SDD_Graphes_Exercices_Corrigé

***Exercice 1* : matrices d'adjacences**

1/

```
mat_adj = [ [0, 1, 1, 1, 0, 0, 0],
            [1, 0, 0, 0, 1, 1, 1],
            [1, 0, 0, 0, 0, 0, 0],
            [1, 0, 0, 0, 0, 0, 1],
            [0, 1, 0, 0, 0, 1, 0],
            [0, 1, 0, 0, 1, 0, 0],
            [0, 1, 0, 1, 0, 0, 0]
          ]
```

2/

```
mat_adj = [ [0, 0, 1, 1, 0, 0, 0],
            [1, 0, 0, 0, 0, 1, 1],
            [1, 0, 0, 0, 0, 0, 0],
            [0, 0, 0, 0, 0, 0, 1],
            [0, 1, 0, 0, 0, 1, 0],
            [0, 0, 0, 0, 1, 0, 0],
            [0, 1, 0, 1, 0, 0, 0]
          ]
```

***Exercice 2* : matrice et liste d'adjacence**

Matrice d'adjacence

```
mat_adj = [ [0, 1, 1, 1, 0, 0],
            [1, 0, 0, 1, 0, 0],
            [1, 0, 0, 1, 1, 0],
            [1, 1, 1, 0, 1, 1],
            [0, 0, 1, 1, 0, 1],
            [0, 0, 0, 1, 1, 0]
          ]
```

Liste d'adjacence

```
list_adj = { "A" : ["B", "C", "D"],
             "B" : ["A", "D"],
             "C" : ["A", "D", "E"],
             "D" : ["A", "B", "C", "E", "F"],
             "E" : ["C", "D", "F"],
             "F" : ["D", "E"]
           }
```

***Exercice 3* : matrice d'adjacence et algorithme de Dijkstra**

Matrice d'adjacence

```
mat_adj = [ [0, 1, 1, 1, 0, 0, 0],
            [1, 0, 0, 0, 1, 1, 1],
            [1, 0, 0, 0, 0, 0, 0],
            [1, 0, 0, 0, 0, 0, 1],
            [0, 1, 0, 0, 0, 1, 0],
            [0, 1, 0, 0, 1, 0, 0],
            [0, 1, 0, 1, 0, 0, 0]
          ]
```

Chemin le plus court

D – A – B – F** pour **14 minutes.

***Exercice 4* : matrice d'adjacence et symétrie**

Un exemple de programme

```
def mat_sym(mat : [])->bool:
    # Parcours de la matrice
    for i in range(len(mat)) :
        for j in range(len(mat)):
            # Si deux éléments symétriques sont différents
            if mat[i][j] != mat[j][i] :
                return False

    return True
```

Tests

```
mat_adj = [ [0, 1, 1, 1, 0, 0, 0],
            [1, 0, 0, 0, 1, 1, 1],
            [1, 0, 0, 0, 0, 0, 0],
            [1, 0, 0, 0, 0, 0, 1],
            [0, 1, 0, 0, 0, 1, 0],
            [0, 1, 0, 0, 1, 0, 0],
            [0, 1, 0, 1, 0, 0, 0]
          ]
mat_non_adj = [ [0, 1, 1, 1, 0, 0, 0],
            [1, 0, 0, 0, 1, 1, 1],
            [1, 0, 0, 0, 1, 0, 0],
            [1, 0, 0, 0, 0, 0, 1],
            [0, 1, 0, 0, 0, 1, 0],
            [0, 1, 0, 0, 1, 0, 0],
            [0, 1, 0, 1, 0, 0, 0]
          ]

print(mat_sym(mat_adj))      # Attendu : True
print(mat_sym(mat_non_adj))  # Attendu : False
```

```
True
False
```