In [4]:

```
import numpy as np
import random
import matplotlib.pyplot as plt
from operator import attrgetter
import matplotlib.pyplot as plt
import heapq
from operator import itemgetter
from pydub import AudioSegment # for audio
from pydub.playback import play # for audio
from playsound import playsound # new
```

In [5]:

```
# file reading and sonification line by line
```

In [7]:

```
# method to quickly read from a file: from internet

# next: concatenate the audio files, to get only one file for each robot, and th

# I got x, z coordinates (called here x, y) as .txt from Webots + C

# add information on trash detection as an added sound or modified one in corres
# (enrich the sound library in notes_)

with open('fx.txt', 'r') as fx:
    with open('fy.txt', 'r') as fy:
        linesx = (linex.strip() for linex in fx if linex)
        linesy = (liney.strip() for liney in fy if liney)
        x = [float(linex) for linex in linesx]
        y = [float(liney) for liney in linesy]
        for k in range(1,400):
            print(x[k], y[k])
         # sonification: here with inputs from -1 to 1
         # troubles with A#, D#, and C#: solved by changing the names: # --> _sh
            if (x[k] == 0):
                if (y[k] == 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tC.m
                    print("tC")
            if (x[k] > -1 and x[k] <= -0.6):
                if (y[k] < 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tB.m
                    print("tB")
                if (y[k] >= 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tC_s
                    print("tC#")
            if (x[k] > -0.6 and x[k] <= -0.3):
                if (y[k] < 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tA_s
                    print("tA#")
                if (y[k] >= 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tD.m
                    print("tD")
            if (x[k] > -0.3 and x[k] <= 0):
                if (y[k] < 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tD_s
                    print("tD#")
                if (y[k] >= 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tA.m
                    print("tA")
            if (x[k] > 0 and x[k] <= 0.3):
                if (y[k] < 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tE.m
                    print("tE")
                if (y[k] >= 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tG_s
                    print("tG#")
            if (x[k] > 0.3 and x[k] <= 0.6):
                if (y[k] < 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tF.m
                    print("tF")
                if (y[k] >= 0):
                    playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tG.m
                    print("tG")
            if (x[k] > 0.6 and x[k] <= 1):
```

```
                playsound("/Users/mariamannone/Desktop/xyz_robot/notes_/tF_sharp
                print("tF#")
```

```
tA#
-0.499012 -0.022151
tA#
-0.499591 -0.023151
tA#
-0.500166 -0.024144
tA#
-0.500736 -0.025131
tA#
-0.501303 -0.026111
tA#
-0.501866 -0.027084
tA#
-0.502425 -0.02805
tA#
-0.50298 -0.029011
tA#
-0.503532 -0.029964
tA#
-0.504079 -0.030911
```

In [ ]:

```

```

In [ ]:

```

```

In [ ]:

```
# and an added sound for the trash detection, even a small cluster or a sound ei
```