In The Name of God


Fundamentals of Computer Programming

Assignment #6

Due Time: November 29, 2016, 23:55

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1. **Guess the number**

   Write a python program that guess the number user has selected. At first, the program gets a positive integer n from user. User selects a number k (1 <= k <= n) in his mind. The program guesses a number g and prints g. Then user should enter 1, 0 or -1. 1 means k is greater than g, -1 means k is lower than g and 0 means k is equal to g. The program continues guessing until k is equal to g (that means finding the number) and prints the number.

   **Example:**

   Enter n: 15

   8

   1

   12

   -1

   10

   -1

   The number is 9

   **Example**

   Enter n: 100

   50

   0

   The number is 50

***Note that the inputs in q2 and q3 are parameters of the functions.**

2. **A)** Define a function that takes a number n as parameter and prints “1 2 3 … n … 3 2 1”.

```
Input:

>>> 4


Output:

 1 2 3 4 3 2 1
```

**B)** Define a function that takes a number n as parameter and prints “ “ n times. (“ “ is space character).

**C)** Define a function that takes a number n as parameter and uses the above functions to draw a numeric rhombus like the example below.

```
Input:

>>> 4


Output:

       1
     1 2 1
   1 2 3 2 1
 1 2 3 4 3 2 1
   1 2 3 2 1
     1 2 1
       1
```

3. An experiment is defined as follows:
   Drop a ball from an initial height and calculate the total distance traveled by the ball after a certain number of bounces. The bounciness of the ball determines how high it bounces when dropped from a particular height. For example, a ball with bounciness of 0.5, will bounce 5 feet high after being dropped from a height of 10 feet.
   Define a function that takes three inputs: the initial height, the bounciness of the ball and number of bounces. The return value of the function should be the total distance traveled by the ball.

Input:

10, 0.5, 2

Output:

22.5 #Note: 10 + 5 + 5 + 2.5

Input:

20, 0.2, 3

Output:

29.76 #Note: 20 + 4 + 4 + 0.8 + 0.8 + 0.16