

Problema 7 (Promethee)

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```
source("teoriadecision_funciones_multicriterio_diagram.R")
```

```
## Loading required package: shape
```

```
source("teoriadecision_funciones_multicriterio_utiles.R")
source("teoriadecision_funciones_multicriterio.R")
```

```
p7 = multicriterio.crea.matrizdecision(c (100,15,7,40,-50,
                                           200,25,7,60, -200,
                                           100,20,4,25, -25,
                                           200,30,20,70, -350,
                                           250,25,15,100,-500) ,
                                       numalternativas = 5,numcriterios = 5)

pesos.criterios = c(0.25/1.1,0.25/1.1,0.2/1.1,0.2/1.1,0.2/1.1)

tab.fpref = matrix(c(1,0,0,0,
                     1,0,0,0,
                     1,0,0,0,
                     1,0,0,0,
                     1,0,0,0) ,ncol=4,byrow=T)
```

PROMETHEE I

```
tab.Pthee.i = multicriterio.metodo.promethee_i(p7,pesos.criterios,tab.fpref)
tab.Pthee.i
```

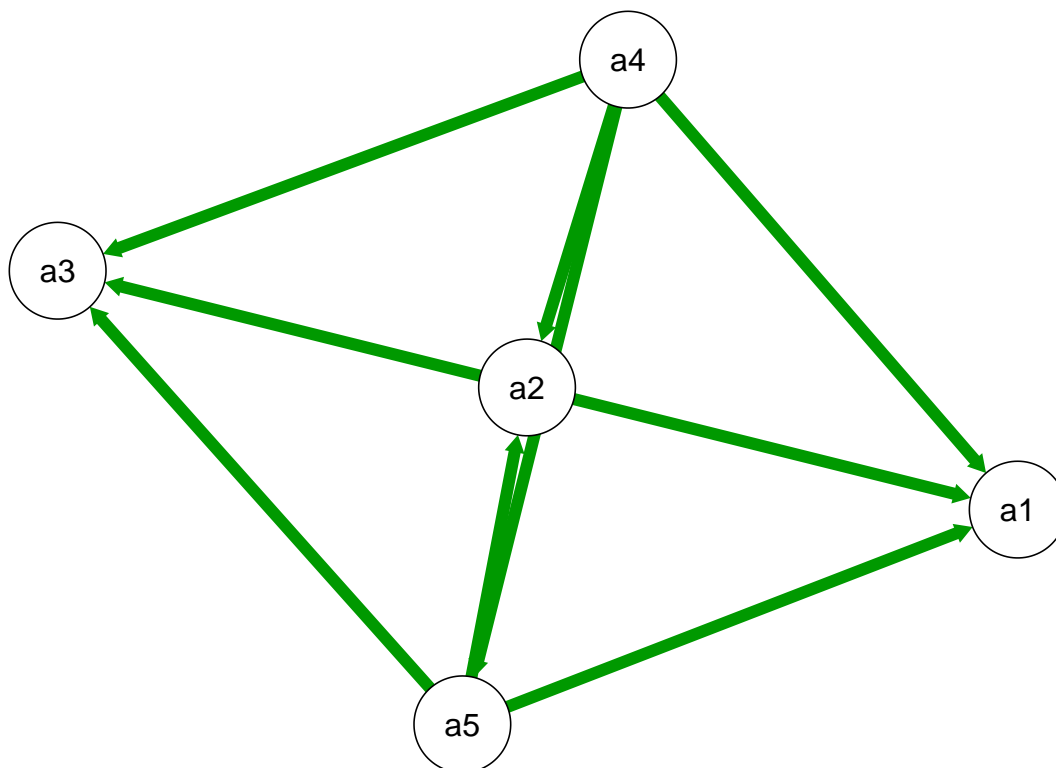
```
## $tabla.indices
##           a1           a2           a3           a4           a5
## a1 0.0000000 0.1818182 0.3636364 0.1818182 0.1818182
## a2 0.6363636 0.0000000 0.8181818 0.1818182 0.1818182
## a3 0.4090909 0.1818182 0.0000000 0.1818182 0.1818182
## a4 0.8181818 0.5909091 0.8181818 0.0000000 0.5909091
## a5 0.8181818 0.5909091 0.8181818 0.4090909 0.0000000
##
## $vflujos.ent
##           a1           a2           a3           a4           a5
```

```
## 0.9090909 1.8181818 0.9545455 2.8181818 2.6363636
##
## $vflujos.sal
##      a1      a2      a3      a4      a5
## 2.6818182 1.5454545 2.8181818 0.9545455 1.1363636
##
## $tablarelacionsupera
##      a1 a2 a3 a4 a5
## a1 0.5 0.0 0.0 0.0 0.0
## a2 1.0 0.5 1.0 0.0 0.0
## a3 0.0 0.0 0.5 0.0 0.0
## a4 1.0 1.0 1.0 0.5 1.0
## a5 1.0 1.0 1.0 0.0 0.5
```

