Lesson Nine

Math 6080 (for the Masters Teaching Program), Summer 2020

For Loops. A for loop is used to run through the elements of an array or the characters of a string, which is very similar to an array. Try the two bits of code:

```
weekdays = [”monday”,”tuesday”,”wednesday”,”thursday”,”friday”]
for x in weekdays:
    print(x)

for x in ”climbing ivy”:
    print(x)
```

This prints the weekdays on successive lines, and the second prints the characters of ”climbing ivy” on successive lines. You can break out of a for loop:

```
for x in weekdays:
    print(x)
    if x == ”Wednesday”
        break
```

prints the weekdays only up to Wednesday and then stops. There is also a continue command that skips to the next iteration of the loop.

```
for x in weekdays:
    if x == ”wednesday”:
        print(”almost over the hump”)
        continue
    if x == ”friday”:
        print(”thank god it’s ”, x)
        continue
    print(x)
```

has the following output:

```
monday
tuesday
almost over the hump
thursday
thank god it’s friday
```

Notice that the x appearing in the for loop is a variable, which is assigned to each of the successive elements of the array or characters of the string. This is the exception to the rule that any variable must be followed by an equals sign.

The for loop can come with a range() option rather than cycling through a list.

```
for x in range(10):
    print(x)
```

prints the numbers from 0 to 9. And as in the indexing of a string, there sre:

range(a,b) and range(a,b,c) (for integers a,b and c)

which you should experiment with.

Exercise. Use a for loop in place of a while loop to redo the program that prompts the user for a number n and either returns ”n is a prime” or the smallest divisor.