

TareaSimplexDual

January 27, 2018

1 Simplex Dual

```
In [1]: import pandas as pd
```

```
In [2]: original = pd.DataFrame([{'z':1, 'A':-160, 'B':-120, 'C':-80, 's1':0,
                                   's2':0, 's3':0, 's4':0, 's5':0, 'RHS': 0},
                                   {'z':0, 'A':-1, 'B':-1, 'C':-1, 's1':1,
                                   's2':0, 's3':0, 's4':0, 's5':0, 'RHS': -1000},
                                   {'z':0, 'A':-1, 'B':0, 'C':0, 's1':0,
                                   's2':1, 's3':0, 's4':0, 's5':0, 'RHS': -150},
                                   {'z':0, 'A':0, 'B':-1, 'C':0, 's1':0,
                                   's2':0, 's3':1, 's4':0, 's5':0, 'RHS': -100},
                                   {'z':0, 'A':0, 'B':0, 'C':1, 's1':0,
                                   's2':0, 's3':0, 's4':1, 's5':0, 'RHS': 400},
                                   {'z':0, 'A':1, 'B':1, 'C':1, 's1':0,
                                   's2':0, 's3':0, 's4':0, 's5':1, 'RHS': 1000}],
                                   index=['z', 's1', 's2', 's3', 's4', 's5'],
                                   columns=['z', 'A', 'B', 'C',
                                           's1', 's2', 's3', 's4', 's5',
                                           'RHS'])

# Show
original
```

```
Out[2]:
```

	z	A	B	C	s1	s2	s3	s4	s5	RHS
z	1	-160	-120	-80	0	0	0	0	0	0
s1	0	-1	-1	-1	1	0	0	0	0	-1000
s2	0	-1	0	0	0	1	0	0	0	-150
s3	0	0	-1	0	0	0	1	0	0	-100
s4	0	0	0	1	0	0	0	1	0	400
s5	0	1	1	1	0	0	0	0	1	1000

```
In [3]: # Copiamos para trabajar
wip = original.copy()
```

```
# Primera iteración
wip.iloc[1] *= -1
wip.iloc[0] += wip.iloc[1] * 80
```

```
wip.iloc[4] += wip.iloc[1] * -1
wip.iloc[5] += wip.iloc[1] * -1
```

```
# Cambia variables del pivote
a = list(wip.columns)
a[3] = 's1'
wip.columns = a
a = list(wip.index)
a[1] = 'C'
wip.index = a
# Show
wip
```

```
Out[3]:
```

	z	A	B	s1	s1	s2	s3	s4	s5	RHS
z	1	-80	-40	0	-80	0	0	0	0	80000
C	0	1	1	1	-1	0	0	0	0	1000
s2	0	-1	0	0	0	1	0	0	0	-150
s3	0	0	-1	0	0	0	1	0	0	-100
s4	0	-1	-1	0	1	0	0	1	0	-600
s5	0	0	0	0	1	0	0	0	1	0

```
In [4]: # Segunda iteración
wip.iloc[4] *= -1
wip.iloc[0] += wip.iloc[4] * 40
wip.iloc[1] += wip.iloc[4] * -1
wip.iloc[3] += wip.iloc[4]
```

```
# Cambia variables del pivote
a = list(wip.columns)
a[2] = 's4'
wip.columns = a
a = list(wip.index)
a[4] = 'B'
wip.index = a

# Show
wip
```

```
Out[4]:
```

	z	A	s4	s1	s1	s2	s3	s4	s5	RHS
z	1	-40	0	0	-120	0	0	-40	0	104000
C	0	0	0	1	0	0	0	1	0	400
s2	0	-1	0	0	0	1	0	0	0	-150
s3	0	1	0	0	-1	0	1	-1	0	500
B	0	1	1	0	-1	0	0	-1	0	600
s5	0	0	0	0	1	0	0	0	1	0

```
In [5]: # Tercera iteración
wip.iloc[2] *= -1
wip.iloc[0] += wip.iloc[2] * 40
```

```
wip.iloc[3] += wip.iloc[2] * -1
wip.iloc[4] += wip.iloc[2] * -1
```

```
# Cambia variables del pivote
```

```
a = list(wip.columns)
```

```
a[1] = 's4'
```

```
wip.columns = a
```

```
a = list(wip.index)
```

```
a[2] = 'A'
```

```
wip.index = a
```

```
# Show
```

```
wip
```

```
Out[5]:
```

	z	s4	s4	s1	s1	s2	s3	s4	s5	RHS
z	1	0	0	0	-120	-40	0	-40	0	110000
C	0	0	0	1	0	0	0	1	0	400
A	0	1	0	0	0	-1	0	0	0	150
s3	0	0	0	0	-1	1	1	-1	0	350
B	0	0	1	0	-1	1	0	-1	0	450
s5	0	0	0	0	1	0	0	0	1	0

Valor mínimo = 110,000

A = 150

B = 450

C = 400