```
plot(allMetricsAndQuestions["numberJavaFiles"], "Java Files", "Java Files", ""
In [373]:
                                                Java Files
           7.0
           6.5
           6.0
           5.5
           5.0
           4.5
           4.0
           3.5
           3.0
                    2014
                               2015
                                         2016
                                                    2017
                                                                         2019
                                                              2018
                                                                                   2020
           plot(allMetricsAndQuestions["readability"], "Readability per Class", "", "",
In [374]:
          "")
                                          Readability per Class
           0.36
           0.34
           0.32
           0.30
           0.28
           0.26
           0.24
           0.22
                     2014
                                2015
                                          2016
                                                    2017
                                                               2018
                                                                         2019
                                                                                   2020
In [375]:
           plot(allMetricsAndQuestions["CountLine"], "Physical Lines per Class", "", "",
                                       Physical Lines per Class
           28
           26
           24
           22
           20
                    2014
                              2015
                                         2016
                                                   2017
                                                              2018
                                                                         2019
                                                                                   2020
```

```
In [376]:
          plot(allMetricsAndQuestions["CountLineCode"], "LOC per Class", "LOC per Class"
                                           LOC per Class
           21
           20
           19
           18
           17
           16
           15
                   2014
                             2015
                                        2016
                                                  2017
                                                            2018
                                                                      2019
                                                                                 2020
          plot(allMetricsAndQuestions["CountLineComment"], "CLOC per Class", "", "")
In [377]:
                                           CLOC per Class
           1.6
           1.4
           1.2
           1.0
           8.0
           0.6
                    2014
                              2015
                                        2016
                                                  2017
                                                            2018
                                                                      2019
                                                                                 2020
          plot(allMetricsAndQuestions["CountClassCoupled"], "CBO per Class", "", "")
In [378]:
                                            CBO per Class
           4.0
           3.8
           3.6
           3.4
           3.2
           3.0
           2.8
           2.6
                    2014
