

### Vocabulary

|                |                               |
|----------------|-------------------------------|
| variable       | something that can change     |
| string         | a list of characters          |
| integer        | pos/neg natural numbers       |
| number         | and zero                      |
| floating point | decimal number                |
| length         | the length of the string      |
| Modulo         | Finds the remainder           |
| Boolean        | True/False                    |
| Syntax         | Grammar/Structure of language |
| range (1,10)   | the numbers 1-9               |
| range(10)      | the numbers 0-10              |

### Conditionals

|                               |                                                                                                        |
|-------------------------------|--------------------------------------------------------------------------------------------------------|
| If.....                       | If the statement is true then do                                                                       |
| :then.....                    | command under then else do                                                                             |
| else.....                     | command under else                                                                                     |
| while.....                    | While <b>this</b> is true loop the command under the conditional                                       |
| While True                    | loops forever                                                                                          |
| for each item in name of list | For every item in the list repeat the command under the loop that many times. (a string is a list too) |

### Naming Conventions

#### Rules for naming variables:

- letters
- numbers
- underscores (\_)
- can start with **letters** or **underscores** ONLY
- NO SPACES

#### Valid names:

- \_mystr
- my3
- Hello\_there

#### Invalid names:

- 3my= "hi" -- cannot start with number
- first name = "hi" -- no spaces allowed
- first-name -- dashes are not accepted

### Lists

```
#this is how you make a list in python
shoppinglist = ['coke zero', 'bacon', 'water', 'jelly', 'gummy bears']
print (shoppinglist)
print (shoppinglist[0])
#prints the first item of the list
list_num = 0
while list_num < len(shoppinglist):
    print ("List: ", shoppinglist[list_num])
    list_num = list_num + 1

#for loop--> same as the above
#For every item in that list we're going to print it.
for item in shoppinglist:
    print (item)
numbers = range(1,5)
#print up until less than the last number.
for item in numbers:
    print (item)
# a string is a list of characters, letters, numbers, etc.
mystr = "hello"
for letter in mystr:
    print (letter)
```

### Adding strings number

```
mystring = ""
count = 0
while count < 5:
    mystring = mystring + str(count)
    print (mystring)
    count = count + 1
```

### Symbols

### Symbols (cont)

|       |                                                              |
|-------|--------------------------------------------------------------|
| //    | divide and quotient is integer                               |
| **    | exponent                                                     |
| %     | modulo: the remainder                                        |
| [...] | The position of the item in the list or the letter in a word |

### Multiplication & Exponents

|                  |                                    |
|------------------|------------------------------------|
| string * string  | CRASH!!!                           |
| string * number  | combines the strings multiple time |
| number * number  | math (multiply)                    |
| string ** number | CRASH!!!                           |
| number ** number | Exponent(Math)                     |
| string ** number | CRASH!!!                           |

### Even/odd using counters

```
even_value = 0
odd_value = 0
while True:
    use_r_input = input("Enter a positive number: ")
    number = int(use_r_input)
    if number < 0:
        print ("There were ", even_value, "even numbers and there were ", odd_value, "odd numbers.")
        break
    if number % 2 == 0:
        even_value = even_value + 1
    else:
        odd_value = odd_value + 1
```

### Addition

|                 |                        |
|-----------------|------------------------|
| string + string | squishes them together |
| string + number | crash                  |
| number + number | math(addition)         |

### Area of circle

|    |                              |
|----|------------------------------|
| == | equal to                     |
| != | not equal to                 |
| <  | less than                    |
| <= | less than or equal to        |
| >  | greater than                 |
| >= | greater than or equal to     |
| +  | add                          |
| -  | subtract                     |
| *  | multiply                     |
| /  | divide and quotient is float |

```
def areaofCircle(r):  
    if r <= 0:  
        return " Error:  
invalid radius "  
  
    pi = 3.1415
```



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### Area of circle (cont)

```
> area = pi/(r*2)
return (area)
user_radius = input('Enter the radius: ')
radius = float(user_radius)
print("The area of the circle is", areaofCircle(radius))
```

### fibonacci

```
num1= 0
num2=1
mystr = '0'
while num1 + num2 < 89:
    Fibonacci = num1 +num2

    num1= num2

    num 2=F ibo nacci
    mystr= mystr+ " , " +
str(num1)
print (mystr)
```

### Functions

### Functions

|         |                                                                                                                                                                    |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| print() | displays information on the screen                                                                                                                                 |
| input() | receives info from the user                                                                                                                                        |
| int()   | converts the value into an integer                                                                                                                                 |
| str()   | converts the value to a string                                                                                                                                     |
| float() | converts the value to a floating point                                                                                                                             |
| len()   | The length of the string                                                                                                                                           |
| #       | One line comment not include in code                                                                                                                               |
| """     | Multi-line comment                                                                                                                                                 |
| def     | defines a block as in subbing the name for lines of commands. The variable in the parentheses can be replaced by inputing the desire value into those parentheses. |
| range   | range of numbers from 0 to one less then that.                                                                                                                     |

### Spelling a string out in reverse code

```
word = input("Type in a word: ")
reverse = " "
for letter in word:
    reverse = letter +
reverse
print ("Re verse: ", reverse)
```

### This prints the true or false value using boolean

```
print(True)
print (2<3)
print (2 != 2)
```

### Countdown Code

```
user_number = input("Please enter a number: ")
number = int(us er_ number)
countd own _string = " "
while number > 0:
    cou ntd own _string =
countd own _string + " " +
str(nu mber)
    number = number-1
print (count dow n_s tring)
```

### palindrome and efficient loops

```
def isPali ndr ome (word):

    let ter_num =0
    while letter_num <
len(wo rd) -1- let ter _num:

        if word[l ett -
er_num] == word[l en( wor d)- 1-
l ett er _num]:

            let -
ter_num = letter_num +1

        else:

            return
False

    return True

while True:

    use r_input = input( " -
Please type in a word: ")
    if user_input == " qui -
t":

        break

    #print (isPal ind rom -
e(u ser _in put))
    myvalue = isPali ndr -
ome (us er_ input)
    if myvalue == True:

        print (user_ -
input + " is a palind rom e.")
    elif myvalue == False:

        print (user_ -
input + " is not a palind rom -
e.")
```

### list loops #2

```

def calc(num1, num2, operation):

    if operation == " sum ":
        return sum(num1,
num2)
    elif operation == " pro -
duc t":
        return produc -
t(num1, num2)
    elif operation == " dif -
f":
        return
diff(num1, num2)
    elif operation == " -
div ":
        return div(num1,
num2)

def sum(a, b):
    return a+b
def product(a, b):
    return a*b

def diff (a, b):
    return a-b

def div(a, b):
    if b == 0:
        return ("Er -
ror ")
    elif b != 0:
        return a/b

print (calc( 1,2 ,"su m"))
print (calc(4,2, " dif f"))
print (calc (9,0, " div "))
print (calc (2,12, " pro duc -
t"))
calc(1, 2, " sum ")

```

```

word = input("Type in an word:
")
reverse = " "
for letter in word:
    reverse = letter +
reverse
" " "
letter_num = 0
reverse = ''
while letter_num < len(word):
    reverse = (word[ let -
ter _num] + reverse)
    let ter_num = letter_num
+ 1
" " "

print ("Re verse: ", reverse)

```



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