

# Mathematics 3670: Lab 3 Hints + Python Tips

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## Iterating over a list in Python

```
# Establish a sample list of values
```

```
A = [10, 20, 30, 40, 50, 60, 70]
```

```
# Obtain all the legal index values for A
```

```
indexValues = range(len(A))
```

```
# Process the elements of A, in left-to-right order
```

```
for i in indexValues:
```

```
    print(A[i])
```

```
# Process the elements of A, in right-to-left-order
```

```
indexValues.reverse()
```

```
for i in indexValues:
```

```
    print(A[i])
```

## Generating a list of the appropriate size

```
def add(A, B):  
    """  
    Performs binary addition on the bit strings A and B,  
    yielding the sum.  Assumes both arguments have the  
    same number of bits.  
    """  
  
    # Create a list of 0's of the correct size  
    sum = len(A) * [0]  
  
    # Perform the addition, saving the bits in sum  
  
    ... INCOMPLETE ...  
  
    return sum
```

# Thinking about binary addition

One stage involves adding two bits and a carry:

$$x + y + c$$

where  $x$ ,  $y$ , and  $c$  are bits. From these three bits, we need a **sum** bit and a **carry** bit to pass on to the next stage.

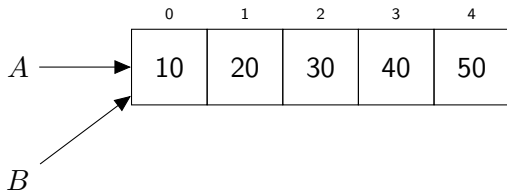
$x$	$y$	$c$	carry	sum
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

The Python `/` and `%` operators are made to order for this task!

# The assignment operator used with lists

```
A = [10, 20, 30, 40, 50]
```

```
B = A
```



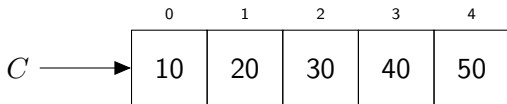
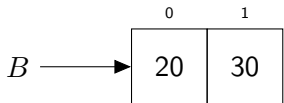
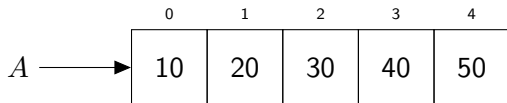
Be careful ... making a change to A also changes B!

# The Python “slice”

```
A = [10, 20, 30, 40, 50]
```

```
B = A[1:3]
```

```
C = A[ : ]
```



B and C are **copies** of a slice of A — a subsequent change to A leaves B and C unchanged.