# Solution Review: Convert Decimal Integer to Binary

This lesson contains the solution review for the challenge of converting integer values to their binary equivalents.

**We'll cover the following**



Let's analyze the solution to the exercise in the previous lesson.

## Implementation #

```
def convert_int_to_bin(dec_num):
    s = Stack()

    while dec_num > 0:
        remainder = dec_num % 2
        s.push(remainder)
        dec_num = dec_num // 2

    bin_num = ""
    while not s.is_empty():
        bin_num += str(s.pop())

    return bin_num

print(convert_int_to_bin(56))
print(convert_int_to_bin(2))
print(convert_int_to_bin(32))
print(convert_int_to_bin(10))

print(int(convert_int_to_bin(56),2)==56)
```

## Explanation #

On **line 2**, we declare a stack and proceed to a `while` loop on **line 4** which executes if `dec_num` is greater than 0.

As stated in the **division by 2** method, we calculate the remainder of the division of `dec_num` by 2 and push it onto the stack (**lines 5-6**). Then we divide `dec_num` by 2 using the `//` operator to `dec_num` which floors the answer of the division, and we update `dec_num` with the answer (**line** 7). We keep executing the code on **lines 5-7** as long as `dec-num` is greater than 0. As soon as `dec_num` becomes equal to or less than 0, the `while` loop terminates.

On **line 9**, `bin_num` is declared as an empty string. The `while` loop on the very next line executes if the stack `s` is *not* empty. If `s` is not empty, we pop a value from `s` and append it to the `bin_num` string on **line 11**. We keep popping elements from `s` until it becomes empty and the `while` loop is terminated.

The `bin_num` is returned from the function on **line 13**.

The following code helps us to evaluate whether our implementation is correct or not:

```
print(int(convert_int_to_bin(56),2)==56)
```

The above statement will print `True` if `convert_int_to_bin(56)` returns the correct binary equivalent for `56`. We convert the returned value from `convert_int_to_bin(56)` to an integer value by specifying base `2` of the returned value. It will convert to `56` if it's equal to `56` in binary format. Otherwise, the statement will print `False` if we get some number other than `56`.

In this problem, the *First-In, Last-Out* property of the stack has enabled us to store the binary bits from the *MSB* (Most Significant Bit) to the *LSB* (Least Significant Bit), although we get the values in reverse order by the *division by 2* method.

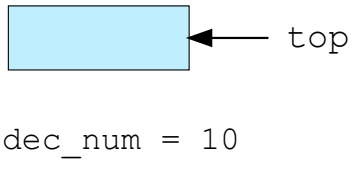
Below are some slides that will help you understand the code even better:

```
def convert_int_to_bin(dec_num):
    s = Stack()

    while dec_num > 0:
        remainder = dec_num % 2
        s.push(remainder)
        dec_num = dec_num // 2

    bin_num = ""
    while not s.is_empty():
        bin_num += str(s.pop())

    return bin_num
```




dec_num = 10

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Hope everything's clear up until now! We'll now move on to the next chapter which is all about Singly Linked Lists.