In [2]:
```
using CSV
input="plik.csv"
mydata=CSV.read(input, delim=",")
```

Out[2]: 110 rows × 3 columns

	rozmiar	czas	rodzaj
	Int64	Float64	String
1	5000000	0.1	V
2	5000000	0.1	V
3	5000000	0.1	V
4	5000000	0.1	V
5	5000000	0.09	V
6	5000000	0.1	V
7	5000000	0.09	V
8	5000000	0.1	V
9	5000000	0.09	V
10	5000000	0.09	V
11	5000000	0.09	V
12	5000000	0.11	V
13	5000000	0.09	V
14	5000000	0.1	V
15	5000000	0.1	V
16	5000000	0.1	V
17	5000000	0.09	V
18	5000000	0.09	V
19	5000000	0.1	V
20	5000000	0.1	V
21	6000000	0.12	V
22	6000000	0.11	V
23	6000000	0.11	V
24	6000000	0.12	V
25	6000000	0.12	V
26	6000000	0.11	V
27	6000000	0.11	V
28	6000000	0.12	V
29	6000000	0.11	V
30	6000000	0.11	V
⋮	⋮	⋮	⋮

In [13]:
```
typeof(mydata)
```

Out[13]:
```
DataFrame
```

In [14]:
```
size(mydata)
```

Out[14]:
```
(110, 3)
```

In [3]:
```
using DataFrames
using Statistics
using Plots
mean_grouped=by(mydata,[:rozmiar,:rodzaj],df->mean(df[!,2]))
```

Out[3]: 10 rows × 3 columns

	rozmiar	rodzaj	x1
	Int64	String	Float64
1	5000000	V	0.0965
2	6000000	V	0.114
3	7000000	V	0.133
4	8000000	V	0.148
5	9000000	V	0.166
6	1000	M	0.006
7	2000	M	0.028
8	3000	M	0.066
9	4000	M	0.132
10	5000	M	0.198

In [7]:
```
std_grouped=by(mydata,[:rozmiar,:rodzaj],df->std(df[!,2]))
```

Out[7]: 10 rows × 3 columns

	rozmiar	rodzaj	x1
	Int64	String	Float64
1	5000000	V	0.00587143
2	6000000	V	0.00516398
3	7000000	V	0.00483046
4	8000000	V	0.00788811
5	9000000	V	0.00699206
6	1000	M	0.00516398
7	2000	M	0.00421637
8	3000	M	0.00516398
9	4000	M	0.00421637
10	5000	M	0.00632456

In [5]:
```
mean_grouped_V = first(mean_grouped,5)
```

Out[5]: 5 rows × 3 columns

	rozmiar	rodzaj	x1
	Int64	String	Float64
1	5000000	V	0.0965
2	6000000	V	0.114
3	7000000	V	0.133
4	8000000	V	0.148
5	9000000	V	0.166

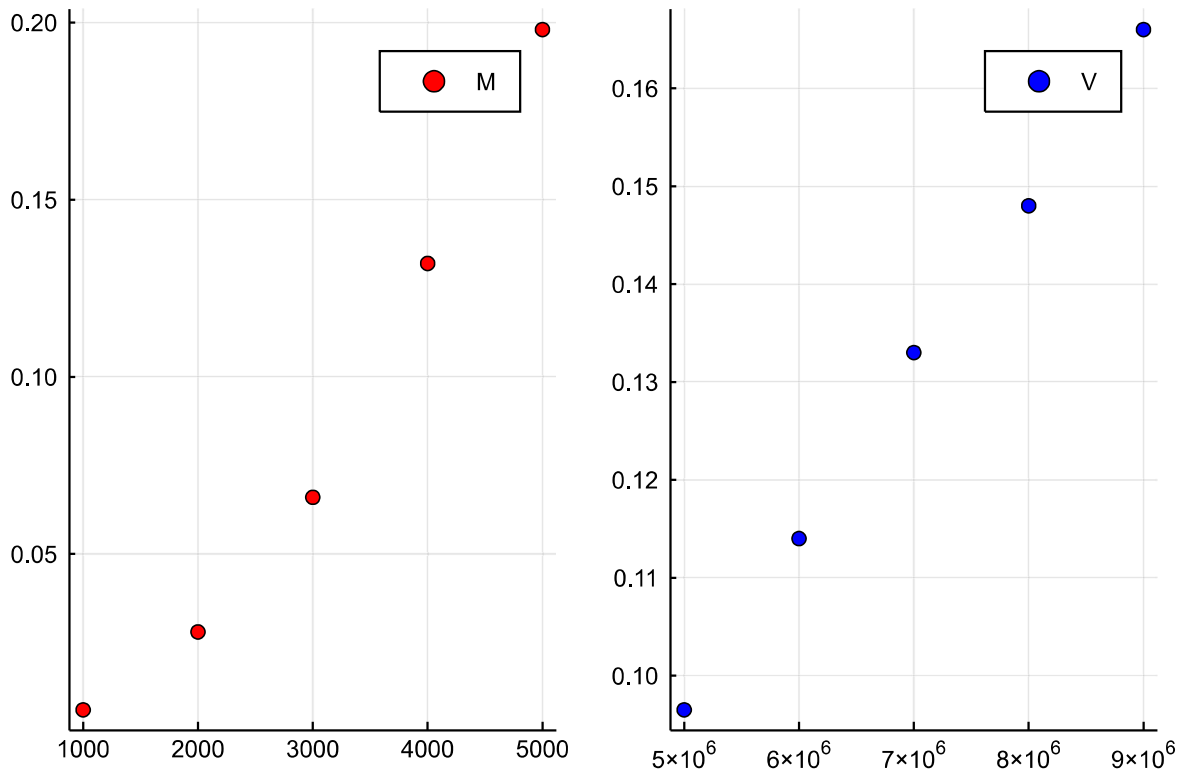
In [8]:
```
mean_grouped_M = last(mean_grouped,5)
```