                              2015
                                        2016
                                                  2017
                                                                      2019
                                                                                2020
                                                            2018
```

```
plot(allMetricsAndQuestions["CountClassDerived"], "NOC per Class", "", "")
                                             NOC per Class
           0.008
           0.006
           0.004
           0.002
           0.000
                      2014
                                2015
                                          2016
                                                    2017
                                                              2018
                                                                        2019
                                                                                  2020
          plot(allMetricsAndQuestions["CountDeclMethodAll"], "RFC per Class", "", ""
In [380]:
                                             RFC per Class
           15.00
           14.75
           14.50
           14.25
           14.00
           13.75
           13.50
           13.25
                      2014
                                2015
                                          2016
                                                    2017
                                                              2018
                                                                        2019
                                                                                  2020
          plot(allMetricsAndQuestions["MaxInheritanceTree"], "DIT per Class", "", "",
In [381]:
                                             DIT per Class
           1.11
           1.10
           1.09
           1.08
           1.07
           1.06
           1.05
           1.04
           1.03
                               2015
                                         2016
                                                   2017
                     2014
                                                             2018
                                                                       2019
                                                                                 2020
```

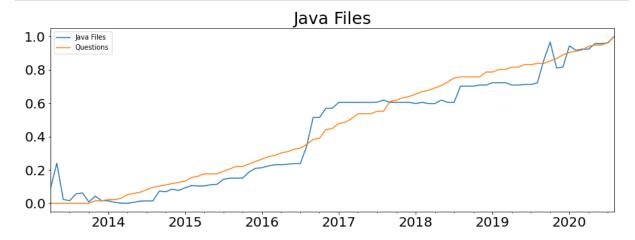
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```
plot(allMetricsAndQuestions["PercentLackOfCohesion"], "LCOM per Class", "", ""
In [382]:
                                           LCOM per Class
           16
           14
           12
           10
            8
            6
            4
            2
                    2014
                              2015
                                        2016
                                                   2017
                                                             2018
                                                                        2019
                                                                                  2020
          plot(allMetricsAndQuestions["SumCyclomatic"], "WMC per Class", "", "",
In [383]:
                                            WMC per Class
           2.9
           2.8
           2.7
           2.6
           2.5
           2.4
           2.3
           2.2
                    2014
                              2015
                                         2016
                                                   2017
                                                                        2019
