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Project Report

1. My approach was to create a single file NoThread.java for the no thread execution, then spread out the each of the functions I created in the no thread file into their own files. So, each function became a thread.
2. To check the accuracy of my program I used a valid number generator that implemented the Luhn algorithm online. This generator would generate numbers that should be valid by the check of the algorithm, and I would use it as test data within my own programs to see if my program was executing correctly. To see if it detected invalid data correctly, I modified some digits from the valid entry and tested it with an online implementation of the Luhn algorithm. Once I knew the entry was invalid, I would use it within my own program in order to see if my program was executing correctly or not.
3. In my no thread implementation, I allocated each step of the algorithm into a function. This kept my code modular and demanded less coupling. Having split everything into different functions this made calling them from my main function and creating user interaction easy. In the multi thread version of the code I turned each function into a thread, with the exception of adding the sums from step 3 and 4. That step I handled in my thread controller file and summed the results after the threads executed. Splitting the threads up like this meant that each thread was responsible for one task.
4. The first thread was responsible for taking in a card number and checking if it was a valid cart number, it would return a Boolean that was true or false depending on whether the card number was valid or not. ­­­­­The second thread took a card number as an argument and was responsible for checking what company the card was associated with. It would return a String that held the value of the company name. The third and fourth threads each took a card number executing steps three and four from the instructions respectively. They each returned an integer that held the sum value of their operations. The final thread, thread 5 was a void class so it did not return anything. Its function was to check whether the result of the sum of the numbers from steps three and four were valid and to output dialog to the console.
5. I created five methods in my NoThread.java class.