ACM Pacific NW Region Programming Contest
14 November 1998

PROBLEM A
BULK MAILING

An organization that wishes to make a large mailing can save postage by following U.S. Postal Service rules for a bulk mailing. Letters in zip code order are bundled into packets of 10−15 letters each. Bundles may consist of letters in which all 5 digits of zip code are the same (5−digit bundles), or they may consist of letters in which only the first 3 digits of zip code are the same (3−digit bundles). If there are fewer than 10 letters to make up a bundle of either type, those letters are mailed first class.

You are to write a program to read a data set of 5−digit zip codes, one per line, until end of file. The file name is **bulk.dat**. Your program should count the number of 5−digit bundles, 3−digit bundles, and first class letters. You should include as many letters as possible in 5−digit bundles first, then as many as possible in 3−digit bundles, with as few bundles of 10 to 15 letters as possible. For example, if there are 31 letters with the same zip code, they must be combined into exactly three 5−digit bundles.

Not all zip codes in the data set will be valid. A valid zip code consists of exactly 5 digits (0−9), all of which cannot be 0. Non−numeric characters are not allowed. At the end of your output, print the invalid zip codes found. (Duplicates need only be printed once.)

Print a report that lists 5−digit zip code bundles first, with the number of letters and number of bundles for each zip code. Next list all 3−digit zip code bundles with the same two counts, followed
by all zip codes that are not bundled and to be sent first class. At the end print totals of letters and bundles, followed by the number of invalid zip codes and a list of these. Single space the report, and print blank lines following the heading, before the total line, and between the three groups of zip codes. For 3−digit bundles, print the zip codes in the form dddxx, where ddd represents the three significant digits and xx represents the last two digits to be omitted. Your output should be similar to that shown in the sample.

For example (input continues on 2nd page):

SAMPLE INPUT:

```
95864
95864
95864
95867
95920
9j876
95616
95616
95747
95814
95818
95818
8976
95818
95818
95819
95819
00000
95819
95819
95819
95819
95819
95825
95825
95825
95825
95825
95826
95826
95826
95826
95826
95826
95827
8976
95833
95833
95833
95833
95819
95819
95819
95819
95833
95833
95833
95864
95864
95864
123456
95864
95864
95864
95864
```

PRODUCES THIS OUTPUT:

```
ZIP          LETTERS     BUNDLES

95819          11           1
95864          10           1

958xx          25           2

95616           2           0
95747           1           0
95920           1           0

TOTALS         50           4

INVALID ZIP CODES
9j876
8976
00000
123456
```