CPSC 203 Problem Solving Week 2 Lab1 Loops and Conditions Dina A. Said dasaid@ucalgary.ca

Review

Define a function def functionName():

Define a variable

Display a variable print x

Display a constant print "Hello"

Review

- Display a constant and a variable print "My name is:", myName
- To execute a function, type in the black box functionName()

Review

- Make a function called Square that:
 - 1. Sets the length of the square to be 6
 - 2. Calculates the Area of the square (length*length)
 - 3. Calculates the perimeter of the square (4*length)
 - 4. Displays a message
 - For a Square with length, area=, Perimeter=....

Solution

```
def Square():
length=6
area=length*length
Perimeter=4*length
print "For Square with length", length, "Area=", area,
"Perimeter=", Perimeter
```

• What if I want the user to enter the length of the square? def Square(length):

area=length*length

Perimeter=4*length

Now, you can call your function with multiple lengths such as: Square(7), Square(8.5), etc...

This is called Parameter Passing

Note: For passing a string, you should use quotes e.g.

def printName(myName):

print myName.

This function is called using: printName("Dina")

Exercise

- Make a function called myCircle that:
 - 1. Define r as 10.5
 - 2. Define pi as 3.14
 - 3. Calculate the area of the circle (A) as pi*r*r
 - 4. Calculate the perimeter of the circle (P) as 2*pi*r
 - 5. Print the following message
 - "For a circle with radius ..., area=... and perimeter=...."
 - You should replaced the dots before with the radius, calculated area, and calculated perimeter
 - 6. Use parameter passing concept to enable the user to pass the values of r and pi

If-else condition

```
if test1:)
    statements1
    elif test2:
    statements2
    else:)
    statements3
```

IMP:

• For equal test, you must use "== "e.g. if x==y

Example

- Make a function that compares two numbers x, y and prints "Equal" if x=y, "larger" if x>y, and "smaller" if x<y.
- Try testing using compare(6,7), compare(7,9), compare(0,0)

```
def compare(x,y):
  if x==y:
    print "Equal"
  elif x>y:
    print "Larger"
  else:
    print "Smaller"
```

Exercise

• Modify your square function to check first if the length is greater than 0. In case that, it is less than or equal 0, your function should print an error message and it shouldn't calculate the area or the perimeter.

Answer

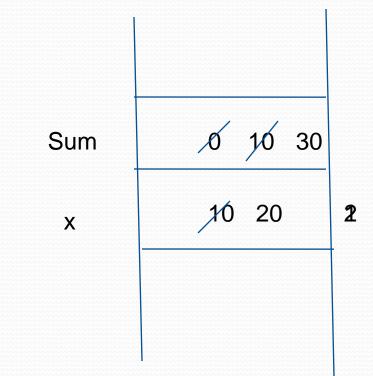
```
def square(length):
 if length<=0:
  print "Error, length should be greater than 0"
 else:
  area=length*length
  perimeter=4*length
  print "For a Square with length", length, "Area=", area,
  "Perimeter=", perimeter
```

• Now, modify myCircle() function to check for the radius and pi values and ensure that they are greater than 0.

LOOPS

- If I have an array (10,20,30,40,50)
 - How to sum these numbers?

def myLoop():
 Sum = 0
 for x in [10,20,30,40,50]:
 Sum = Sum + x
 print Sum



Loops

for target in object : statements

IMP:

Every statement indented after the loop is executed in every iteration of the loop

Example

 Modify the previous program to print the sum of each iteration in the loop

While Loop

```
while condition-is-true:
       statements
Example:
def function whileLOOP():
   x=5
   while x>0:
     print x*x
```

x=x-1

```
x=5 \rightarrow 25

x=4 \rightarrow 16

x=3 \rightarrow 9

x=2 \rightarrow 4

x=1 \rightarrow 1

x=0 \text{ STOP}
```

Try removing x=x-1

Notes:

- $\mathbf{x}=\mathbf{x}+\mathbf{1} \rightarrow \mathbf{x}+=\mathbf{1}$
- $\mathbf{x}=\mathbf{x}-\mathbf{1} \rightarrow \mathbf{x}-\mathbf{1}$
- $x=x*2 \rightarrow x*=2$
- $x=x/10 \rightarrow x/10$