

## 09-fichiers-csv

April 4, 2019

### 1 Comment importer les données numériques d'un tableur scientifique dans un programme python ?

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Le programme présenté ci-dessous est adapté à des fichiers .csv (type tableur) obtenus lors de pointages vidéo. Il devra évidemment être adapté pour des fichiers obtenus lors d'autres expériences.

1. Enregistrer ou exporter le fichier contenant votre tableau de données sous format .csv dans le dossier contenant votre notebook (fichier .ipynb) ou votre programme python (fichier.py).
  - Dans Regressi, enregistrer le fichier sous le format (type) OpenOffice, CSV (choisir *réel* Vrai CSV *z* dans la fenêtre qui s'affiche alors).
  - Dans Loggerpro, exporter le fichier comme CSV...
  - Dans Aviméca, exporter les données dans Regressi puis vous reporter à la ligne ci-dessus.

Attention: les logiciels de pointage retournent des tableaux de colonnes avec des entêtes (une à deux lignes) qu'il faudra par la suite retranscrire sous forme de listes (une liste par colonne) sans tenir compte des entêtes.

Voici une capture d'écran du fichier parabole.csv obtenu à l'aide de Regavi/Regressi ouvert

	A	B	C	
1	t	x	y	
2	s	m	m	
3	0	-0,00280894	0	
4	0,04	0,06460572	0,14325617	
5	0,08	0,14044722	0,26684972	
6	0,12	0,21347978	0,37639855	
7	0,16	0,28651233	0,47190267	
8	0,2	0,36235383	0,55336205	
9	0,24	0,43538639	0,61796778	
10	0,28	0,51403683	0,66571983	
11	0,32	0,58426044	0,69380928	
12	0,36	0,66291089	0,71347189	
13	0,4	0,73875239	0,71347189	
14	0,44	0,81459389	0,69661822	
15	0,48	0,89043539	0,66010194	
16	0,52	0,96627689	0,61796778	
17	0,56	1,03930944	0,55336205	
18	0,6	1,11515094	0,46909372	
19	0,64	1,19099244	0,37358961	
20	0,68	1,26964289	0,26123183	
21	0,72	1,3398665	0,13482933	
22				

sous Excel fichier excel.bb

Le même fichier ouvert sous

Jupyter

Notebook

fichier

jupyter.bb

jupyter parabol.csv ✓ il y a 9 minutes

File Edit View Language

```

1 t;x;y
2 s;m;m
3 0;-0,0028089444369039;0
4 0,04;0,0646057220487898;0,143256166282099
5 0,08;0,140447221845195;0,266849721505871
6 0,12;0,213479777204697;0,376398554545123
7 0,16;0,286512332564198;0,471902665399856
8 0,2;0,362353832360603;0,553362054070069
9 0,24;0,435386387720105;0,617967776118859
10 0,28;0,514036831953414;0,665719831546225
11 0,32;0,584260442876012;0,693809275915264
12 0,36;0,662910887109321;0,713471886973591
13 0,4;0,738752386905726;0,713471886973591
14 0,44;0,814593886702132;0,696618220352168
15 0,48;0,890435386498537;0,660101942672417
16 0,52;0,966276886294942;0,617967776118859
17 0,56;1,03930944165444;0,553362054070069
18 0,6;1,11515094145085;0,469093720962952
19 0,64;1,19099244124725;0,373589610108219
20 0,68;1,26964288548056;0,261231832632063
21 0,72;1,33986649640316;0,134829332971387
22 |

```

2. Les cellules suivantes contiennent les lignes de code qui vous permettront d'afficher votre tableau de données sous forme de listes (une liste par colonne de votre tableau)

In [1]: # Chargement de la bibliothèque csv afin de pouvoir lire par la suite le fichier csv

```

import csv

In [ ]: # création de la fonction appelée charge_fichier_csv() qui permettra de récupérer les

def charge_fichier_csv(fichier):

    # ouverture du fichier .csv
    # Le début du chemin n'a pas besoin d'être spécifié si le fichier .csv se trouve dans
    # notebook
    # Il est aussi possible d'utiliser la ligne de commande: f = open(fichier, 'r', encoding=

        with open(fichier, 'r', encoding='utf-8') as f :

    # lecture du fichier à l'aide de la fonction csv.reader.
    # Il faut préciser le délimiteur de colonnes utilisé dans le fichier .csv (ici c'est l

        rfichier = csv.reader(f, delimiter=";")

    # création et initiation du tableau sous forme de liste qui recevra les listes de nomb

        tableau=[]

    # le contenu d'une cellule est initialement lu comme une chaîne de caractères
    # nous voulons obtenir des listes de nombres réels correspondant aux colonnes de notre
    # donc :
    #     - il ne faut pas prendre en compte les lignes correspondant aux entêtes
    #     - il faut convertir les chaînes de caractères en nombres réels décimaux
    # attention : les virgules des nombres décimaux doivent être remplacées par des points

        for row in rfichier:      # pour chaque ligne du fichier

            if row[0][0] not in ("0","1","2","3","4","5","6","7","8","9",",","."): #
                # le contenu de la première cellule de
                # en testant le premier caractère de c
                continue           # Si le test est validé, grâce à la co
                # début de la boucle for sans continue
                # car on suppose que la ligne est une
                # et on change de ligne!

            for i in range (len(row)):      # on parcourt chaque cellule d'une lig
                X = []                     # création d'une liste vide qui contiendra les
                tableau.append(X)           # ajout de cette
                tableau[i].append(float(row[i].replace(",","."))) # ajout dans cett
                                                                    # la ligne en la
            break                          # une fois qu'une seule ligne a été entièrement p
            # "for row in rfichier" grâce à la commande "bre
            # supplémentaire à chaque nouvelle ligne

