COP 3223 Program #2: UCF Football

Program A: Field Goal Distance (fieldgoal.c)

The actual distance a field goal must be kicked differs from the number of yards the ball is away from the goal line. For those not initiated into the ways of football, this is confusing!

Consider the following example: if the ball is on the 30 yard line, 30 yards away from the end zone, to give the kicker some extra room, he actually kicks the ball from 7 yards behind where the ball starts, so from the 37 yard line. Then, the uprights he has to kick the ball through are actually 10 yards behind the end zone. Thus, a field goal for a team lined up 30 yards away from the end zone is actually a 47 yard field goal!

For this problem, ask the user how far away the team is from the end zone in yards, and print out the actual distance the field goal must be kicked.

Sample Program Run (User Input in Bold and Italics)

```
How far away from the end zone is your team, in yards?
30
Your field goal will be 47 yards from that spot.
```

Sample Program Run (User Input in Bold and Italics)

```
How far away from the end zone is your team, in yards?
46
Your field goal will be 63 yards from that spot.
```

Program B: Cheerleaders (cheerleaders.c)

UCF wants its fans to be able to see the cheerleaders at the game! To this end, the cheerleaders space out equally across all four sides of the field. For the purposes of this question, the field is a rectangle. For each of the sides, one cheerleader is placed at the "beginning" of the side, and then the next cheerleader is placed S yards down the side from the previous cheerleader. This continues all the way down each of the four sides until the side is covered. For example, if one side of the field is 100 yards, and we place a cheerleader every 13 yards, a total of 8 cheerleaders will be placed on that side of the field at the yard markers 0, 13, 26, 39, 52, 65, 78 and 91 from the original spot that the first cheerleader is placed. Had cheerleaders been placed every 10 yards, then a total of 11 would be placed. Note that in this scenario, there would be two cheerleaders placed at the ending corner, because the placement of cheerleaders for the adjacent side would start at marker 0, which is the same location as marker 100 for the previous side.

For this problem, given the length and width of the football field in yards, as long as the desired spacing of cheerleaders, determine the number of cheerleaders that must be placed to cover all four sides of the rectangle.

Note: You must use integer division to get full credit for this problem.

Sample Program Run (User Input in Bold and Italics)

```
What is the length and width of the field in yards?
100 53
How many yards of spacing between cheerleaders?
10
You will need 34 cheerleaders to cover all 4 sides of the field.
```

Sample Program Run (User Input in Bold and Italics)

```
What is the length and width of the field in yards?
250 70
How many yards of spacing between cheerleaders?
30
You will need 24 cheerleaders to cover all 4 sides of the field.
```

Sample Explanation: For the first example, each long side will have 11 cheerleaders on the markers 0, 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100. Each of the short sides will have 6 cheerleaders on the markers 0, 10, 20, 30, 40 and 50. Thus a total of 11 + 6 + 11 + 6 = 34 cheerleaders are needed to cover all four sides.

In the second sample, 9 cheerleaders are needed to cover each long side and 3 cheerleaders are needed to cover each short side.

Program C: Football Ticket Cost (tickets.c)

Your family is thinking about buying some UCF season tickets for football. The season consists of several games, and for each game, your family will buy the same number of seats, each of which costs a particular price. In addition, for every four people in the order, UCF requires that you buy a parking pass. Each of the parking passes lasts for the whole season. Finally, a required 6.5% sales tax is added to the total order.

Write a program that reads in from the user the number of games for the season, the number of seats you want to buy, the cost in dollars per seat, as well as the cost of a single parking pass for the year, and prints out the total cost, including tax, for the entire purchase.

Note: You must use integer division to get full credit for this problem and you must define and use appropriate constants for full credit.

Sample Program Run (User Input in Bold and Italics)

```
How many home games in the football season?
6
How many seats do you want to buy for each game?
5
What is the cost of a single ticket for one game, in dollars?
88.25
How much is a single parking pass for the season, in dollars?
199.99
Your grand total will be $3245.57.
```

Sample Explanation: You are buying a total of 30 tickets over the 6 games, each which costs $88.25. This means the total ticket cost is $2647.50. In addition, with 5 people, you are required to buy 2 parking passes, each costs $199.99, so the total parking cost is $399.98. Adding these two values we get a pre-tax cost of $3047.48. The tax that gets added to this total, which is 6.5% of it, turns out to be $198.09, rounded to the nearest penny. Adding the tax in, we get a grand total of $3245.57.

Deliverables

Please submit three separate .c files for your solutions to these problems via WebCourses by the designated due date:

Program A: **fieldgoal.c**
Program B: **cheerleaders.c**
Program C: **tickets.c**

Please make sure to include a header comment and internal comments in your code and indent when appropriate.