                                                                                  2020
                                                             2018
          plot(allMetricsAndQuestions["CountDeclClass"], "Classes", "", "",
In [384]:
                                               Classes
           7
           6
           5
           4
                   2014
                             2015
                                        2016
                                                  2017
                                                             2018
                                                                       2019
                                                                                  2020
```

## Plotting metrics and questions

```
In [385]:
          def plot(metrics, questions, metric, title, ylabel, xlabel):
              subplot = metrics.plot(figsize=(15,5), fontsize=20, legend=True, label=met
          ric)
              subplot = questions.plot(figsize=(15,5), fontsize=20, legend=True, label=
          "Questions")
              subplot.set_title(title, fontsize=25)
              subplot.set ylabel(ylabel, fontsize=20)
              subplot.set xlabel(xlabel, fontsize=20)
                     subplot.figure.savefig(metric+".pdf",bbox_inches = 'tight')
```

plot(AllMetricsAndQuestionsNormalized["numberJavaFiles"], AllMetricsAndQuestio In [386]: nsNormalized["questions"], "Java Files", "Java Files", "", "")

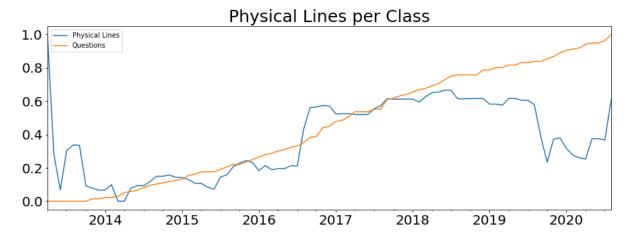


plot(AllMetricsAndQuestionsNormalized["readability"], AllMetricsAndQuestionsNo In [387]: rmalized["questions"], "Readability", "Readability per Class", "", "")

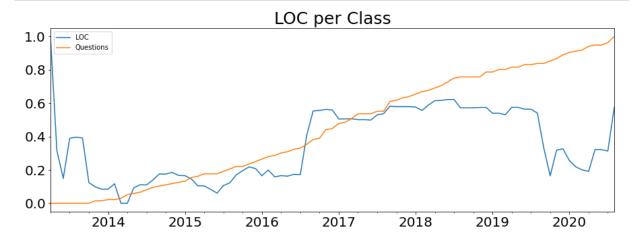


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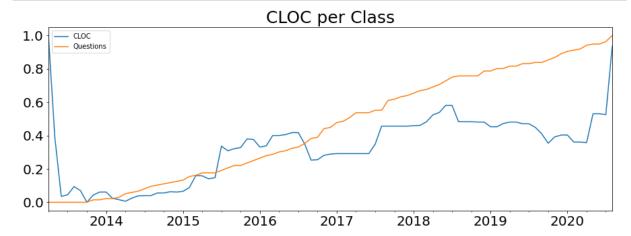
 $\verb|plot(AllMetricsAndQuestionsNormalized["CountLine"], AllMetricsAndQuestionsNormalized["CountLine"], AllMetricsAndQue$ In [388]: alized["questions"], "Physical Lines", "Physical Lines per Class", "", "")



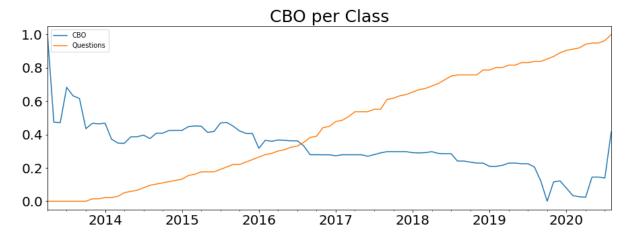
plot(AllMetricsAndQuestionsNormalized["CountLineCode"], AllMetricsAndQuestions In [389]: Normalized["questions"], "LOC", "LOC per Class", "", "")



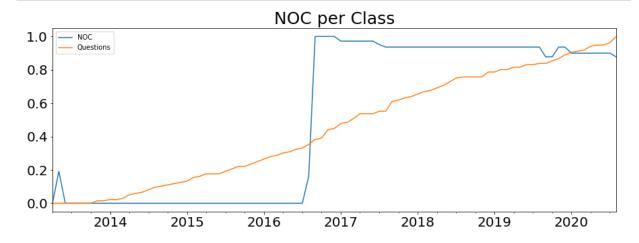
In [390]: onsNormalized["questions"], "CLOC", "CLOC per Class", "", "")



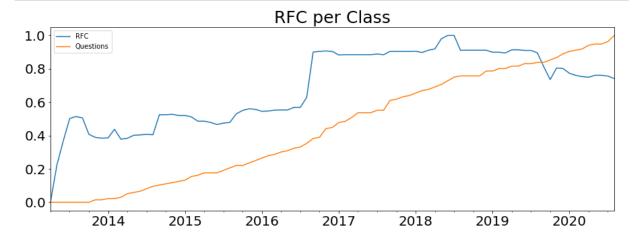
plot(AllMetricsAndQuestionsNormalized["CountClassCoupled"], AllMetricsAndQuest In [391]: ionsNormalized["questions"], "CBO", "CBO per Class", "", "")



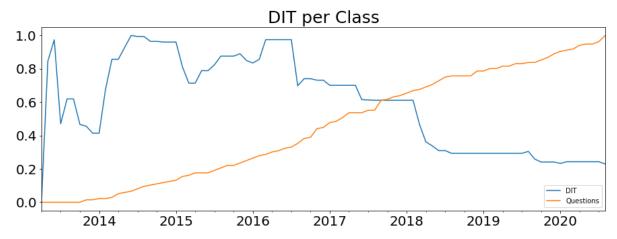
In [392]: plot(AllMetricsAndQuestionsNormalized["CountClassDerived"], AllMetricsAndQuest ionsNormalized["questions"], "NOC", "NOC per Class", "", "")



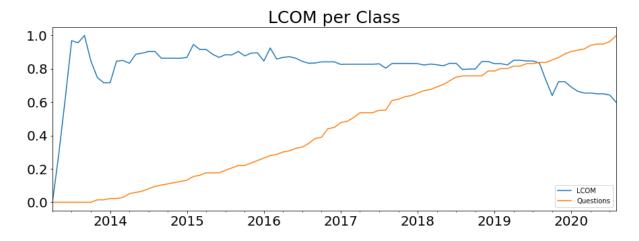
plot(AllMetricsAndQuestionsNormalized["CountDeclMethodAll"], AllMetricsAndQues In [393]: tionsNormalized["questions"], "RFC", "RFC per Class", "", "")



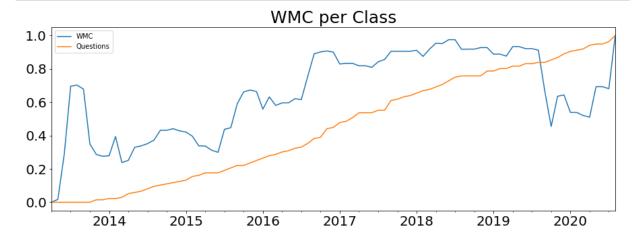
plot(AllMetricsAndQuestionsNormalized["MaxInheritanceTree"], AllMetricsAndQues In [394]: tionsNormalized["questions"], "DIT", "DIT per Class", "", "")



plot(AllMetricsAndQuestionsNormalized["PercentLackOfCohesion"], AllMetricsAndQ In [395]: uestionsNormalized["questions"], "LCOM", "LCOM per Class", "", "")



 $\verb|plot(AllMetricsAndQuestionsNormalized["SumCyclomatic"], AllMetricsAndQuestions|| \\$ In [396]: Normalized["questions"], "WMC", "WMC per Class", "", "")



plot(AllMetricsAndQuestionsNormalized["CountDeclClass"], AllMetricsAndQuestion
sNormalized["questions"], "Classes", "Classes", "") In [397]:

