• Loops
  o While timeremaining(#)
    ▪ For # seconds do body
  o For <i> in <list>
    ▪ <i> represents index
    ▪ List can be anything in any order you desire
    ▪ Range(n)
      □ List of n numbers starting at 0
    ▪ Range(x,y)
      □ List of numbers of from x to y exclusive
    ▪ Range(x,y,z)
      □ List of numbers from x to y that increment by z
    ▪ Parameters in range command can be variables if variables are previously defined

• Population Program

```python
def main():
    population = input("Please enter population as of Jan 1st, 2009: ")
    children = 1.14/100*population
    newpopulation = population + children
    print "The world population at the end of 2009 will be", newpopulation
```

• Can we rewrite program to calculate population for any year?

```python
def main():
    population = 6650000
    year = input("Please enter year")
    for i in range(2009, year+1):
        children = 1.14/100*population
        # population is a self updating variable and is overwritten with each iteration of the loop
        population = population + children
        # print population at each iteration of the loop
        # for the year to correspond with the correct population the correct year is actually i
        print i, population
```

• Calculating the sum for the first n integers

```python
def mysum(n):
    bncsum = 0
    for i in range(1, n+1):
        # the sum at each iteration is the previous sum plus i
        bncsum = bncsum + i
    print i, bncsum
```

• Store the value obtained from previous iteration for current iteration

<table>
<thead>
<tr>
<th>Iteration</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1+i</td>
</tr>
<tr>
<td>2</td>
<td>3+i</td>
</tr>
<tr>
<td>3</td>
<td>6+i</td>
</tr>
</tbody>
</table>

• Lists
  o Operations can be performed on lists

    >>> [2,"abc",-1]+["bmc",1000]
    [2, 'abc', -1, 'bmc', 1000]
    >>> [1,2]*3
    [1, 2, 1, 2, 1, 2]
    >>> i=[1,2]
    >>> print i
    [1, 2]
    >>> 12=1+1
    >>> print 12
    [1, 2, 1, 2]
  o Can call specific items from a list
    ▪ Listname[index]
    ▪ Len(listname)
      □ Length of listname
    ▪ Strings are lists
Variables can be used in the calling of items in a list

```python
>>> str="Hello, world!"
>>> print str[0]
H
>>> print str[10]

1
```