

• Loops

- While timeremaining(##)
  - For ## seconds do body
- 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

```
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?

```
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 updatdng 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

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

- Store the value obtained from previous iteration for current iteration

Iteratio n	Sum
1	1+i
2	3=1+i
3	6=3+i

• Lists

- 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]
>>> l=[1,2]
>>> print l
[1, 2]
>>> l2=l+1
>>> print l2
[1, 2, 1, 2]
```

- Can call specific items from a list

- Listname[index]
- Len(listname)
  - Length of listname
- Strings are lists

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

- Variables can be used in the calling of items in a list

```
>>> x=0
>>> print str[x]
H
>>> print str[x+1]
e
>>> print str[x+10]
l
```