

Homework 03/04/2023

1. Write a summary for the following concept: class, method, list, tuple, and dictionary and set. Each item should have at least two sentences.

2. Write a class named AdvancedSpeaker. This class has the following 4 functions:

```
#play a random cat sound  
def playCatSound()
```

```
#play a random dog sound  
def playDogSound()
```

```
#play a random doorbell sound  
def playDoorBellSound()
```

```
#play a random beep sound  
def playBeepSound()
```

Then, write example codes to test each function of AdvancedSpeaker.

3. Write a class named ButtonControlDisplay, which can provide the following two functions.

def buttonControlNumbers(self, min, max)

Use the hub's left and right button to show different numbers on hub's digital_matrix. Initially, the hub shows $(\text{min_max})/2$. When you press the left button, the number will decrease by 1. When you press the right button, the number will increase by 1. The numbers to be shown are limited in the range of $[\text{min}, \text{max}]$, where $\text{min} \geq 0$ and $\text{max} \leq 9$.

def buttonControlLetters(self, min, max)

Use the hub's left and right button to show different letters on hub's digital_matrix. Initially, the hub shows the middle letter in the range of $[\text{min}, \text{max}]$. For example, if $\text{min} = 'b'$ and $\text{max} = 'd'$, then the middle letter is 'c'. When you press the left button, the hub will show the left neighbour of the current letter. When you press the right button, the number will show the right neighbour letter. The letters to be shown are limited in the range of $[\text{min}, \text{max}]$, where $\text{min} \geq 'a'$ and $\text{max} \leq 'z'$.

After finishing the above class, please use this class to finish the following task:

If the colorsensor detects white color, the hub will show the digital numbers controlled by the left/right buttons (number mode); if the colorsensor detects black, the hub will switch to the letter mode. Everytime the colorsensor is switched to a different mode, the character currently being shown on the hub will be 'remembered'. That is, when the hub switches back to a mode, the digital_matrix will start from the previously 'remembered' character.