Task1:

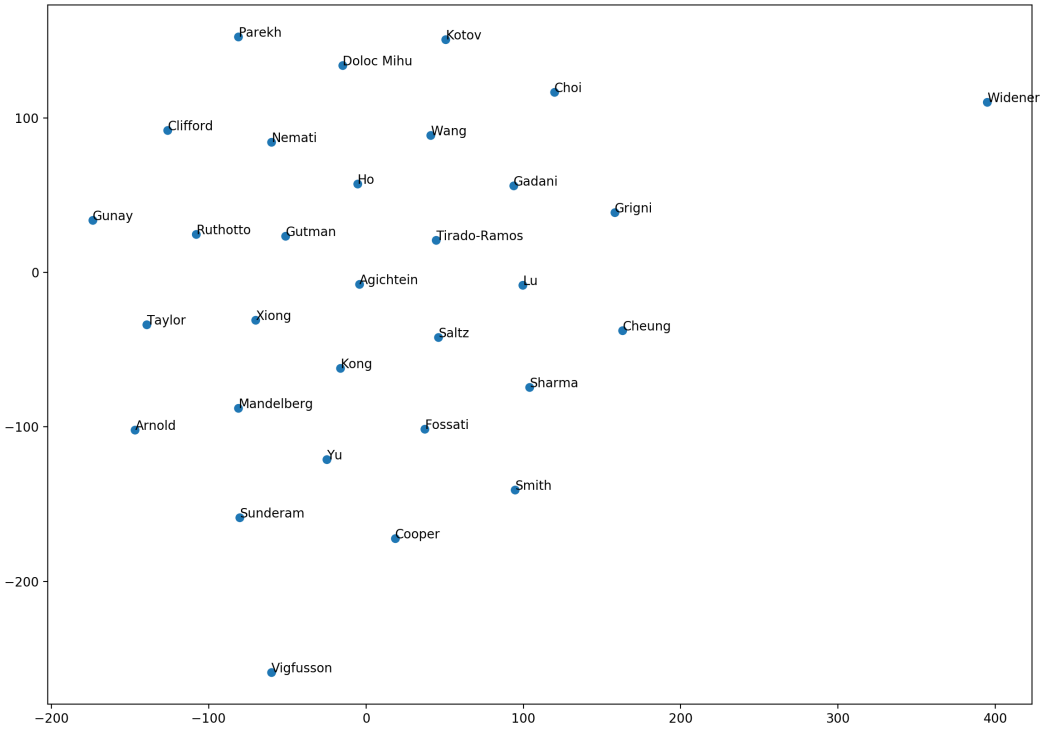
I first make an empty dictionary named trend and loop through the `course_info`, where I assign key of trend as coursed and three variables spring summer and fall as counter. At first these three variables are all 0, if a courseid is not in the trend then add it to the dictionary with counters are equal to 0. If a courseid is already in the trend then check its season and add one count to the corresponding season. Thus, through the whole loop the value will contain a tuple for each class that this class appear how many times and during what season. Finally, for each tuple I divide each season by the sum of this course?s counter and get the rate.

Task2:

Make an empty dictionary named topic and let the key equals to professors name in the correct order. (First name, Last name). Loop through `course_info` and filter out graduate courses by checking if the courseid starts at a number larger than 4. If it is, call method `what_is_prof_x_special_courses` and make the returned dictionary as the key of topics. So that we are checking each professors and their special courses by computing TF.IDF scores.

Task3:

