CPSC 203
Problem Solving

Week 3 Lab1
Review

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Preparing for the Quiz

- You will be required to write program from scratch
- Try to solve the programs taught in the lab without looking to the answers
- You will be required to correct mistakes in program
  - Syntactic mistakes such as
    - The missing of ":" in the end of a for loop
    - print 'hi'
    - Def printName()
    - elseif:

Preparing for the Quiz

- You will be required to correct logical mistakes
  - This means the program has no errors in JES but the output is not as desired.
    - Sum or count has not been initialized
    - A program that is supposed to find even numbers has the following condition
      - if (i%2!=0):
        - print i is "even"
    - A program that is supposed to print a sum of a list
      - for i in S:
        - Sum=sum+i
        - print Sum

Example

- Write a function that accepts a number x as a parameter and checks if this number if positive, negative, or zero

Think before looking to answer

```
def check(x):
  if (x>0):
    print "Positive"
  elif (x<0):
    print "Negative"
  else:
    print "Zero"
```


For loop

modify the previous program to accept a list of numbers. Do a for loop to check whether each number in the list is positive, negative, or zero

Test your program with check([-4,7,0,-1,9])


```
def check(list):
  for x in list:
    if (x>0):
      print "Positive"
    elif (x<0):
      print "Negative"
    else:
      print "Zero"
```


Example

- Modify the previous program to count the number of positive numbers in the list

```
def check(list):
  count=0
  for x in list:
    if (x>0):
      count=count+1
  print "No. of positive numbers is ",
count
```


Mod operation

- The result in the reminder of the division
  - 10%2= 0
  - 11%2 =1
  - 15 % 3 =0
  - 17 % 3 = 2
  - 16 % 3 = 1
  - To know if y is divisible by x, check if y % x =0
  - X is even if x % 2=0
  - X is odd if x% 2 =1

Check a list for even and odd

```
def printEven(S):
  if empty(S):
    return "Empty"
  for i in S:
    if i%2==0:
      print i, " is even"
    else:
      print i, " is odd"
```


Exercise

- Make a program to find the summation of odd elements in a list S
- Make a program to find the multiplication of elements in a list S which are multipliers of 3 and odd

Lists, let S=[1,5,1,2]

- append(x): add an item x to the end of a list
  - e.g. S.append(3) → S=[1,5,1,2,3]
- insert(i,x): insert an item x in the position i
  - e.g. S.insert(1,9) → S=[1,9,5,1,2,3]
- remove(x): remove the first item from the list whose value is x
  - e.g. S.remove(2) → S=[1,9,5,1,3]
- index(x): returns the index of the first item whose value is x
  - e.g. S.index(5) → 2
- count(x): returns the number of times x occurs in the list
  - e.g. S.count(1) → 2

Example

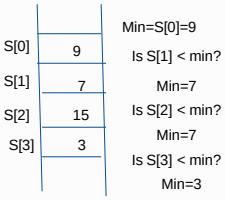
- Write a program that searches for an item x in a specific list S and replace it with y

```
def search(S, x, y):
  xIndex= S.index(x)
  S.remove(x)
  S.insert(xIndex,y)
  for i in S:
    print i
```

Test your program with search([10,3,5], 3, -1)

Find the Min element in a list

```
def getMin(S):
  if len(S)==0:
   return "Empty"
  min_so_far=S[0]
  for i in range(1, len(S)):
    if  S[i] < min_so_far:
      min_so_far = S[i]
  return min_so_far
```



Find the Max in a list

```
def getMax(S):
  if len(S)==0:
   return "Empty"
  max_so_far=S[0]
  for i in range(1, len(S)):
    if  S[i] > max_so_far:
      max_so_far = S[i]
  return max_so_far
```

Sorting a list

```
def selectionSort(S):
    sortedS = []
    for i in range(0,len(S)):
            minElement = min(S)
            S.remove(minElement)
            sortedS.append(minElement)
    return sortedS
```