

## **COP 3223 Program #6: Girl Scout Cookie Sales (Files and Arrays)**

**Due Date: Please Consult WebCourses**

### **Objective**

1. To give students practice in reading input from files.
2. To give students practice utilizing arrays in a program.

### **Problem: Girl Scout Cookie Sales**

You are in charge of a girl scout troop's cookie sales. For your reporting duties to the national organization, you are in charge of two things:

1. Reporting the number of boxes of cookies each girl in the troop sold.
2. Reporting the number of boxes of each TYPE that the troop as a whole sold.

You may be asked to provide these reports at various times during the cookie season.

For the purposes of this assignment, there are 11 types of cookies numbered 0 through 10. Here is a site I found with previous flavors:

<https://www.girlscouts.org/en/cookies/cookie-flavors.html>

and there are 15 girls in the troop, numbered 0 to 14. (In CS1 you'll learn how to deal with dynamically sized arrays, which is why the exact values are given in the assignment here.)

Your program should read its input from the file "cookiesales.txt" and output to standard output.

### **Input File Format (cookiesales.txt)**

The first line of the input file will contain a single positive integer,  $n$  ( $n \leq 1000$ ), representing the number of operations your program will trace through.

All operations are of two types:

1. Sale operation – one of the girls sells 1 or more boxes of 1 type of cookie.
2. Report operation – you must provide a graphical report for the national organization either about how many boxes each girl sold OR the number of each type of cookie box the troop as a whole sold.

The input file will contain  $n$  additional lines, each containing information about one operation, in the sequence they occur.

The first integer on each of these lines will either be 1 or 2, indicating whether the operation is a sale operation or a report operation, respectively.

For all sale operations, the line will be followed by three more space separated integers:  $g$  ( $0 \leq g \leq 14$ ), representing the number of the girl making the sale,  $t$  ( $0 \leq t \leq 10$ ), the type of cookie box she sold, and  $q$  ( $1 \leq q \leq 10$ ), the number of boxes she sold.

For all report operations, the line will be followed by a second integer, also either 1 or 2. The number 1 indicates a request for a report showing the number of boxes sold by each girl in the troop and 2 indicates a request for a report showing the number of each type of cookie box sold by the troop as a while.

### **Output Format**

Each report will be formatted the same exact way. The report will be a bar graph, where each star represents five cookie box sales. Below the bar graph, for clarity, the exact number of cookie boxes in that category will be shown.

To determine the number of rows your chart will have, find the maximum number of boxes that needs to be represented in the graph and divide this by 5 via integer division. Each column will represent either a girl (for type 1) or cookie (for type 2).

Here is an example of what to print for this cookie data for a type 2 query (the data in index  $i$  is the number of boxes of type  $i$  that were sold.)

[0, 12, 5, 40, 20, 8, 29, 0, 17, 2, 33]

40												*
35												*
30												*
25												*
20			*	*			*					*
15			*	*			*					*
10	*		*	*			*					*
5	*	*	*	*	*	*	*					*
0	1	2	3	4	5	6	7	8	9	10		
0	12	5	40	20	8	29	0	17	2	33		

The field width for each item printed is 5, so use "%5d" for numbers, and print spaces and stars accordingly. The row labels on the left will be positive multiples of 5, starting at 5, and the column labels on the bottom will be integers starting at 0 and ending at 10 for graphs of type 1 and 14 for graphs of type 2. The number of stars printed is simply boxes/5, using integer division, where boxes is the number of cookie boxes represented. The last row of the chart shows the raw data, in this case, the number of each type of cookie box that was sold.

Please print a full blank line after the last row (raw data) of the chart.

**Sample Input/Output**

Will be provided in a separately posted file.

**Grading Details**

No function prototypes have been given but you can only get full credit if you write functions that do reasonable logical tasks. In particular, it's recommended that you write functions that take in an array and its length and do something with that information. (A minimum of two of these functions is required for full credit.) Also, the format of the graph has been given in such a way that the same function can print out either type of graph. In order to get full credit, you must call the same function twice, for both types of graphs.

Your grade will be based on programming style, use of arrays and functions and correctness.

**Deliverables**

**Please submit a single .c file called, cookiesales.c.** Please make sure to fully comment your code, including both a header comment and internal comments.