We can see that figure1 and figure 3 both have some extreme value appeared while figure 2 figure 4 and figure 5 are more evenly distributed around 0 so they make more sense. Sometimes we could get some extreme values by random and we want to avoid them.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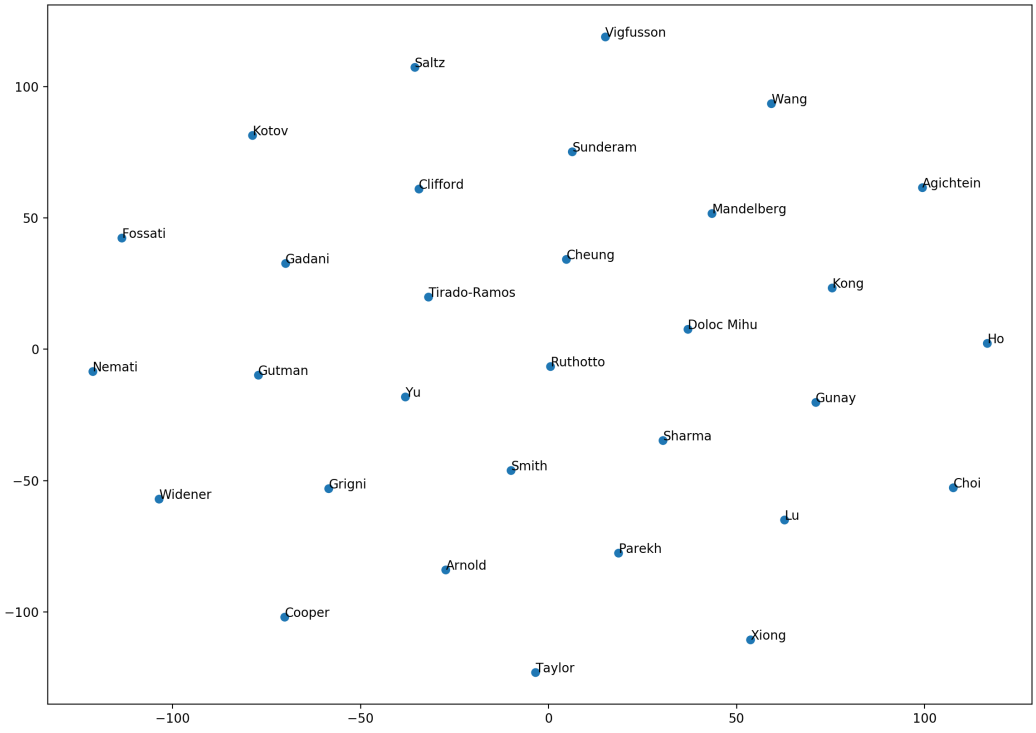
