**Exercice 1.**

1)

```
def comptage(fichier):
    F = open(fichier,'r')
    TEXTE = F.read()
    F.close()
    Dic = {}
    for c in TEXTE:
        if c in Dic.keys():
            Dic[c] += 1
        else:
            Dic[c] = 0
    return Dic
```

2)

```
def listes(Dic):
    car = []
    occ = []
    for (k,v) in Dic.items():
        car.append(k)
        occ.append(v)
    return car, occ
```

3)

```
def caracteres(fichier):
    Dic = comptage(fichier)
    car, occ = listes(Dic)
    # Tri par insertion
    N = len(occ)
    for i in range(1,N):
        x, y = occ[i], car[i]
        k = i
        while k>0 and occ[k-1] < x:
            occ[k] = occ[k-1]
            car[k] = car[k-1]
            k = k-1
        occ[k] = x
        car[k] = y
    # Affichage
    for i in range(N):
        print(car[i],':',occ[i],'occurences')
```

**Exercice 2.**

1)

```
alphabet = "abcdefghijklmnopqrstuvwxyz"
```

2)

```
Dic = {}
for k in range(26):
    Dic[alphabet[k]] = k
```

3)

```
def cesar(n):
    Dic1 = {}
    for k in range(26):
        Dic1[alphabet[k]] = (k+n)%26
    return Dic1
```

4)

```
def cryptage(texte,n):
    Dic = cesar(n)
    crypte=""
    for c in texte:
        if not('a'<=c<='z'):
            crypte += c
        else:
            crypte += alphabet[Dic[c]]
    return crypte
```

5)

```
def decryptage(texte,n):
    return cryptage(texte,-n)
```