```

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for row in rfichier:                # reprend le parcours des lignes du tableau (s
    for i in range (len(row)):
        tableau[i].append(float(row[i].replace(",",'.')))

return (tableau)

```

Voici la fonction sans commentaire afin d'y voir un peu plus clair !

```

In [3]: def charge_fichier_csv(fichier):
    with open(fichier, 'r', encoding='utf-8') as f :
        rfichier = csv.reader(f, delimiter=";")
        tableau=[]
        for row in rfichier:
            if row[0][0] not in ("0","1","2","3","4","5","6","7","8","9",",","."):
                continue
            for i in range (len(row)):
                X = []
                tableau.append(X)
                tableau[i].append(float(row[i].replace(",",'.')))
            break
        for row in rfichier:
            for i in range (len(row)):
                tableau[i].append(float(row[i].replace(",",'.')))
    return (tableau)

```

```

In [4]: tableau = charge_fichier_csv('parabole.csv')
        t=tableau[0]
        print(t)
        x=tableau[1]
        print(x)
        y=tableau[2]
        print(y)

```

```

[0.0, 0.04, 0.08, 0.12, 0.16, 0.2, 0.24, 0.28, 0.32, 0.36, 0.4, 0.44, 0.48, 0.52, 0.56, 0.6, 0.64, 0.68, 0.72, 0.76, 0.8, 0.84, 0.88, 0.92, 0.96, 1.0]
[-0.002808944, 0.064605722, 0.140447222, 0.213479777, 0.286512333, 0.362353832, 0.435386388, 0.504378944, 0.5733715, 0.642364056, 0.711356611, 0.780349167, 0.849341722, 0.918334278, 0.987326833, 1.056319389, 1.125311944, 1.1943045, 1.263297056, 1.332289611, 1.401282167, 1.470274722, 1.539267278, 1.608259833, 1.677252389, 1.746244944, 1.8152375, 1.884230056, 1.953222611, 2.022215167, 2.091207722, 2.160200278, 2.229192833, 2.298185389, 2.367177944, 2.4361705, 2.505163056, 2.574155611, 2.643148167, 2.712140722, 2.781133278, 2.850125833, 2.919118389, 2.988110944, 3.0571035, 3.126096056, 3.195088611, 3.264081167, 3.333073722, 3.402066278, 3.471058833, 3.540051389, 3.609043944, 3.6780365, 3.747029056, 3.816021611, 3.885014167, 3.954006722, 4.022999278, 4.091991833, 4.160984389, 4.229976944, 4.2989695, 4.367962056, 4.436954611, 4.505947167, 4.574939722, 4.643932278, 4.712924833, 4.781917389, 4.850910944, 4.9199035, 4.988896056, 5.057888611, 5.126881167, 5.195873722, 5.264866278, 5.333858833, 5.402851389, 5.471843944, 5.5408365, 5.609829056, 5.678821611, 5.747814167, 5.816806722, 5.885799278, 5.954791833, 6.023784389, 6.092776944, 6.1617695, 6.230762056, 6.299754611, 6.368747167, 6.437739722, 6.506732278, 6.575724833, 6.644717389, 6.713710944, 6.7827035, 6.851696056, 6.920688611, 6.989681167, 7.058673722, 7.127666278, 7.196658833, 7.265651389, 7.334643944, 7.4036365, 7.472629056, 7.541621611, 7.610614167, 7.679606722, 7.748599278, 7.817591833, 7.886584389, 7.955576944, 8.0245695, 8.093562056, 8.162554611, 8.231547167, 8.300539722, 8.369532278, 8.438524833, 8.507517389, 8.576510944, 8.6455035, 8.714496056, 8.783488611, 8.852481167, 8.921473722, 8.990466278, 9.059458833, 9.128451389, 9.197443944, 9.2664365, 9.335429056, 9.404421611, 9.473414167, 9.542406722, 9.611399278, 9.680391833, 9.749384389, 9.818376944, 9.8873695, 9.956362056, 10.025354611, 10.094347167, 10.163339722, 10.232332278, 10.301324833, 10.370317389, 10.439310944, 10.5083035, 10.577296056, 10.646288611, 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