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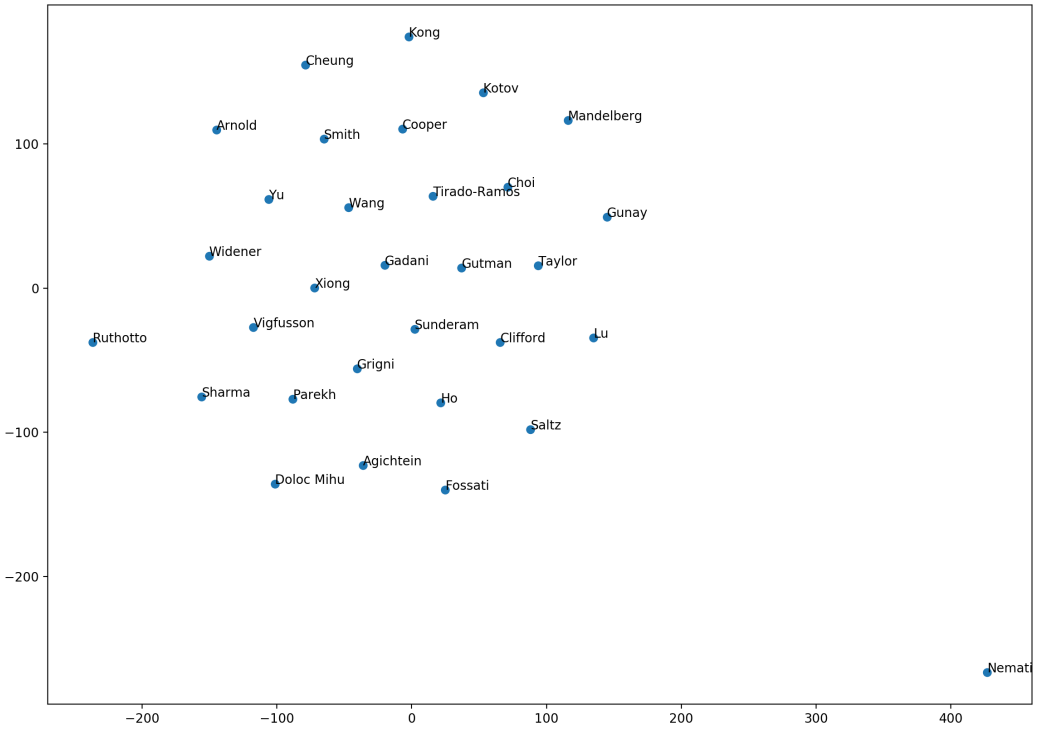
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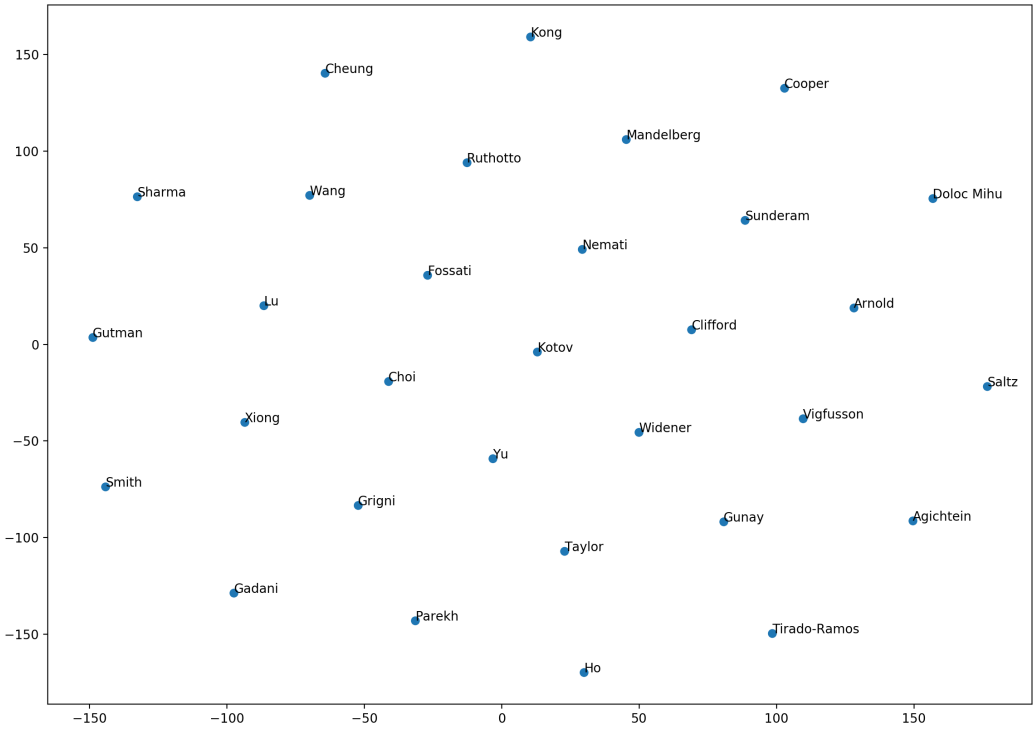
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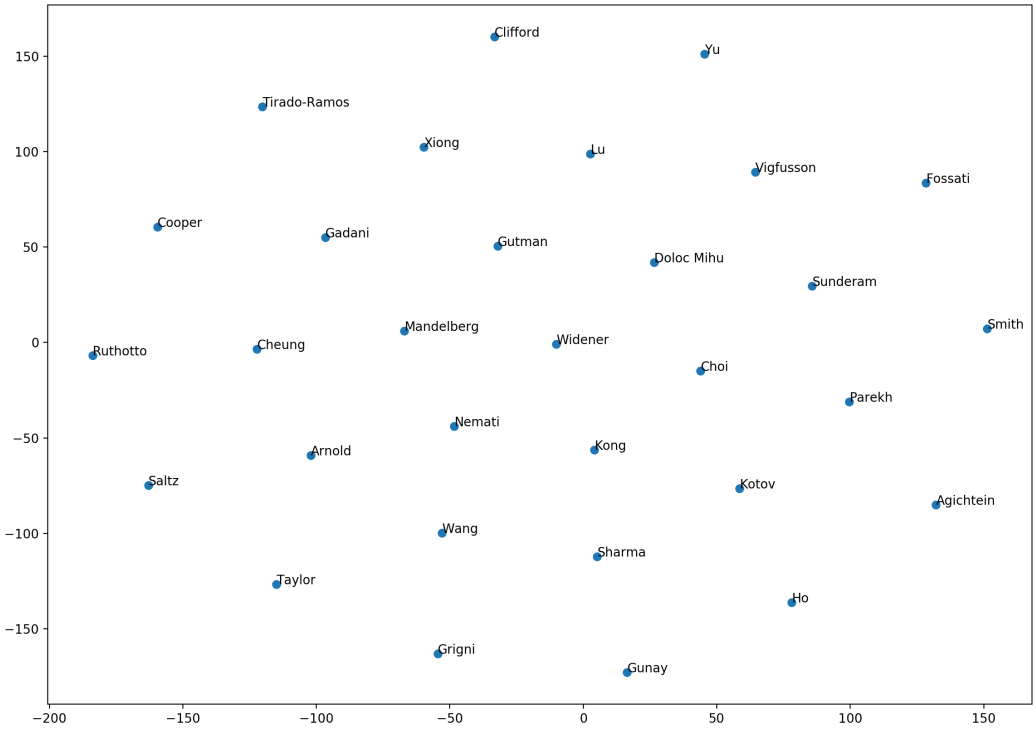
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