**“Weekend Fun”**

**Create a program that is a palindrome?**

**Lists**

* A type of variable in Python

my\_list = [ 1, 2, 3, 4, 5]

* More commonly known as an “array” in other programming languages.

**Indexing**

* A number that represents a position on the list
* Indices start at zero (0) and increases in value

print(nums[2]) # display the third value in the list

* A for loop can be used to access all indices in the list

for i in range(5):

print(nums[i])

* Can’t access indices for elements that don’t exist.(e.g. nums[100] )

**Negative Indexing**

* Starts indexing at the last element in the list and the more negative the index, the more you move backward through the list

nums[-1] # the last element in the list

nums[-2] # the last element in the list

……. (and so on)

* Can’t access indices for elements that don’t exist.(e.g. nums[-100] )

**No Limits to Data Types**

* A list can contain all different types of data as well(e.g. one number, one string, one…)
* A list can contain all the same type of data

(e.g. all numbers, all strings, etc.)

**Lists are Mutable**

* New data can to added after the list has been created

nums.append(6)

nums.insert(3, 8)

* Data can be removed from the list

del nums[3]

nums.remove(5) # finds the first 5 in the list and deletes it

nums.pop() # removes last one

* Existing data can be changed in the list

nums[2]=12

**List Functions**

* len(name\_of\_list) – counts the items in the list
* list.index(val) – returns index number of value
* list.sort() – sorts the list itself
* min(name\_of\_list) – returns the lowest value
* max(name\_of\_list) – returns the greatest value
* list.reverse() - reverses the list itself
* list.count(val) – returns the number of elements that contain the value
* when it says list.something – list is the name of your list. For this class the list is called nums
* list(not\_a\_list) – converts a non-list into a list

**Lists and For Loops**

* you can ‘iterate’ through the values in a loop using a standard For loop

for n in nums:

print(n) # prints out each value in list

* the list doesn’t have to be in a variable

for n in [1, 2, 3, 4, 5]:

print(n)

**Lists within Lists**

* Similar to multidimensional arrays in other programming languages

grid = [ [1, 2, 3, 4, 5] , [6, 7, 8, 9, 10] ]

**Tuples**

* Another type of variable, like list, that can contain multiple values
* There are almost no additional functions, like sorting, reversing….
* Once a tuple is created, it can’t be modified
* It is “immutable”

nums = (1, 2, 3, 4, 5)

nums = (1,) # for single numbers

**Packing/Unpacking Tuples**

* “Packing” is the process of storing multiple numbers in a single variable

nums = (1, 2, 3)

* “Unpacking” is the process of extracting multiple numbers from a single variable into separate variables

a, b, c = nums

a=1, b=2, c=3 # these are the values that are extracted from nums

**Strings act like immutable lists**

* You can use the index number to access a single character

print(str[3])

* You can use a For loop to access all the elements

for c in str:

Print(c)

* You can’t modify the string

str[3] = “x” # this generates an error