In [21]:

```
#Name :- Kuldeep Ghorpade
#Div:- B
#Roll No :- 09
#Experiment NO :- 04
```

In [22]:

```
import Pkg
```

In [23]:

```
Pkg.add("Plots")
```
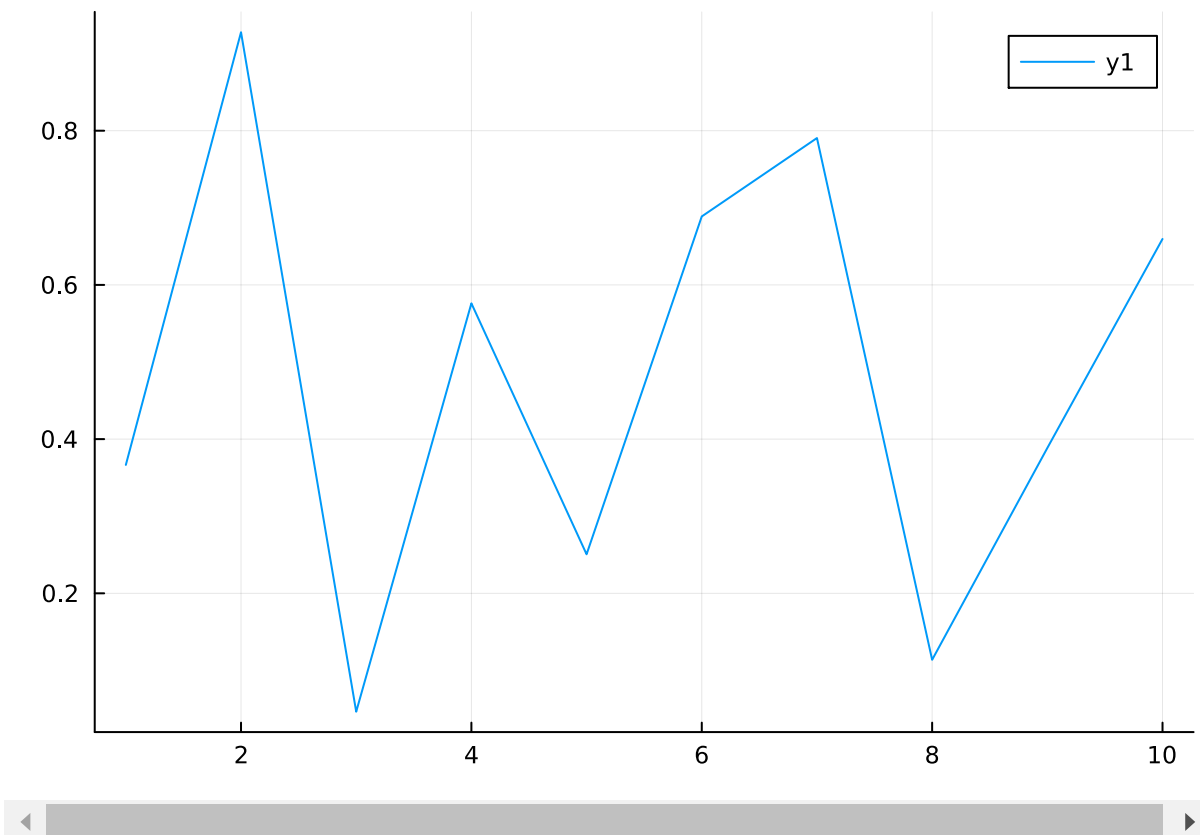
```
  Resolving package versions...
 No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Project.toml`
 No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Manifest.toml`
```

