Computer Implementation in \textbf{R}

- \textbf{R} is a system for statistical computation and graphics.
- \textbf{R} consists of
  - a language and
  - a run-time environment with graphics, a debugger, and access to certain system functions.
- \textbf{R} can run programs stored in script files.
- \textbf{R} is freely available from \url{http://www.r-project.org/}
- \textbf{R} is being developed for Unix and Windows
- \textbf{R} has many specific purpose modules ("add-on packages"). Our implementation uses add-on packages \texttt{graph} and \texttt{ggm}
> source("imset.R")
> D=DAG(a~e, c~a+b, d~a+b, f~e, g~d+f)
> drawGraph(D, xy)
source("imset.R")
D=DAG(a~e,c~a+b,d~a+b,f~e,g~d+f)
drawGraph(D,xy)
E=essentialGraph(D)
drawGraph(E,xy)
```r
> source("imset.R")
> D=DAG(a~e, c~a+b, d~a+b, f~e, g~d+f)
> drawGraph(D, xy)
> E=essentialGraph(D)
> drawGraph(E, xy)
> I=imset(E)
> printImset(I)
{
{ a b c d e f g } = 1  
{ } = 1
{ a e } = -1
{ e f } = -1
{ e } = 1
{ a b } = 2
{ a b c } = -1
{ b } = -1
{ a b d } = -1
{ d f } = 1
{ d f g } = -1
> 
```
> RC=reconstrComps(I)
> RC
[[1]]
1 "a" "b" "c"
[[2]]
1 "d" "f" "g"
[[3]]
1 "e" "f"
[[4]]
1 "a" "b" "d"
[[5]]
1 "a" "e"
[[6]]
1 "b"
[[1]]
[1] "a" "b" "c"

[[2]]
[1] "d" "f" "g"

[[3]]
[1] "e" "f"

[[4]]
[1] "a" "b" "d"

[[5]]
[1] "a" "e"

[[6]]
[1] "b"

> Er=reconstrEssentialGraph(RC)
> drawGraph(Er,xy1)
> 