CENG 113 – Programming Basics

Lab 10

**Functions & Lists
(cont)**

List Overlap

Define following functions:

- **get_rand_list** function takes **b**,**e** and **N**, and generates a list of random integers in **[b, e]** with length of **N**, and returns the list.

- **get_overlap** function takes two lists and returns the intersection of them.

In main program,

1) Define two randomly generated lists for **b=0**, **e=10**, **N=5**.
2) Print both lists and their overlap.

Clustering

Define **cluster** function that takes a list of numbers, and clusters the numbers using minimum number of clusters such that a number cannot be greater than twice any number in the same cluster. Then, it returns the clusters.

- e.g. 5 and 1 cannot be in the same cluster, because 5 > 2*1.

Example:
input: [1, 10, 2, 9, 5, 113, 43, 27, 8, 50, 47]
output: [[1,2],[10,9,5,8],[113],[43,27,50,47]]

Finding AA Students

Define average function that takes a list of students' midterm 1, midterm 2 and final exam grades. Then, it calculates each student's average grade by using the weights 30%, 30% and 40%. Average grades are added into a list. The function returns the created list.

i.e.: `[[50,90,60],[15,60,75],[60,60,60]]`

- Call it from main function with the above list as the argument.

Finding AA Students (cont.)

Define normalize_grades function that takes a list of average grades. It finds the maximum average grade and calculates the difference between this grade and 100, then increases all students' average grades by this difference.

Define find_AA function that takes normalized average grades, stores those greater than 90 into a list, and returns the generated list.

- Call both functions from main function.