Stem Leaf Type Distribution Printer

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Version 1.0

1 Print example

```
        Second_Year
        N = 48
  ======================
    1 | 589
    2 | 245567889
    3 | 02256788
    4 | 00011234456666788999
    5 | 00013348
```

2 Program list

```
/*****************************************************************
 <<< leaf >>>
 Stem and leaf style distribution printer
 by Hilofumi Yamamoto, University of Tsukuba
 Version 1.0 1996.06.18
 Usage: % leaf < data_file
*****************************************************************/
#include <stdio.h>
#define MAX_LINES  60
#define BF_SIZE   256
#define MAX_DATA  100000
void stem_and_leaf(int n, int x[n]);
int main(void)
```

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```
{
  static char buffer[BF_SIZE];
  static int x[MAX_DATA];
  int n;
  n = 0;
  while(gets(buffer) != NULL){
    if(isdigit(buffer[0]) || buffer[0] == '.'){
      x[n]=atoi(buffer);
      n++;
      } else if(isalpha(buffer[0]) == 1){
        printf("\t%s\n",buffer);
      }
  }
  stem_and_leaf(n, x);
}
void stem_and_leaf(int n, int x[n])
{
  int h, i, j, k, kmin, kmax;
  static int histo[10 * MAX_LINES];
  float xmin, xmax, factor;
  xmin = xmax = x[0];                    /* 最大値最小値の初期化 */
  for (i = 1; i < n; i++)
    if     (x[i] < xmin) xmin = x[i];  /* 最小値保存 */
    else if(x[i] > xmax) xmax = x[i];  /* 最大値保存 */
  factor = 1;
  while(factor * xmax > 32767 || factor * xmin < -32767)
    factor /=10;
  for ( ; ; ){
    kmin = (int)(factor * xmin) / 10 - (xmin < 0);
    kmax = (int)(factor * xmax) / 10 ;
    if(kmax - kmin + 1 <= MAX_LINES) break;
    factor /= 10;
  }
  printf("\tN = %d\n", n);
  printf("  ======================\n");
  for (k = 0; k < 10 * MAX_LINES; k++) histo[k] = 0;
  for (i = 0; i < n; i++)
    histo[(int)(factor * x[i]) - (x[i] < 0) - 10 * kmin]++;
  if(kmin < 0 && kmax > 0){
    k = 0;
```

```
    for(i = 0; i< n; i++) if(x[i] ==0) k++;
    histo[-10 * kmin   ] -= k / 2;
    histo[-10 * kmin -1] += k / 2;
  }
  for (k = kmin; k <= kmax; k++){
    if(k != -1) printf("%5d | ", k + (k < 0));
    else        printf("   -0 | ");
    for (j = 0; j <= 9; j++) {
      if (k >= 0) h = histo[10 * (k - kmin) + j];
      else h = histo [10 * (k - kmin) + 9 - j];
      for (i = 0; i < h; i++) printf("%d", j);
    }
    printf("\n");
  }
}
```