Out[8]: 5 rows × 3 columns

	rozmiar	rodzaj	x1
	Int64	String	Float64
1	1000	M	0.006
2	2000	M	0.028
3	3000	M	0.066
4	4000	M	0.132
5	5000	M	0.198

In [9]:
```
scatter(mean_grouped[!,1], mean_grouped[!,3], group=mean_grouped[!,2], colour = |
```

Out[9]:



In [10]:
```
std_grouped_V = first(std_grouped,5)
```

Out[10]: 5 rows × 3 columns

	rozmiar	rodzaj	x1
	Int64	String	Float64
1	5000000	V	0.00587143
2	6000000	V	0.00516398
3	7000000	V	0.00483046
4	8000000	V	0.00788811
5	9000000	V	0.00699206

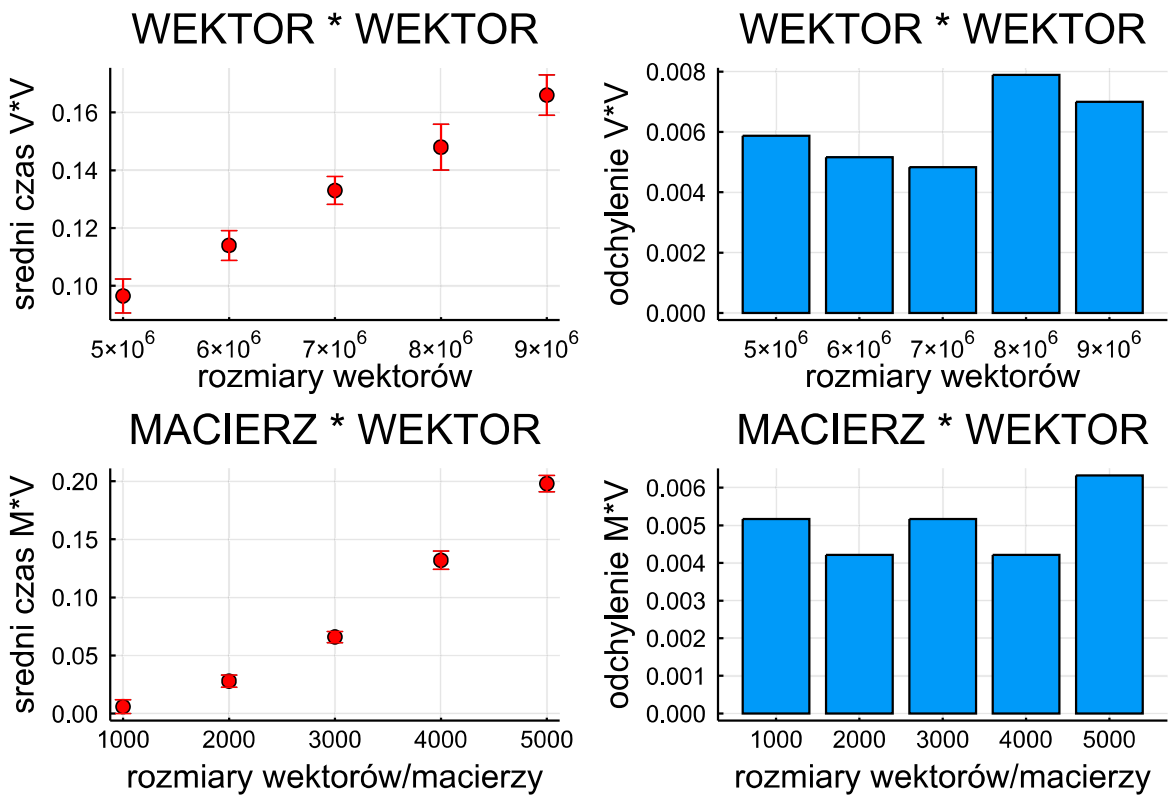
In [11]:
```
std_grouped_M = last(std_grouped,5)
```

Out[11]: 5 rows × 3 columns

	rozmiar	rodzaj	x1
	Int64	String	Float64
1	1000	M	0.00516398
2	2000	M	0.00421637
3	3000	M	0.00516398
4	4000	M	0.00421637
5	5000	M	0.00632456

In [12]:
```
using Plots
p1 = scatter(mean_grouped_V.rozmiar,mean_grouped_V.x1, ylabel = "sredni czas V*V'
p2 = bar(std_grouped_V.rozmiar,std_grouped_V.x1, ylabel = "odchylenie V*V", xlabe
p3 = scatter(mean_grouped_M.rozmiar,mean_grouped_M.x1,ylabel = "sredni czas M*V",
p4 = bar(std_grouped_M.rozmiar,std_grouped_M.x1, ylabel = "odchylenie M*V", xlabe
plot(p1, p2, p3,p4,layout = 4, legend = false)
```

Out[12]:



In [ ]:
```
```