```
require ("qgraph")
```

```
## Loading required package: qgraph
```

```
qgraph(tab.Pthee.i$tablarelacionsupera)
```

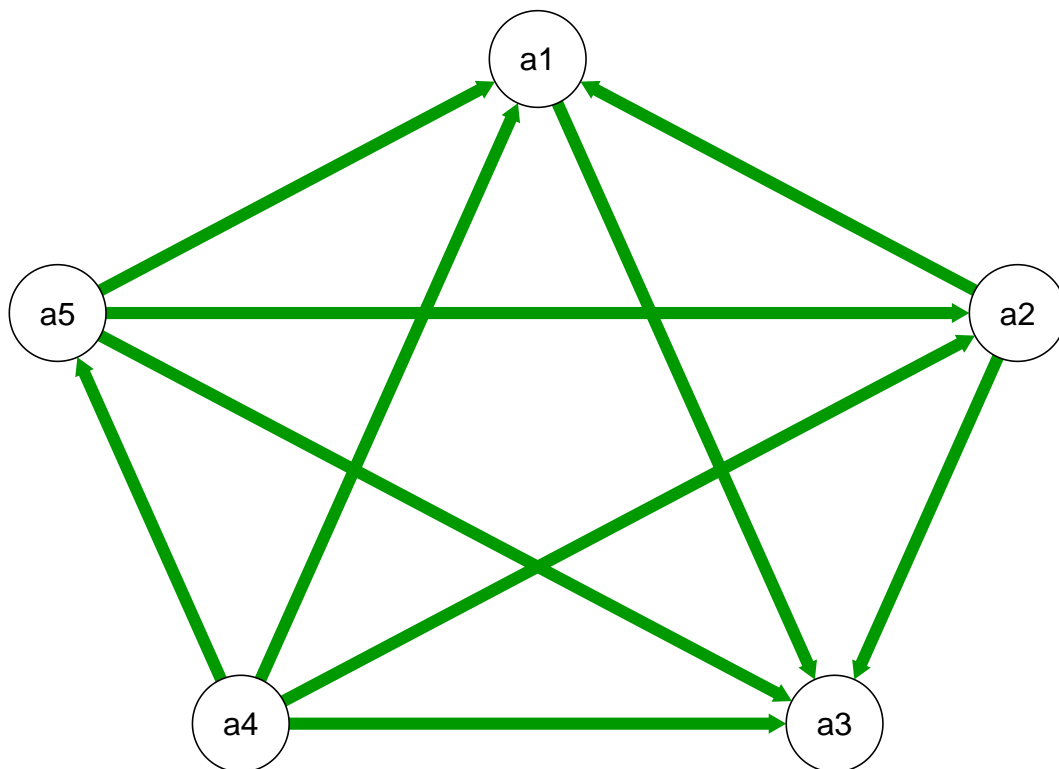


PROMETHEE II

```
tab.Pthee.ii = multicriterio.metodo.promethee_ii(p7,pesos.criterios,tab.fpref)
tab.Pthee.ii
```

```
## $tabla.indices
##      a1      a2      a3      a4      a5
## a1 0.0000000 0.1818182 0.3636364 0.1818182 0.1818182
## a2 0.6363636 0.0000000 0.8181818 0.1818182 0.1818182
## a3 0.4090909 0.1818182 0.0000000 0.1818182 0.1818182
## a4 0.8181818 0.5909091 0.8181818 0.0000000 0.5909091
## a5 0.8181818 0.5909091 0.8181818 0.4090909 0.0000000
##
## $vflujos.netos
##      a1      a2      a3      a4      a5
## -1.7727273 0.2727273 -1.8636364 1.8636364 1.5000000
##
## $tablarelacionsupera
##      a1 a2 a3 a4 a5
## a1 0.5 0.0 1.0 0.0 0.0
## a2 1.0 0.5 1.0 0.0 0.0
## a3 0.0 0.0 0.5 0.0 0.0
## a4 1.0 1.0 1.0 0.5 1.0
## a5 1.0 1.0 1.0 0.0 0.5
```

