20.9
## 181      81.3      -43.2
## 183      49.7      -29.0
## 185      38.1      -24.4
## 188      17.6      -13.6
## 190      46.7      -28.7
## 193      25.0      -17.5
## 196      28.3      -22.5
## 203      53.7      -28.3
## 204      30.2      -25.2
## 209      28.1      -26.0
## 213      43.9      -26.5
## 214      21.9      -19.5
## 216      16.5      -16.8
## 220      32.0      -23.8
## 225      82.8      -30.2
## 231      59.4      -23.6
## 241      20.2      -21.1
## 252      21.0      -14.8
```

```
set.seed(2340)
sample_numbers_s = sample(1:nrow(sml_cap), 15, replace = FALSE)
sort(sample_numbers_s)
```

```
## [1] 1 4 5 6 7 11 14 19 21 29 32 33 36 37 38
```

```
s_sample = sml_cap[sample_numbers_s,]
s_sample
```

##	Fund	Type	Objective	Assets	Fees
## 79	T. Rowe Price Small Cap Value	small cap	Value	1870.5	No
## 203	Fidelity New Millenium	small cap	Growth	2828.4	Yes
## 51	Armada Small Cap value I	small cap	Value	638.1	No
## 190	Invesco Small Company Growth Inv	small cap	Growth	1245.3	No
## 220	Wasatch Small Cap Growth	small cap	Growth	796.2	No
## 204	T. Rowe Price New Horizons	small cap	Growth	5234.7	No
## 214	Liberty Acorn Z	small cap	Value	3992.0	No
## 31	Amer. Century Vista Inv.	small cap	Growth	1239.8	No
## 216	Fidelity Low Priced Stock	small cap	Value	11402.4	Yes
## 144	Dreyfus Founders Discovery F	small cap	Growth	802.1	No
## 43	Federated Kaufmann K	small cap	Growth	3210.4	No
## 151	Fidelity Small Cap Indepence	small cap	Growth	855.8	No
## 105	Brazos Small Cap Y	small cap	Growth	850.8	No
## 5	Royce Low Priced Stock	small cap	Value	852.1	No
## 53	Delaware Trend A	small cap	Growth	732.6	Yes

##	ExpenseRatio	Return2001	R3Yr.Return	R5.Yr.Return	Turnover	Risk
## 79	0.90	21.9	13.9	10.6	very low	low
## 203	0.89	-18.2	17.1	17.6	average	high
## 51	1.20	17.3	19.1	15.8	high	low
## 190	1.29	-20.9	8.0	11.4	average	high
## 220	1.36	24.2	26.9	22.0	low	average
## 204	0.88	-2.8	8.1	8.1	low	high
## 214	0.83	6.1	15.9	15.6	low	low
## 31	1.00	-27.6	16.2	4.2	average	high
## 216	1.00	26.7	16.5	15.1	average	very low
## 144	1.25	-17.8	13.6	13.4	average	high
## 43	1.88	7.9	14.6	11.3	low	average
## 151	0.74	6.3	8.7	8.6	very high	average
## 105	1.03	-9.0	9.5	18.2	average	average
## 5	1.49	25.1	26.2	19.7	average	average
## 53	1.34	-14.9	10.8	10.7	low	high

##	BestQuarter	WorstQuarter
## 79	16.7	-20.3
## 203	53.7	-28.3
## 51	19.3	-17.6
## 190	46.7	-28.7
## 220	32.0	-23.8
## 204	30.2	-25.2
## 214	21.9	-19.5
## 31	72.2	-27.5
## 216	16.5	-16.8
## 144	41.9	-27.9
## 43	35.6	-18.7
## 151	17.4	-24.5
## 105	29.9	-19.5
## 5	27.7	-21.5
## 53	35.0	-26.4

##Question 2.1.

