Description of Stem assignments

1 Assignment 1

1.1 Question 1

1.1.1 Use the sorted () function
• All the dataset has been sorted. We can find the newest and oldest datasets in the new dataset.
• Then print the last column in the newest and oldest datasets.
• Use the display (IMG ()) function to display the oldest and the newest images.

1.1.2 Use the sorted () function
• Use the np.argmax () function to find the biggest value in the numpy array.
• Use the np.argmin () function to find the smallest value in the numpy array.
• Find the last column of the biggest and the smallest values
• Use the display (IMG ()) function to display the oldest and the newest images.

1.2 Question 2

1.2.1 Create the volumes of each object
• Define the length, width and height of the dataset.
• Area= length*width
  Volume=area*height
  Use the np.multiply() function to multiply values

1.2.2 Calculate the 20% of the volume
• Sort the volume and use the len() function to calculate the length of the volume
• Then calculate the volume*0.2
• Find the values from volume*0.2 to -volume*0.2-1

1.2.3 Plot a histogram of the remaining object's volumes

• Define the data from the interval and put it into plt.hist()

• Chose the title, xlabel and ylabel, then use the plt.show() function to draw the histogram.

1.3 Question 3

1.3.1 What are the most common category and group?
- Find the category and group column from the dataset
- Find the mode of the category and group
- Calculate the number of occurrences

1.3.2 What percentage of the total items to they each make up?

percentage= occurrences of the most common category / the total category * 100%

1.4 Question 4

1.4.1 Plot date of objects against width from everything added to the collection between 1850 and 1900.
- sort the dataset and find the date of objects between 1850 and 1900
- width, begindate and from everything added to the collection between 1850 and 1900

1.4.2 If you can put in a legend mapping material to colour.
- use the mode to find all the materials
- then use the filter function to find the width of each material
- Set the x-axis/y-axis for each material
- Solution1 use the plt.pot to draw---put all data into the function
- Solution2---use the histogram to draw--- define the different colours for the different materials, define the histogram and then plt.show()

1.4.3 Write a short paragraph describing what the plot tells about the museums collection in relation to time, width and material.

2 Assignment 2

2.1 We want to save the onsets as we go (the sample location and the value) and then plot them on the same plot as the original waveform

- Use the librosa.load() to read audio
- Create the empty []
- Define the start and the end of the window
- Define the size of the window
- Find the mean of the whole audio and use the abs() to make the result to be positive numbers
- Create the if function to make the sample to be the maximum of the window, sample more than the mean of all audio and time less than 0
- Append the results to the empty[], and time1 reduce 1
- Define the x-axis and y-axis
- Plot audio file

- Plot all the onsets time

2.2 Experiment with different settings for your onset detector.

- Decrease the window size, and the results increase.
- Increase wait time and the results decrease.
- Write a short discussion on the advantages and disadvantages of changing the window size and wait time.

3   Assignment 3

- Create an experimental programme to research if virtual environments improve human positivity for movement in confined spaces.
- The conditions (confined space with or without screens) have been set.
- Location of participants' hands based on motion capture gloves to record the data.
- Discuss confounding variables and experimental errors, internal and external validity and some ethical issues.