```
qgraph(tab.Pthee.ii$tablarelacionsupera)
```



PROMETHEE I (medias)

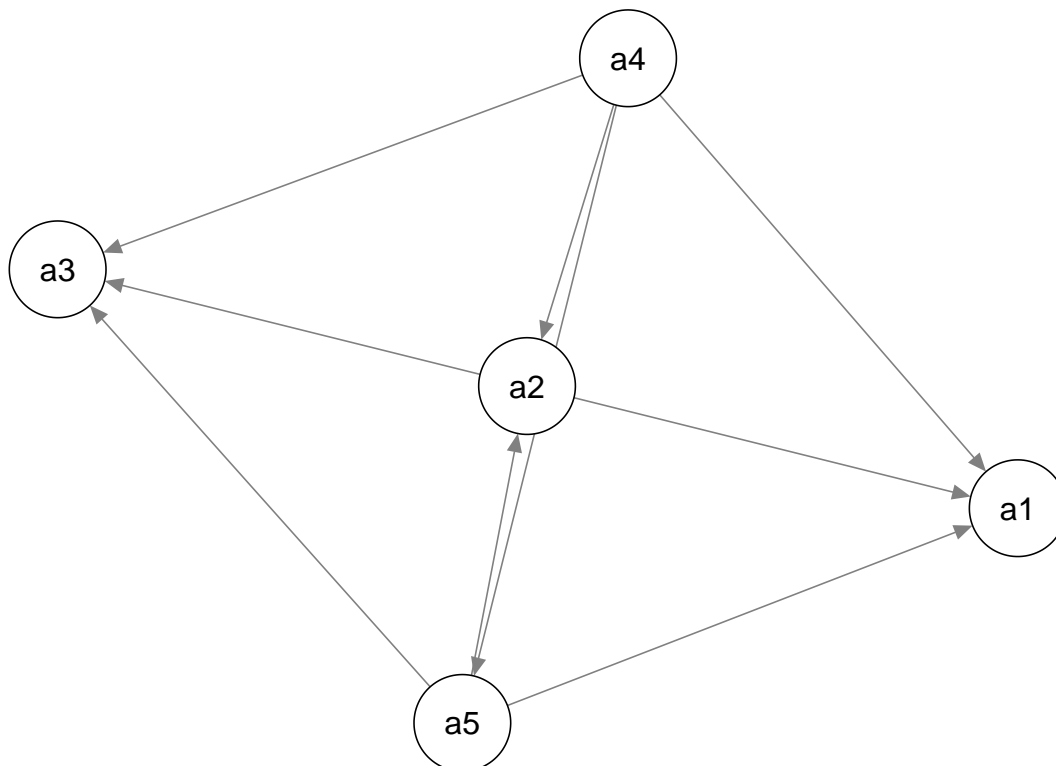
```
tab.Pthee.i_med = multicriterio.metodo.promethee_i_med(p7,pesos.criterios,tab.fpref)
tab.Pthee.i_med
```

```

## $tabla.indices
##      a1      a2      a3      a4      a5
## a1 0.0000000 0.1818182 0.3636364 0.1818182 0.1818182
## a2 0.6363636 0.0000000 0.8181818 0.1818182 0.1818182
## a3 0.4090909 0.1818182 0.0000000 0.1818182 0.1818182
## a4 0.8181818 0.5909091 0.8181818 0.0000000 0.5909091
## a5 0.8181818 0.5909091 0.8181818 0.4090909 0.0000000
##
## $vflujos.ent
##      a1      a2      a3      a4      a5
## 0.2272727 0.4545455 0.2386364 0.7045455 0.6590909
##
## $vflujos.sal
##      a1      a2      a3      a4      a5
## 0.6704545 0.3863636 0.7045455 0.2386364 0.2840909
##
## $tablarelacionsupera
##      a1 a2 a3 a4 a5
## a1  0  0  0  0  0
## a2  1  0  1  0  0
## a3  0  0  0  0  0
## a4  1  1  1  0  1
## a5  1  1  1  0  0

```

```
qgraph (tab.Pthee.i_med$tablarelacionsupera)
```

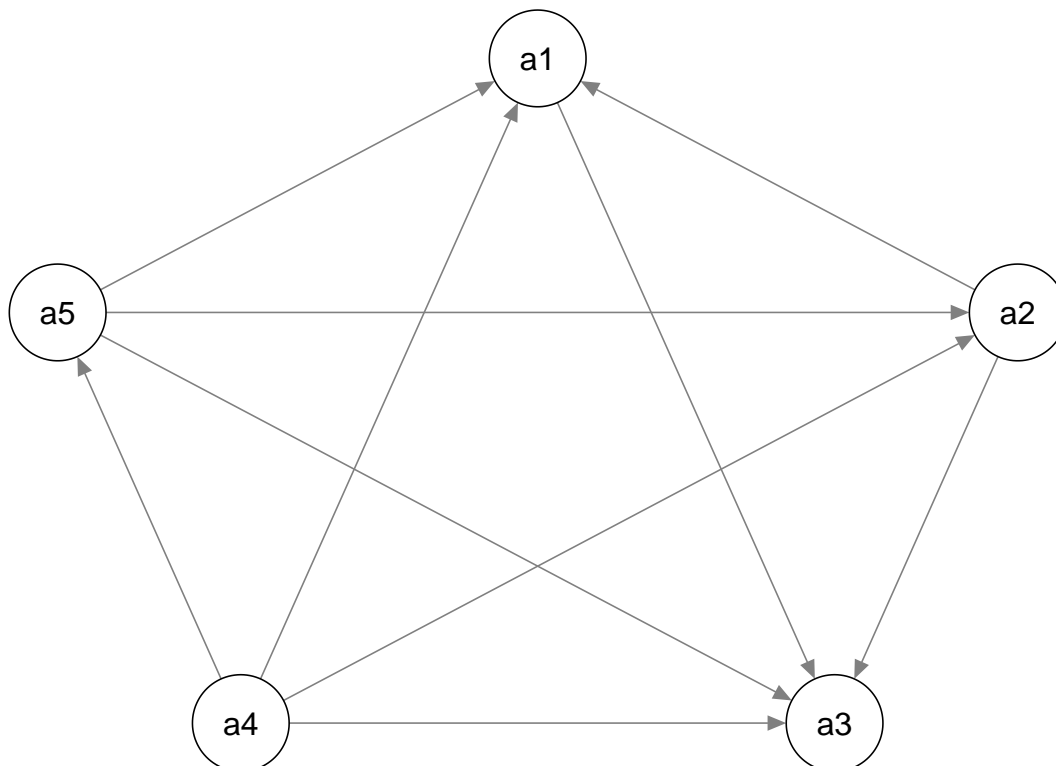


PROMETHEE II (medias)

