**Module 6: Lab Activity – An Introduction to Python Modules**

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**CSS 225**

**Deliverables:**

Python programs for the following problems. Use the names listed below:

* Problem 1 – randomrange.py
* Problem 2 – randomint.py
* Problem 3 – randomday.py
* Problem 4 – pi.py
* Problem 5 – degrees.py
* Problem 6 – factorial.py

**All submitted code must include comments:**

# Your Name

# The Date

# The Problem Number and Description

# Any other information throughout your code that is helpful

Python modules facilitate modular programming. Modular programming refers to the process of breaking a complex program into smaller subtasks, modules. You can use and reuse modules to build a larger application.

Advantages include:

Simplicity – focus on small portions of a problem instead of the entire problem.

Maintainability – designed to use logical boundaries between different problems

Reusability – can reuse by other parts of an applications and removes duplicate code

Scoping – define a separate namespace

All modules use an import statement: import <module\_name>. We used this one last week.

import turtle

All modules use dot notation to call objects in that module. We used this one last week.

alex.forward()

**The Random Module**

This module provides access to functions that support the generation of random numbers. You can find all of the random functions here: <https://docs.python.org/3/library/random.html#module-random>

Use it to:

* pick a random number in a given range
* pick a random element from a list
* make a password

**Problem 1:** Use a for statement and random.randrange to print 10 random integers between 25 and 35.

*#author: Joel Navarrete  
#This program gives you 10 random numbers from a range you choose*import random  
  
for i in range(10):  
 *#print(i)* print(**"This is the random number: "**, random.randrange(25, 35))

**Problem 2:** Use random.randrange to print an odd integer between 0 and 100.

*#author: Joel Navarrete  
#This program gives you an odd integer between 0 and 100 everytime you run the program*import random  
  
print(**"This is the odd integer between 0 and 100: "**, random.randrange(-1, 100, 2))

**Problem 3:** Use random.choice to select a day of the week from a list and print that day.

*#author: Joel Navarrete  
#This program gives you a random day of the week from the list*import random  
  
weekList = [**"Monday"**, **"Tuesday"**, **"Wednesday"**, **"Thur"**, **"Fri"**, **"Sat"**, **"Sun"**]  
print(**"random day from week is: "**, random.choice(weekList))

**The Math Module**

This module provides access to the mathematical functions. You can find all of the math functions here: https://docs.py thon.org/3/library/math.html#module-math

Use it to:

* calculate trigonometric functions
* calculate logarithmic functions
* access mathematical constants

**Problem 4:** Search on the internet for a way to calculate an approximation for pi. There are many that use simple arithmetic. Write a program to compute the approximation and then print that value as well as the value of math.pi from the math module.

*#author: Joel Navarrete  
#This program computes the approximation and then prints the value of pi and math.pi*import math  
  
math.pi == 355/113  
print(math.pi)

**Problem 5**: Search the internet for how to convert radians to degrees. Write a program to compute the conversion given a user input value. Print this value as well as the calculated value using the degrees function in the math module.

*#author: Joel Navarrete  
#This program converts radians to degrees*import math  
  
pi=22/7  
radian = float(input(**"What is your radian value that you'd like to convert?: "**))  
degree = radian\*(180/pi)  
print(degree)

**Problem 6:** Use a for statement to calculate the factorial of a user input value. Print this value as well as the calculated value using the factorial function in the math module.

*#author: Joel Navarrete  
#This program lets the user enter a number value and it'll give it the factorial*def factorial(n):  
 if n == 0:  
 return 1  
 else:  
 return n \* factorial(n-1)  
n=int(input(**"Input a number to compute the factiorial : "**))  
print(factorial(n))