

# Assignment 3

Due Feb. 15

February 9, 2022

## Instructions

For this assignment, you should write a Python script that solves the problem described below. The first line of your file should contain a comment stating:

The code for this project represents my own, independent work. I have neither given nor received help on this assignment from other students.

Add another comment with your name after this comment.

**Important:** I strongly recommend you read the lab before Friday and aim to complete it at least 1 day (24 hours) before it is due, especially if you had trouble with Assignment 2.

## Description

Expand on your solution to Assignment 2 to write a Python script to calculate the contestant who has won the One Bid game among an *arbitrary* number of contestants. As before, the winner will be the contestant who bid the most money without going over the true price of the prize, and you do not need to check for (or solve) situations where two contestants are bidding the same amount of money.

## Input

Your program should first prompt the user for the true price of the prize, then the number of contestants. Then, it should prompt the user to enter bids for each of these contestants, one at a time. Your program should use prompts similar to the following:

- What is the true price of the prize?
- How many contestants are playing today?
- What is the bid for Contestant 1?
- What is the bid for Contestant 2?

- What is the bid for Contestant 3?
- ...

Each prompt should have a space after the question mark. As before, the user should enter whole dollar amounts (integers) in response to each question.

## Output

Your program should either print the message “All contestants have overbid!” or the message “Contestant X wins” (where you should replace X with the winning contestant).

## Sample test cases

The table below gives a few cases for you to test your code against.

True Price	Number of contestants	Bids	Winner
50	4	100, 200, 300, 400	None (all overbid)
150	2	100, 200	1
150	2	200, 100	2
500	3	200, 300, 100	2
625	7	800, 600, 1, 2, 750, 601, 1000	6

## Hints

Since the number of contestants is variable, you cannot solve the problem by listing out all of the possibilities in if statements. Instead, you will want to use a strategy based on keeping track of the current winner (out of all contestants whose bids have been entered so far) and updating this until you can report the true winner at the end. This strategy is somewhat similar to how we calculated the maximum value in an in-class exercise.

You may find it helpful to use the following 3 variables to solve the problem:

- **everyone\_overbid**: a Boolean variable that is True if (and only if) everyone’s bid is too high
- **winning\_contestant**: a number indicting which contestant has bid the closest to the true value without going (over only defined when **everyone\_overbid** is False)
- **winning\_bid**: the value bid by the winning contestant (only defined when **everyone\_overbid** is False)

Consider what value you should set these variables to initially and how they should be updated as the user enters in the bid for the next contestant. Once all bids have been entered, you should be able to output the correct result based on these variables.