```

N = as.integer(length(data$Type))
k1 = 7
set.seed(1326)
start1 = ceiling(runif(1,0,1)*k1)
start1

## [1] 1

sample1 = seq.int(from = start1, to = N, by = k1)
sample1

## [1] 1 8 15 22 29 36 43 50 57 64 71 78 85 92 99 106 113 120 127
## [20] 134 141 148 155 162 169 176 183 190 197 204 211 218 225 232 239 246 253

head(sample1)

## [1] 1 8 15 22 29 36

```

##Question 2.2.

```

n2 = 20
k2 = ceiling(N/n2)
set.seed(2547)

```

```

start2 = ceiling(runif(1,0,1)*k2)
start2

## [1] 12

sample2 = seq.int(from = start2, to = N, by = k2)
sample2

## [1] 12 25 38 51 64 77 90 103 116 129 142 155 168 181 194 207 220 233 246
## [20] 259

head(sample2)

## [1] 12 25 38 51 64 77

###Question 2.3.

n3 = ceiling(N*0.09)
k3 = ceiling(N/n3)
set.seed(2146)
start3 = ceiling(runif(1,0,1)*k3)
start3

## [1] 5

sample3 = seq.int(from = start3, to = N, by = k3)
sample3

## [1] 5 16 27 38 49 60 71 82 93 104 115 126 137 148 159 170 181 192 203
## [20] 214 225 236 247 258

head(sample3)

## [1] 5 16 27 38 49 60

###Question 2.4.