In [24]:
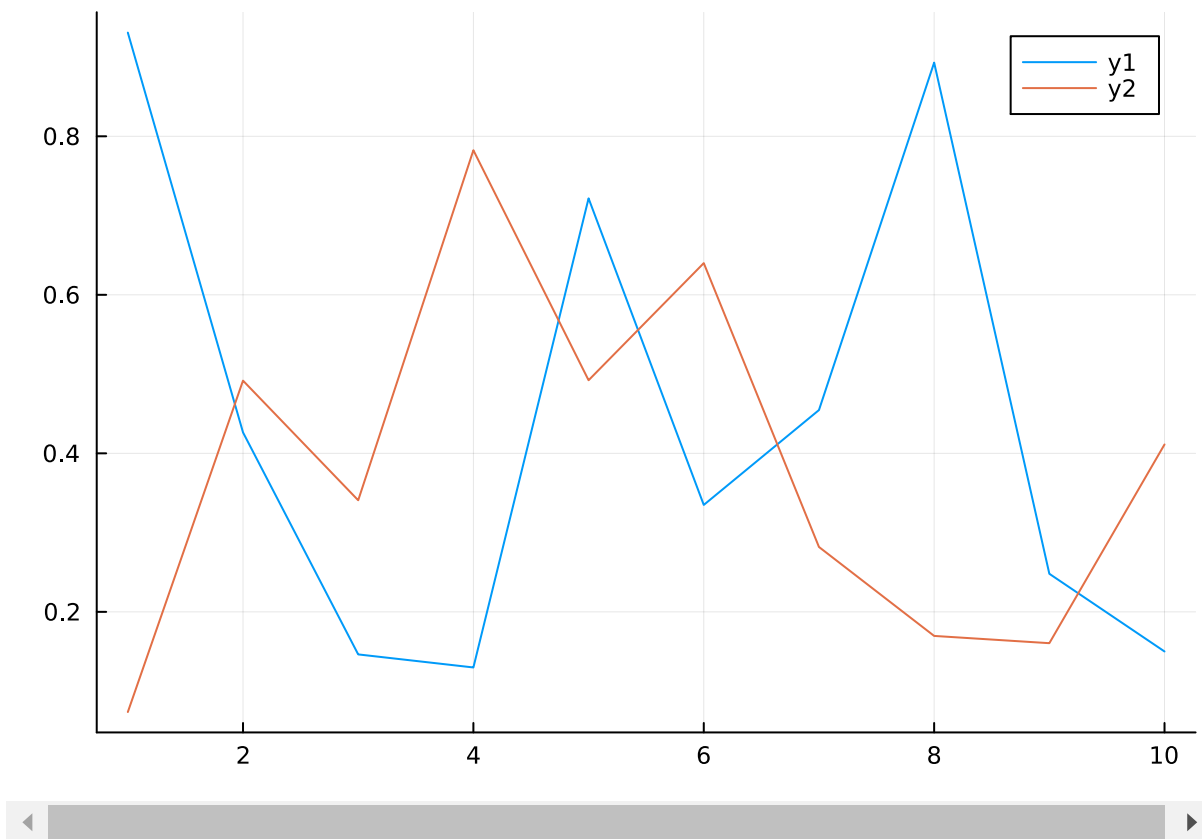
```
using Plots
x = 1:10; y = rand(10);
plot(x, y)
```

Out[24]:

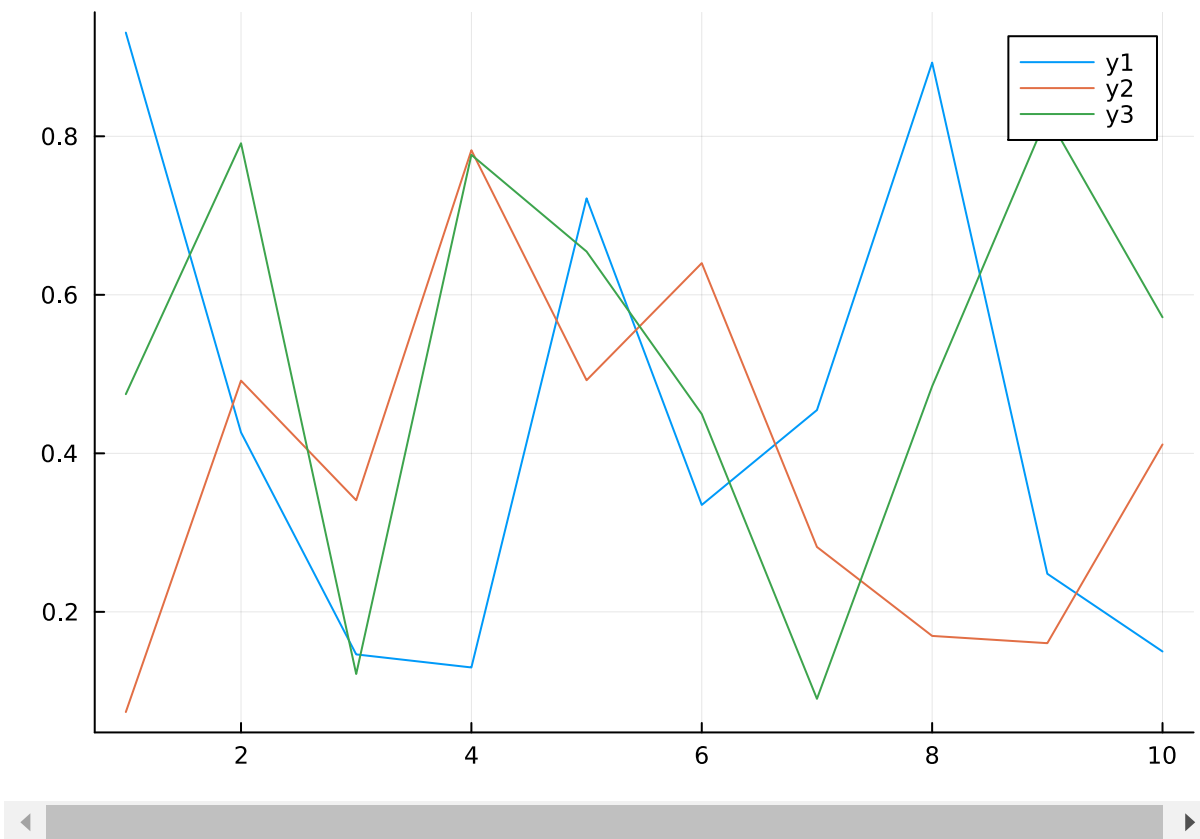In [25]:

```julia
x= 1:10; y = rand(10, 2)
plot(x, y)
```

