

## CSCI 127, Final Practicum – December 14, 2017

Name \_\_\_\_\_

Question One. 25 points. Supply the missing three statements in the program below such that the desired output is produced. The variable *units* is a list of academic departments at MSU. The variable *enrollments* is a list of corresponding student enrollments. The program should print out a pandas DataFrame that contains information about the 4th largest unit and then the 3rd largest unit. (You may assume that the variable *units* contains four or more departments.) Comments are not necessary. Hint: Read the documentation for pandas.DataFrame.

Desired Output:

```
          Unit  Enrollment
5  School of Computing      552
0  Chemical and Biological Engineering  563
```

Python Solution:

```
import pandas as pd                                # Do not import anything else

units = ["Chemical and Biological Engineering", "Civil Engineering", "Computer Engineering", "General
Engineering", "Mechanical and Industrial Engineering", "School of Computing"]

enrollments = [563, 731, 410, 210, 1463, 552]      # 563 students in Chemical and Biological Engineering, etc.

dataset = list(zip(units, enrollments))
dataframe = pd.DataFrame(data=dataset, columns=["Unit", "Enrollment"])

# Write the missing statements below this comment
```

Question Two. 50 points. On the next page, supply the missing class and its methods such that when the program executes, it produces the desired output. The solution should be high quality; comments are not necessary. Do not make any changes to the code that appears on this page.

Desired Output:

```
My Schedule
-----
CSCI 127
M 171
WRIT 101
```

Python Solution:

```
import numpy as np

# -----

class Course:

    def __init__(self, rubric, number):
        self.rubric = rubric
        self.number = number

    def __str__(self):
        return self.rubric + " " + str(self.number)

# -----

def main():

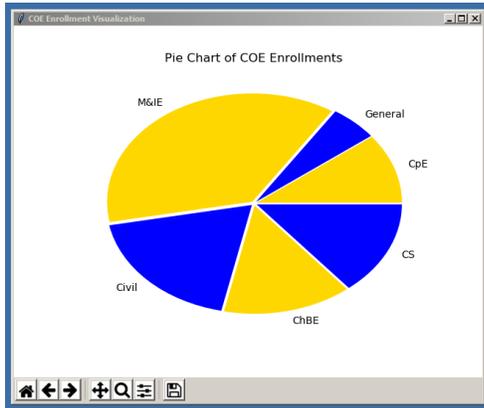
    my_courses = Course_Schedule(3)
    course_1 = Course("CSCI", 127)
    my_courses.add(course_1)
    course_2 = Course("M", 171)
    my_courses.add(course_2)
    course_3 = Course("WRIT", 101)
    my_courses.add(course_3)
    print(my_courses)

# -----

main()
```



Question Three. 25 points. Complete the Python program below such that the following visualization is produced. The pie wedge color for CS, Civil and General is blue. The other pie wedge color is gold. Notice that there is a small gap between each pie wedge. The solution should be high quality; comments are not necessary. Hint: Read the documentation for `matplotlib.pyplot.pie`



```
import numpy as np
import matplotlib.pyplot as plt
```

```
units = ["CS", "ChBE", "Civil", "M&IE", "General", "CpE"]
enrollments = [552, 563, 731, 1463, 210, 410]
```

```
# Do not import anything else
```

```
# See question 1 for a description
# See question 1 for a description
```

```
# Write the missing statements below this comment
```