Project 1, 2 and 3 will be 10 points

Project 4 will be 20 points

Final exam will be 50 points

• Project 1 – 10 Points

- You need to develop a software that has merge sort and insertion sort functions
  - Any programming language is allowed such as java, php, python, c#, etc.
- Generate 100,000 random integers between 1 and 2,000,000,000
- Put those integers into an array or a list
  - This initial list will be the seed list. Make sure this list is not get sorted itself. Always provide a copy of this list if your algorithm implementation is making on list sorting
- Sort this list both with insertion sort and merge sort algorithms (there will be 5 times sorting)
  - Before merge sort loop 1, write seed list to a file as m-seed-1.txt
  - Write merge sort loop 1 results to a file as merge-1.txt
  - Before merge sort loop 2, write seed list to a file as m-seed-2.txt
  - Write merge sort loop 2 results to a file as merge-2.txt
  - Do the same thing for 5 loop of merge sort
  - Before insertion sort loop 1, write seed list to a file as i-seed-1.txt
  - Write insertion sort loop 1 results to a file as insertion-1.txt
  - Before insertion sort loop 2, write seed list to a file as seed-2.txt
  - Write insertion sort loop 2 results to a file as insertion-2.txt
  - Do the same thing for 5 loop of insertion sort
- Calculate the exact time requirement (calculate as milliseconds) for each sorting algorithm loop
  - This can be done as starting a stopwatch or a timer before the function call and stopping the time after the function call is completed
  - Function calls can be made in a for loop

- Only calculate the algorithm function calls run time so the other things should not be calculated such as generation of random numbers or putting them into a list etc.
- Do sorting at least 5 times and take average run time to calculate each algorithms more precise run time
    - Some algorithm implementation sorts the given list itself instead of generating a new list. If your implementation also doing on list sort, make sure that you are providing a copy of the original generated random list. So you can use that list as seed list for every calculation
- Print average running times to the screen (screen depends on what software do you use, for example it can be a winform c# or a php page etc.) as milliseconds with full details
- While running, the software should print at which stage your software is such as initialization the numbers, generating the list, sorting with insertion sort loop 2, etc.
- The software you have coded will be checked and evaluated at the week 4's lesson (08.03.2018) on your computer or in a lab's computer
- So you need to bring your laptop to show or make your software work on the lab's computer and there we can check
- I ask questions about your coding
- **Prepare a report about your software coding and explain each line of code clearly**
- Also please RAR(Winrar) or ZIP(Winzip) your software (delete debug and obj folder in c# otherwise it won't allow to be attached to email) project and email to furkan.gozukara@toros.edu.tr with including your full name and your student number
- I will individually and carefully check everyone's project source code so do not try to cheat, get from your friends. Otherwise you will get very low score (both the code giving person and the cheater)
- If you fail to deliver your project at the (08.03.2018), each day passing will cause you a 1 points lower score up to 8 points out of 10