data_sample1 = data[sample1,]
data_sample1

```

```

##
## 1          Alger Large Cap Growth B large cap      Growth    614.0    No
## 8          Putnam Equity Income A large cap        Value    1247.9  Yes
## 15         ABN Amro Montag & Calswell Growth I large cap      Growth    1184.9  No
## 22          AIM Weingarten A large cap             Growth    4134.7  Yes
## 29          Dreyfus Premier Core Value A large cap      Value     678.0  Yes
## 36          Fidelity Large Cap Stock large cap       Growth     647.5  No
## 43          Federated Kaufmann K small cap          Growth    3210.4  No
## 50          Dreyfus Growth & Income large cap        Value    1123.8  No
## 57          PBHG Growth mid cap                    Growth    2504.0  No
## 64          RS Diversified Growth A small cap        Growth     713.6  No
## 71          Alliance Growth & Income B large cap      Value    3628.8  No
## 78          MS Value Added Market B large cap        Value    1019.4  No
## 85          Amer. Century GiftTrust Inv. small cap    Growth     921.1  No
## 92          Vanguard Equity Income large cap         Value    2242.0  No
## 99          Oppenheim Capital Appreciation A large cap      Growth    3240.0  Yes
## 106         Security Equity large cap               Growth     612.0  Yes
## 113         Salomon Brothers Investment Value large cap      Value     655.7  No
## 120         Massachusetts Investors Growth Stk A large cap    Growth    8398.2  Yes

```

## 127	State Farm Growth	large cap	Growth	2536.8	No	
## 134	Safeco Growth Opportunities	small cap	Growth	683.6	No	
## 141	Van Kampen Growth & Income A	large cap	Value	1702.5	Yes	
## 148	Fidelity Magellan	large cap	Growth	78790.2	Yes	
## 155	T. Rowe Price Growth Stock	large cap	Growth	4615.3	No	
## 162	RS Emerging Growth A	mid cap	Growth	2461.1	No	
## 169	Vanguard Windsor	large cap	Value	15798.6	No	
## 176	Janus	large cap	Growth	25757.0	No	
## 183	Fremont U.S. Micro Cap	small cap	Growth	653.3	No	
## 190	Invesco Small Company Growth Inv	small cap	Growth	1245.3	No	
## 197	Berger Growth	large cap	Growth	847.0	No	
## 204	T. Rowe Price New Horizons	small cap	Growth	5234.7	No	
## 211	Evergreen Omega B	large cap	Growth	863.4	No	
## 218	Janu Aspen Growth Instl	large cap	Growth	2446.9	No	
## 225	Janus Venture	small cap	Growth	1100.3	No	
## 232	Vanguard Value Inv	large cap	Value	3013.5	No	
## 239	PIMCO Growth C	large cap	Growth	1223.5	No	
## 246	Dreyfus Founders Growth F	large cap	Growth	905.3	No	
## 253	Smith Barney Large Cap Core	large cap	Growth	3382.7	Yes	
##	ExpenseRatio	Return2001	R3Yr.Return	R5.Yr.Return	Turnover	Risk
## 1	1.96	-12.9	-0.9	11.5	average	high
## 8	0.96	-1.6	4.0	9.9	average	low
## 15	0.77	-13.1	-0.2	11.7	low	average
## 22	1.03	-34.1	-10.9	3.5	high	high
## 29	1.15	-4.0	7.8	10.9	high	low
## 36	0.93	-17.7	-2.9	9.3	high	average
## 43	1.88	7.9	14.6	11.3	low	average
## 50	0.96	-6.1	1.8	6.6	average	average
## 57	1.25	-34.5	-1.0	-1.2	average	very high
## 64	1.51	1.9	23.1	22.9	very high	high
## 71	1.67	-2.5	6.6	13.3	average	low
## 78	1.59	-3.0	5.7	10.7	very low	low
## 85	1.00	-35.4	0.3	-2.8	average	very high
## 92	0.47	-2.3	3.4	11.2	low	low
## 99	1.03	-12.7	7.0	13.9	low	average
## 106	1.02	-11.8	-5.1	7.0	low	average
## 113	0.73	-4.2	7.3	12.5	average	low
## 120	0.85	-24.8	-1.1	15.0	very high	average
## 127	0.11	-10.8	0.1	9.6	very low	average
## 134	1.05	22.2	6.3	13.4	low	high
## 141	0.88	-6.1	8.0	13.2	high	low
## 148	0.88	-11.7	-0.2	11.0	low	average
## 155	0.73	-9.8	3.4	12.2	average	average
## 162	1.29	-27.3	15.5	18.5	high	very high
## 169	0.31	5.7	11.0	10.9	average	average
## 176	0.84	-26.1	-2.6	9.5	average	high
## 183	1.57	5.3	29.3	18.9	average	high
## 190	1.29	-20.9	8.0	11.4	average	high
## 197	1.13	-32.5	-5.9	1.9	average	high
## 204	0.88	-2.8	8.1	8.1	low	high
## 211	2.06	-16.2	0.9	9.9	high	high
## 218	0.67	-24.7	-2.5	9.0	low	average
## 225	0.86	-11.9	4.8	9.8	average	very high
## 232	0.22	-11.9	1.7	9.4	low	average

```
## 239      1.90      -29.6      -5.7      7.2  average      high
## 246      1.06      -24.9      -8.8      3.8    high      high
## 253      0.71      -14.8       1.3     11.3 very low  average
##      BestQuarter WorstQuarter
## 1          25.0       -18.4
## 8          13.9       -10.2
## 15         27.1       -15.5
## 22         28.0       -27.7
## 29         15.3       -14.6
## 36         23.5       -19.0
## 43         35.6       -18.7
## 50         18.5       -16.4
## 57         64.6       -32.6
## 64         62.9       -29.4
## 71         22.9       -14.1
## 78         16.5       -14.1
## 85         56.3       -35.1
## 92         13.2        -8.4
## 99         28.9       -19.9
## 106        20.9       -15.0
## 113        17.4       -12.8
## 120        28.2       -21.6
## 127        19.8       -11.5
## 134        34.5       -25.4
## 141        15.9       -11.5
## 148        27.2       -15.4
## 155        23.1       -15.0
## 162        75.2       -31.3
## 169        14.4       -19.4
## 176        28.4       -25.8
## 183        49.7       -29.0
## 190        46.7       -28.7
## 197        42.9       -28.0
## 204        30.2       -25.2
## 211        28.9       -25.7
## 218        27.7       -24.8
## 225        82.8       -30.2
## 232        17.5       -16.3
## 239        38.2       -23.7
## 246        31.8       -25.0
## 253        23.6       -15.2
```

```
mean_data_sample_1 = mean(data_sample1$Assets)
mean_data_sample_1
```

```
## [1] 5136.135
```

```
data_sample2 = data[sample2,]
data_sample2
```

```
##           Fund      Type Objective Assets Fees
## 12  Fidelity Advisor Mid Cap T   mid cap   Growth 1404.2  No
## 25           Putnam Investors A large cap   Growth 5073.3  Yes
## 38      Northern Growth Equity large cap   Growth  873.7  No
## 51      Armada Small Cap value I small cap   Value  638.1  No
```

## 64	RS Diversified Growth A	small cap	Growth	713.6	No	
## 77	Oppenheim Growth A	large cap	Growth	1547.5	Yes	
## 90	Delaware Decatur Equity Income A	large cap	Value	1132.5	Yes	
## 103	State Street Research Aurora	small cap	Value	1557.0	Yes	
## 116	Excelsior Value & Restructuring	large cap	Value	2124.2	No	
## 129	Longleaf Partners Small Cap	small cap	Value	1618.5	No	
## 142	Fidelity Advisor Growth Opportunities T	large cap	Value	8152.0	Yes	
## 155	T. Rowe Price Growth Stock	large cap	Growth	4615.3	No	
## 168	Fidelity Export & Multinational	small cap	Growth	630.8	No	
## 181	Putnam OTC Emerging Growth A	small cap	Growth	1817.6	Yes	
## 194	Fidelity Blue Chip Growth	large cap	Growth	21859.4	No	
## 207	Turner Mid Cap Growth	mid cap	Growth	727.4	No	
## 220	Wasatch Small Cap Growth	small cap	Growth	796.2	No	
## 233	Gabelli Growth	large cap	Growth	2998.9	No	
## 246	Dreyfus Founders Growth F	large cap	Growth	905.3	No	
## 259	Rydex OTC Inv	large cap	Growth	1001.7	No	
##	ExpenseRatio	Return2001	R3Yr.Return	R5.Yr.Return	Turnover	Risk
## 12	1.31	-13.2	16.4	18.1	high	average
## 25	0.89	-24.8	-7.3	7.8	average	high
## 38	1.00	-16.7	-1.5	10.7	average	average
## 51	1.20	17.3	19.1	15.8	high	low
## 64	1.51	1.9	23.1	22.9	very high	high
## 77	1.06	-24.5	-0.5	5.2	average	high
## 90	1.12	-3.7	0.7	7.9	average	low
## 103	1.44	15.8	28.5	21.4	low	low
## 116	0.95	-5.0	13.1	16.3	low	average
## 129	0.98	5.4	7.4	12.5	low	low
## 142	1.03	-15.1	-10.3	2.8	high	average
## 155	0.73	-9.8	3.4	12.2	average	average
## 168	0.81	0.7	13.2	17.0	high	average
## 181	1.04	-46.1	-15.9	-6.1	average	very high
## 194	0.87	-16.6	-2.5	9.7	low	average
## 207	1.04	-28.4	14.1	21.4	very high	high
## 220	1.36	24.2	26.9	22.0	low	average
## 233	1.38	-24.1	-0.2	12.9	average	average
## 246	1.06	-24.9	-8.8	3.8	high	high
## 259	1.16	-34.7	-6.6	13.1	very high	very high
##	BestQuarter	WorstQuarter				
## 12	28.3	-21.9				
## 25	25.3	-20.3				
## 38	24.8	-15.8				
## 51	19.3	-17.6				
## 64	62.9	-29.4				
## 77	30.2	-25.6				
## 90	13.8	-10.5				
## 103	22.7	-23.7				
## 116	28.0	-20.5				
## 129	18.5	-18.4				
## 142	20.5	-16.6				
## 155	23.1	-15.0				
## 168	28.4	-14.8				
## 181	81.3	-43.2				
## 194	23.4	-18.4				
## 207	54.6	-32.3				

```
## 220      32.0      -23.8
## 233      30.2      -22.3
## 246      31.8      -25.0
## 259      53.0      -36.8
```

```
mean_data_sample_2 = mean(data_sample2$Assets)
mean_data_sample_2
```

```
## [1] 3009.36
```

```
data_sample3 = data[sample3,]
data_sample3
```

```
##              Fund      Type Objective  Assets Fees
## 5      Royce Low Priced Stock small cap      Value    852.1   No
## 16             Ameristock large cap      Value   1127.6   No
## 27      Columbia Special   mid cap      Growth    775.9   No
## 38      Northern Growth Equity large cap      Growth    873.7   No
## 49      Scudder Growth A large cap      Growth   1373.2   Yes
## 60      PIMCO Target C   mid cap      Growth    927.8   No
## 71      Alliance Growth & Income B large cap      Value   3628.8   No
## 82      Federated Growth Strategies A   mid cap      Growth    708.2   Yes
## 93      Amer. Century Equity Growth Inv. large cap      Growth   1481.2   No
## 104      Van Kampen Pace A large cap      Growth   2253.7   Yes
## 115      Vanguard Explorer small cap      Growth   4334.5   No
## 126      Fidelity OTC large cap      Growth   8087.4   No
## 137      Mutual Qualified Z large cap      Value   2956.9   No
## 148      Fidelity Magellan large cap      Growth  78790.2   Yes
## 159      Janus Special Situations large cap      Growth   1024.6   No
## 170 Fidelity Advisor Value Strategies T   mid cap      Value    667.4   Yes
## 181      Putnam OTC Emerging Growth A small cap      Growth   1817.6   Yes
## 192      Invesco Dynamics Inv   mid cap      Growth   5900.6   No
## 203      Fidelity New Millenium small cap      Growth   2828.4   Yes
## 214      Liberty Acorn Z small cap      Value   3992.0   No
## 225      Janus Venture small cap      Growth   1100.3   No
## 236      Oppenheim Quest Opp. Value A large cap      Value  12324.2   Yes
## 247      Enterprise Growth A large cap      Growth    809.8   Yes
## 258      Alliance Growth B large cap      Growth  2434.1   No
## ExpenseRatio Return2001 R3Yr.Return R5.Yr.Return Turnover Risk
## 5      1.49      25.1      26.2      19.7      average      average
## 16      0.83      2.3      8.2      17.1      very low      low
## 27      0.99     -21.0      7.0      10.0      high      high
## 38      1.00     -16.7     -1.5      10.7      average      average
## 49      1.02     -23.0     -5.4      2.5      average      high
## 60      1.95     -29.2      8.5      12.7      average      high
## 71      1.67     -2.5      6.6      13.3      average      low
## 82      1.20     -22.6      2.1      9.5      average      high
## 93      0.67     -11.0     -2.1      9.9      average      average
## 104     0.87     -16.2     -5.8      5.8      high      average
## 115     0.71      0.5      14.7      12.3      average      high
## 126     0.94     -24.1     -1.4      8.1      very high      high
## 137     0.80      8.2      12.0      12.0      average      very low
## 148     0.88     -11.7     -0.2      11.0      low      average
## 159     0.94     -16.0      1.8      14.1      average      average
## 170     1.14     12.1      14.0      13.5      low      average
```



```
## 181      1.04      -46.1      -15.9      -6.1 average very high
## 192      1.00      -32.9       2.1      10.2      low      high
## 203      0.89      -18.2      17.1      17.6 average      high
## 214      0.83       6.1      15.9      15.6      low      low
## 225      0.86     -11.9       4.8       9.8 average very high
## 236      1.53      -4.6       4.6       8.2 average      low
## 247      1.41     -13.4      -0.9      10.9 average average
## 258      1.97     -25.1      -8.9       4.0 average      high
##      BestQuarter WorstQuarter
## 5          27.7      -21.5
## 16         18.3      -10.1
## 27         37.4      -20.3
## 38         24.8      -15.8
## 49         29.1      -22.2
## 60         52.7      -27.2
## 71         22.9      -14.1
## 82         42.0      -20.9
## 93         23.1      -15.4
## 104        20.5      -16.5
## 115        30.0      -21.7
## 126        46.2      -32.0
## 137        13.4      -17.7
## 148        27.2      -15.4
## 159        28.5      -25.6
## 170        30.1      -28.7
## 181        81.3      -43.2
## 192        38.8      -35.0
## 203        53.7      -28.3
## 214        21.9      -19.5
## 225        82.8      -30.2
## 236        12.6      -13.0
## 247        26.8      -15.6
## 258        28.6      -23.8
```

```
mean_data_sample_3 = mean(data_sample3$Assets)
mean_data_sample_3
```

```
## [1] 5877.925
```

```
##Question 3
```

```
invoices = read.csv("C:/Users/Gerett/Documents/University/2nd Year/Stats 244/Chapter 1/Data Sets/INVOIC
invoices
```

```
##      InvoiceNumber InvoiceAmount
## 1              1           47
## 2              2          104
## 3              3           45
## 4              4          200
## 5              5          328
## 6              6           41
## 7              7           39
## 8              8          170
## 9              9          273
## 10             10          103
## 11             11           19
```

```

## 12      12      60
## 13      13     190
## 14      14      37
## 15      15      10
## 16      16      38
## 17      17      65
## 18      18      37
## 19      19      93
## 20      20      10
## 21      21      38
## 22      22     100
## 23      23      23
## 24      24     100
## 25      25      95
## 26      26     102
## 27      27      33
## 28      28     193
## 29      29      83
## 30      30      60

inv_num = (invoices$InvoiceNumber)
inv_num

## [1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
## [26] 26 27 28 29 30

inv_amount = (invoices$InvoiceAmount)
inv_amount

## [1] 47 104 45 200 328 41 39 170 273 103 19 60 190 37 10 38 65 37 93
## [20] 10 38 100 23 100 95 102 33 193 83 60

set.seed(5421)
probsize = inv_amount/sum(inv_amount)
probsize

## [1] 0.017178363 0.038011696 0.016447368 0.073099415 0.119883041 0.014985380
## [7] 0.014254386 0.062134503 0.099780702 0.037646199 0.006944444 0.021929825
## [13] 0.069444444 0.013523392 0.003654971 0.013888889 0.023757310 0.013523392
## [19] 0.033991228 0.003654971 0.013888889 0.036549708 0.008406433 0.036549708
## [25] 0.034722222 0.037280702 0.012061404 0.070540936 0.030336257 0.021929825

inv_sample = sample(inv_num, 7, replace = FALSE, prob = probsize)
inv_sample

## [1] 9 30 12 28 5 17 25

chosen_invoices = invoices[inv_sample,]
chosen_invoices

##      InvoiceNumber InvoiceAmount
## 9                9         273
## 30               30          60
## 12               12          60
## 28               28         193
## 5                5         328
## 17               17          65
## 25               25          95

```

##Question 4

```
stocks = read.table("C:/Users/Gerett/Documents/University/2nd Year/Stats 244/Chapter 1/Data Sets/STOCKS")
head(stocks)
```

```
##      Price
## 1  33.98
## 2  18.74
## 3  93.03
## 4  16.13
## 5 903.62
## 6  56.68
```