Out[25]:

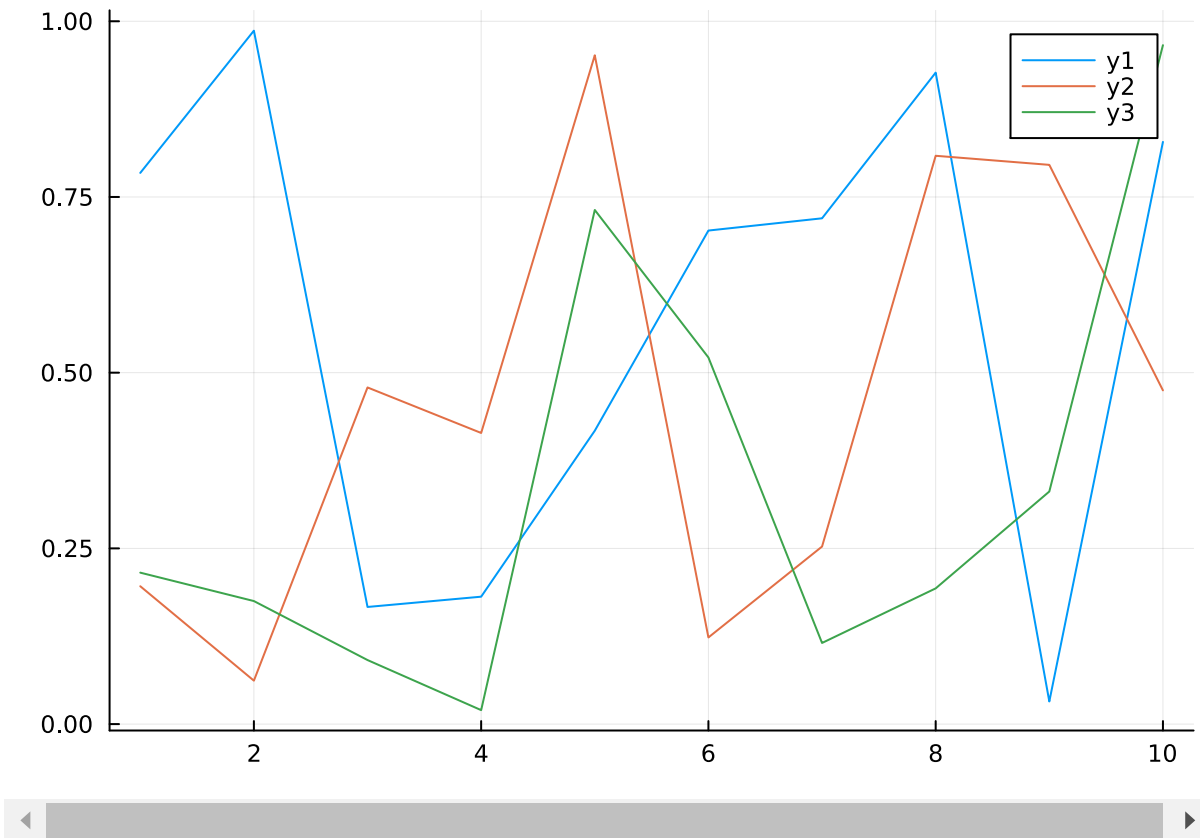In [26]:

```julia
z = rand(10)
plot!(x, z)
```

