*CSE 102*

**Files - II**

1. You want to be sure that your archive of old photos and videos and stuff stays safe and intact in your secondary storage. For this purpose, you decided to write a program which checks whether there has been any change in one of the files under supervision since the last time the program was run. Obviously your program must “remember” the previous state of the files. For such purposes it’s convenient to use a hash function which maps a data of arbitrary size to a fixed and usually much smaller sized representation of it. The main desired properties of a hash function are being deterministic and the probability of two randomly picked inputs producing the same output being extremely low. Given a hash function, you can compare old and new hashes of a data to see whether the old and new versions are the same (if hashes are different, there must have been a change). You can use Java’s hashCode() method to obtain a “summary” of any object. For simplicity, assume that any individual file in your archive fits in your computer’s memory. Write this program.
2. Write a function which produces a junk file (a file with random bits) of desired size to the desired location in computer.
3. Consider the task of searching for a file given a directory. This task can be daunting if the directory has too many branches and sub-branches and so on. Write a program which takes a directory path and prepares an index file for that directory. An index file stores the mapping from file names to the corresponding absolute paths. Note that there may be more than one file with the same name under different directories in the hierarchy. Your program should load the index file upon running and then answer user queries.
4. Write a program which changes the encoding of a text file to a custom encoding provided by the user.
5. Suppose that you have a text file (encoded in ASCII) consisting only of 0 and 1 characters. Write a program which converts such files into binary files where a 0 character is represented with a single 0 bit and a 1 character is represented with a single 1 bit.