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COS 221: FUNDAMENTAL DATA STRUCTURE

HOMEWORK 4

**Overview:**

* Changes of the program are according to the homework requirements and the comments professor has made on the second homework.
* Any change from the first homework, instead of being deleted, is now made into comments for any future usage.

**Program:**

**Main cpp file:**  As my ID number is odd, I will implement the KMP search as a function.

* The search will return an integer that is the count for the number of times the pattern is found in the target string.
* There is a function to calculate the prefix table is written before the KMP function to calculate the number. The prefix and KMP function is based on the one being given as example in the lecture, works as commented.
* The KMP search function is implemented in the main function.
* The KMP search is implemented in search format to search through all the objects’ descriptions. User input the term they want to look up and the search will go through each one and give back the answer how many times can they find the pattern in each object.
* There is a loop going through each element of the spareParts vector and calculate the repeated pattern (which is the term that user is searching for) for each description, the int return from the function is stored as key into a multimap along with the spare part object, then being inserted into the map that is created above in a descending order (thanks to greater<int> in the map being created). If they cannot find it, the loop will move on to the next one.
* Then all parts are being printed out, listed by the number of times the pattern appears.