```
tab.Pthee.ii_med = multicriterio.metodo.promethee_ii_med(p7,pesos.criterios,tab.fpref)
tab.Pthee.ii_med
```

```
## $tabla.indices
##      a1      a2      a3      a4      a5
## a1 0.0000000 0.1818182 0.3636364 0.1818182 0.1818182
## a2 0.6363636 0.0000000 0.8181818 0.1818182 0.1818182
## a3 0.4090909 0.1818182 0.0000000 0.1818182 0.1818182
## a4 0.8181818 0.5909091 0.8181818 0.0000000 0.5909091
## a5 0.8181818 0.5909091 0.8181818 0.4090909 0.0000000
##
## $vflujos.netos
##      a1      a2      a3      a4      a5
## -0.44318182 0.06818182 -0.46590909 0.46590909 0.37500000
##
## $tablarelacionsupera
##    a1 a2 a3 a4 a5
## a1  0  0  1  0  0
## a2  1  0  1  0  0
## a3  0  0  0  0  0
## a4  1  1  1  0  1
## a5  1  1  1  0  0
```

```
qgraph (tab.Pthee.ii_med$tablarelacionsupera)
```



Ordenación final alternativas Mét. Promethee II (medias)

```
order(tab.Pthee.ii_med$vflujos.netos,decreasing = T)
```

```
## [1] 4 5 2 1 3
```

Comparativa Promethee II: sin medias y con medias

```
order (tab.Pthee.ii$vflujos.netos,decreasing = T)
```

```
## [1] 4 5 2 1 3
```

```
order (tab.Pthee.ii_med$vflujos.netos,decreasing = T)
```

```
## [1] 4 5 2 1 3
```

Resolución con Promethee Windows

```
res = multicriterio.metodo.promethee_windows(p7, tab.fpref, pesos.criterios)
res = multicriterio.metodo.promethee_windows (p7, tab.fpref, pesos.criterios,
fminmax = c("max", "max", "max", "max","min"))

res02 = multicriterio.metodo.promethee_windows_kableExtra(res)
res02$tabEscenario
```

	Criterio1	Criterio2	Criterio3	Criterio4	Criterio5
Preferencias					
Min/Max	max	max	max	max	min
Pesos	0.227272727272727	0.227272727272727	0.181818181818182	0.181818181818182	0.181818181818182
Funciones Preferencias	Usual (1)	Usual (1)	Usual (1)	Usual (1)	Usual (1)
Q: Indiferencia	0	0	0	0	0
P: Preferencia	0	0	0	0	0
S: Gausiano	0	0	0	0	0
Estadísticas					
Minimo	100	15	4	25	25
Maximo	250	30	20	100	500
Media	170	23	10.6	59	225
Desviacion Tipica	60	5.1	5.95	25.77	180.28
Evaluaciones					
a1	100	15	7	40	50
a2	200	25	7	60	200
a3	100	20	4	25	25
a4	200	30	20	70	350
a5	250	25	15	100	500

```
res02$tabAcciones
```

	Rango	Phi	Phi.mas	Phi.menos
a4	1	0.4659	0.7045	0.2386
a5	2	0.3750	0.6591	0.2841
a2	3	0.0682	0.4545	0.3864
a1	4	-0.4432	0.2273	0.6705
a3	5	-0.4659	0.2386	0.7045

```
rownames(res$Acciones)
```

```
## [1] "a4" "a5" "a2" "a1" "a3"
```