Problem 0. Read the following Zybooks sections and solve the problems therein.
Sections 7.9, 7.11, and 7.13 by 8pm Tuesday November 8th.
Sections 8.1 to 8.4 by 8pm Thursday November 10th.

Problem 1. Write a program `binning.c` that asks the user for a range of integers of interest, a number of bins, and a set of integer data. The program then partitions the range into equal-sized bins and prints the bin ranges and the numbers of data elements that fall in each. For example, if the range is 10 to 21, there are 3 bins, and the data are 8, 12, 17, 10, and 24, then the bin ranges are 10–13, 14–17, and 18–21, and two element (10, 12) fall in the first bin, one (17) in the second, and none in the third.

All user inputs will be integers, separated by spaces. The range provided by the user is valid only if it is entered in increasing order (e.g. 11 14) and can be divided equally between the number of bins (e.g., there are 4 integers between 11 and 14, inclusive, they can be divided into 1, 2, or 4 bins, but not 3). If the user inputs numbers outside this range, these numbers are not included in any bin count.

```bash
(-)$ a.out
Range: 1 9
Number of bins: 3
Data: 3 6 3 2 9 5 4
The bins are:
1-3: 3
4-6: 3
7-9: 1

(-)$ a.out
Range: 2 5
Number of bins: 2
Data: 1 2 3 4 5 6 7 8
The bins are:
2-3: 2
4-5: 2

(-)$ a.out
Range: 3 3
Number of bins: 1
Data: -2 3 0 3 4
The bins are:
3-3: 2

(-)$ a.out
Range: 2 9
Number of bins: 3
Not a valid range!

(-)$ a.out
Range: 50 10
Number of bins: 1
Not a valid range!

(-)$
```
**Problem 2.** ECE15 is about to elect a new president! The two major party candidates are Donald and Hillary. Write a program `vote.c` that asks for the number $N$ (always $\geq 1$) of voters, and then continuously asks for the next voter, entered as “Voter X” where X is an integer, and for their candidate, entered as a single word. Voting continues until all $N$ votes have been cast, or a voting irregularity is discovered.

A voter irregularity occurs when a voter outside the range 1 to $N$ votes, or when a legitimate voter votes twice. In either case, the program declares the election to be rigged and terminates. If there are no irregularities, then once each voter from 1 to $N$ has cast their vote, the program declares the winner, and prints the vote percentages as a double with two-digit accuracy. If a vote is cast for someone other than Donald or Hillary, it is not tallied in the count. If neither Donald nor Hillary gets any votes, a new election is called.

```
(˜)$ a.out
Welcome to the ECE15 Elections!
How many people will be voting? 7
Who is voting? Voter 2
Enter candidate: Hillary
Who is voting? Voter 3
Enter candidate: Gary
Who is voting? Voter 7
Enter candidate: Jill
Who is voting? Voter 6
Enter candidate: Donald
Who is voting? Voter 4
Enter candidate: Bernie
Who is voting? Voter 5
Enter candidate: Donald
Who is voting? Voter 1
Enter candidate: Evan
The results are in!
Donald: 28.57%
Hillary: 14.29%
Donald is the next president! Make America Great Again!

(˜)$ a.out
Welcome to the ECE15 Elections!
How many people will be voting? 2
Who is voting? Voter 2
Enter candidate: Hillary
Who is voting? Voter 1
Enter candidate: Hillary
The results are in!
Donald: 0.00%
Hillary: 100.00%
Hillary is the next president! Stronger together!

(˜)$
```
Welcome to the ECE15 Elections!
How many people will be voting? 2
Who is voting? Voter 2
Enter candidate: Donald
Who is voting? Voter 1
Enter candidate: Hillary
The results are in!
Donald: 50.00%
Hillary: 50.00%
Constitutional stalemate! New elections to be held during Final!

Welcome to the ECE15 Elections!
How many people will be voting? 4
Who is voting? Voter 3
Enter candidate: David
Who is voting? Voter 1
Enter candidate: Hannah
Who is voting? Voter 4
Enter candidate: Venkatesh
Who is voting? Voter 2
Enter candidate: Yao
The results are in!
Donald: 0.00%
Hillary: 0.00%
Constitutional stalemate! New elections to be held during Final!

Welcome to the ECE15 Elections!
How many people will be voting? 3
Who is voting? Voter 1
Enter candidate: Hillary
Who is voting? Voter 1
Enter candidate: Donald
This election is rigged!
Welcome to the ECE15 Elections!
How many people will be voting? 2
Who is voting? Voter 3
Enter candidate: Hillary
This election is rigged!
Welcome to the ECE15 Elections!
How many people will be voting? 2
Who is voting? Voter 0
Enter candidate: Donald
This election is rigged!

Problem 3. Write a program `draw.c` that asks the user for the size of a square grid and then for a sequence of move directions: ‘U’ or “up” and ‘R’ for “right”. The program then prints the path that starts at the bottom left corner of the grid and follows the directions given by the user. If the path reaches either the top or right boundaries of the grid all subsequent directions are ignored.

You may assume that the directions will always be either ‘U’ or ‘R’, with no other characters in between, and that the number of directions will be at most 3 times the size of the grid. If the grid size is 0 or less, print an Invalid size message.

```bash
(-) $ a.out
Grid size:.6
Instructions:_UURURR
|   |   |   |   |
|   |   |   |   |
|   |   |   |   |
|X|X|X|   |
|X|   |   |   |
|X|   |   |   |
|X|   |   |   |

(-) $ a.out
Grid size:.4
Instructions:_RRRUU
|   |   |   |
|   |   |   |
|   |   |   |
|X|X|X|X|

(-) $ a.out
Grid size:.3
Instructions:_UURUR
|   |
|X|   |
|X|X|   |
|X|   |   |

(-) $ a.out
Grid size:.1
Instructions:_RRURR
|X|

(-) $ a.out
Grid size:-1
Invalid size!

(-) $
```