```
set.seed(125468)
mean = mean(stocks$Price)
mean
```

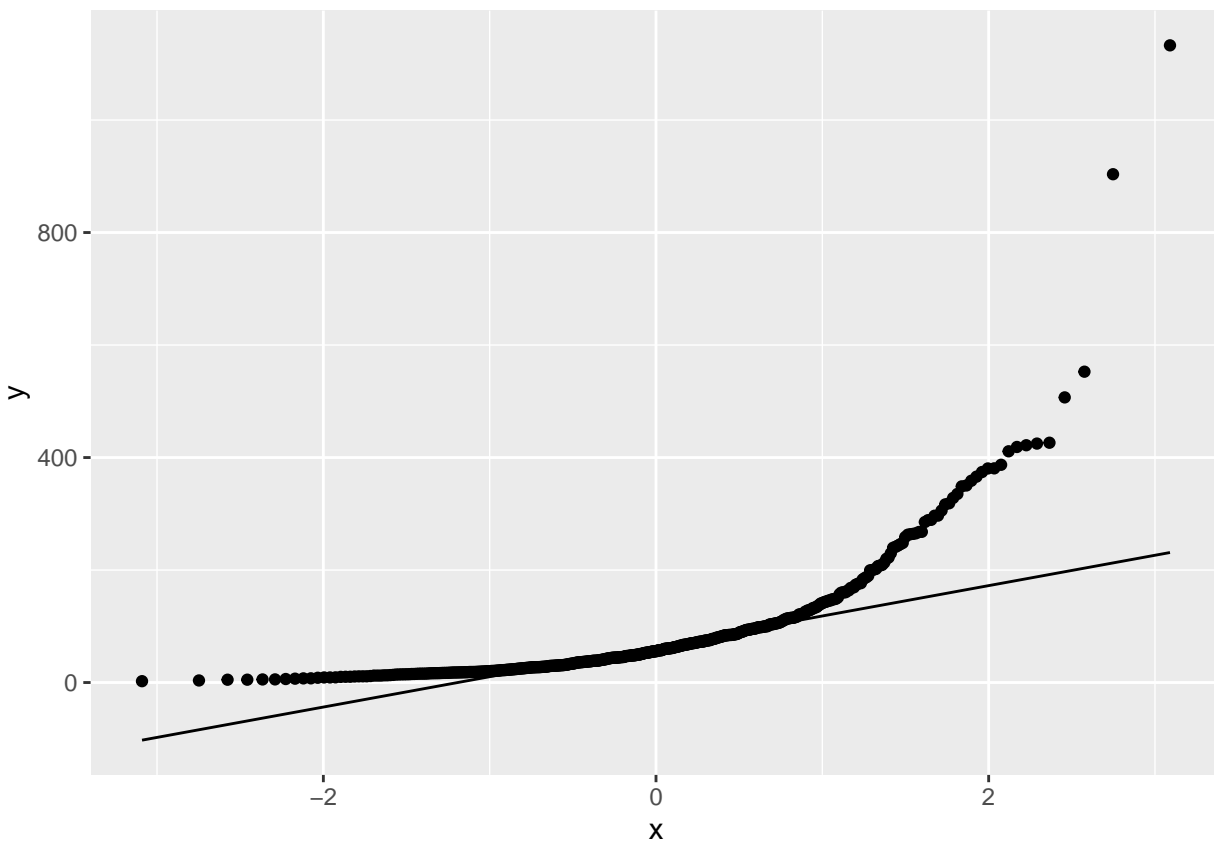
```
## [1] 87.47284
```

```
variance = var(stocks$Price)
variance
```

```
## [1] 10942.08
```

```
alpha = 3
beta = 1.1
```

```
ggplot (stocks, aes (sample = Price)) +
geom_qq(distribution = qnorm) +
geom_qq_line (distribution = qnorm)
```



```
ggplot (stocks, aes (sample = Price)) +  
geom_qq(distribution = qlnorm) +  
geom_qq_line (distribution = qlnorm)
```