Out[26]:

In [27]:

```julia
x = 1:10;
y = rand(10, 2)
p = plot(x, y)
z = rand(10)
plot!(p, x, z)
```

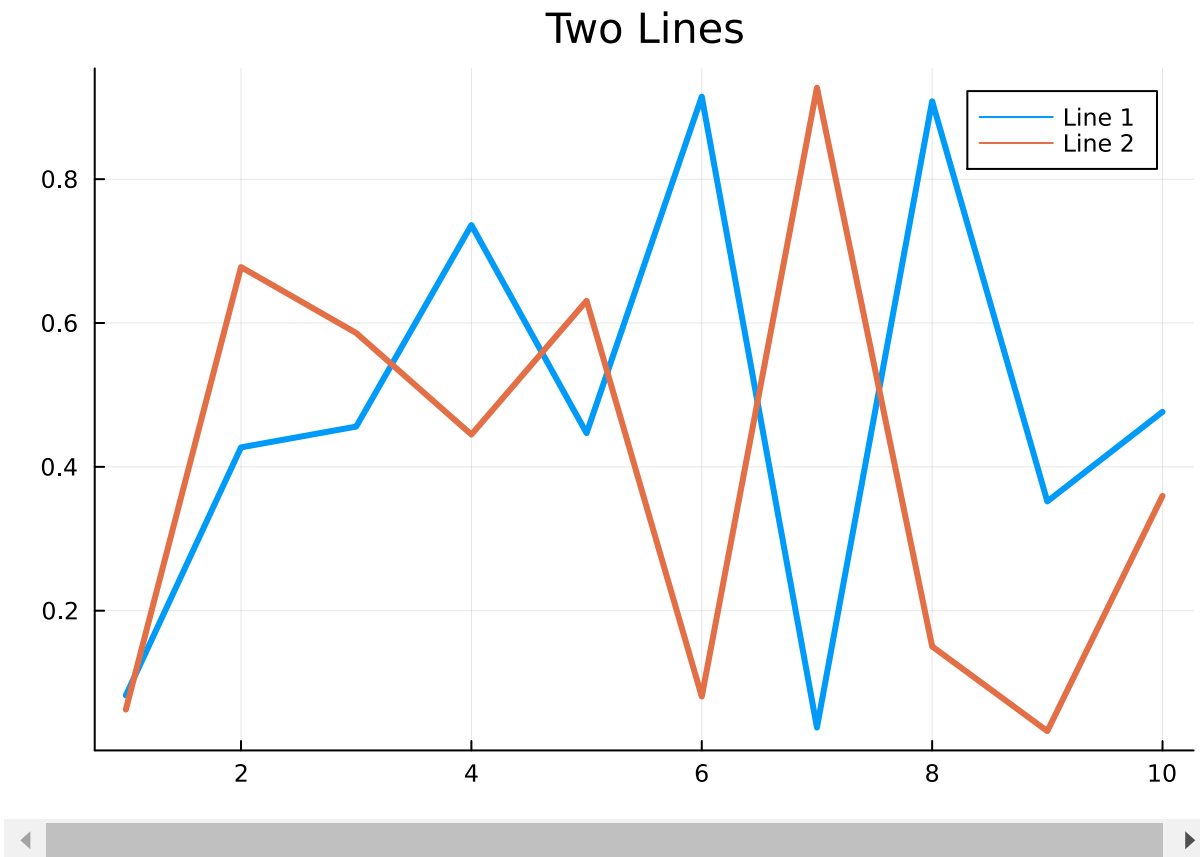Out[27]:

In [28]:

```julia
x = 1:10; y = rand(10, 2)
plot(x, y, title = "Two Lines", label = ["Line 1" "Line 2"], lw = 3)
```

Out[28]:

In [29]:

```julia
savefig("myplot.png")
savefig(p, "myplot.pdf")
```

In [30]:

```julia
Pkg.add("Optim")
```

```
  Resolving package versions...
  No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Project.toml`
  No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Manifest.toml`
```

In [31]:

```julia
import Optim
f(x) = (1.0 - x[1])^2 + 100.0 * (x[2] - x[1]^2)^2
```

Out[31]:

```
f (generic function with 1 method)
```

In [32]:

```
optimize(f, [0.0, 0.0])
```

UndefVarError: optimize not defined

Stacktrace:
 [1] top-level scope
   @ In[32]:1
 [2] eval
   @ .\boot.jl:368 [inlined]
 [3] include_string(mapexpr::typeof(REPL.softscope), mod::Module, code::Stri
ng, filename::String)
   @ Base .\loading.jl:1428

In [33]:

```
optimize(f, [0.0, 0.0], NelderMead())
```

UndefVarError: NelderMead not defined

Stacktrace:
 [1] top-level scope
   @ In[33]:1
 [2] eval
   @ .\boot.jl:368 [inlined]
 [3] include_string(mapexpr::typeof(REPL.softscope), mod::Module, code::Stri
ng, filename::String)
   @ Base .\loading.jl:1428

In [34]:

```
optimize(f, [0.0, 0.0], LBFGS())
```

UndefVarError: LBFGS not defined

Stacktrace:
 [1] top-level scope
   @ In[34]:1
 [2] eval
   @ .\boot.jl:368 [inlined]
 [3] include_string(mapexpr::typeof(REPL.softscope), mod::Module, code::Stri
ng, filename::String)
   @ Base .\loading.jl:1428

In [35]:

```julia
Pkg.add("Graphs")
Pkg.add("GraphPlot")
using Graphs
using GraphPlot
```

```
  Resolving package versions...
 No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Project.toml`
 No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Manifest.toml`
  Resolving package versions...
 No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Project.toml`
 No Changes to `C:\Users\AKSHAY\.julia\environments\v1.8\Manifest.toml`
```

In [36]:

```julia
g = path_graph(4)
add_edge!(g, 1, 2)
add_edge!(g, 1, 4)
add_edge!(g, 2, 4)
add_edge!(g, 3, 1)
add_edge!(g, 3, 2)
add_edge!(g, 4, 3)
```
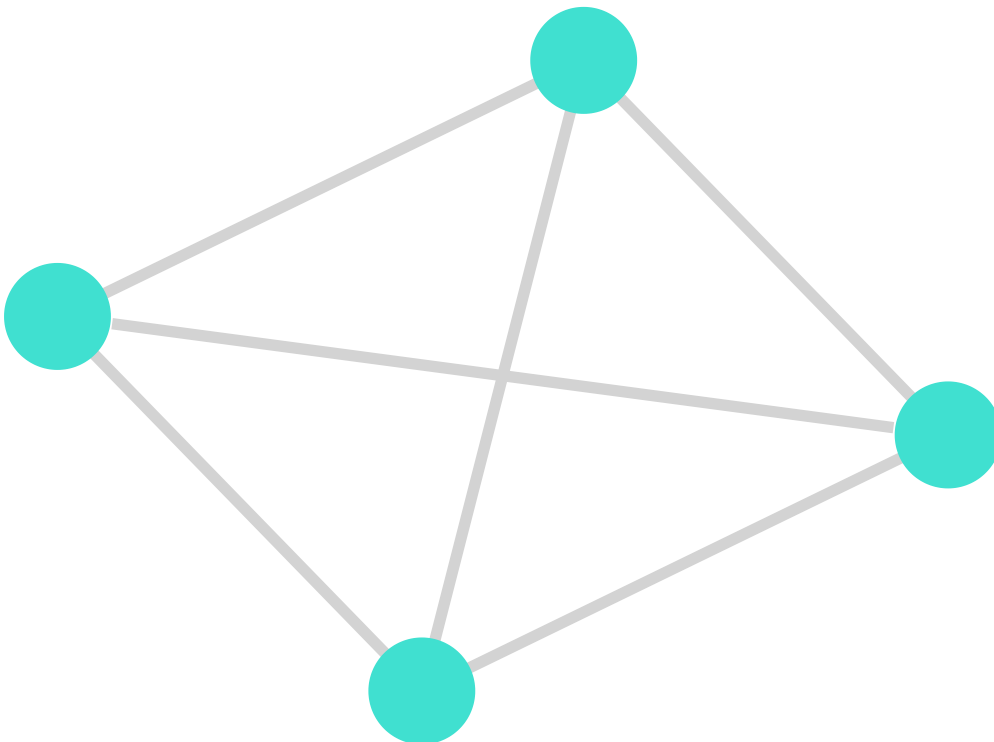
Out[36]:

false

In [37]:

```julia
gplot(g)
```

Out[37]:

In [38]:

```
nv(g)
```

Out[38]:

4

In [39]:

```
ne(g)
```

Out[39]:

6

In [40]:

```
G₁ = path_graph(3)
add_edge!(G₁, 1, 2)
add_edge!(G₁, 1, 3)
add_edge!(G₁, 2, 3)
gplot(G₁, nodelabel=1:3)
```

Out[40]: