

**Spring 2014 Introduction to Computer Programming (COP 3223) Test #1 Section 4
Test #1 Solution**

1) (6 pts) Give a list of three escape sequences. List both the character and its code.

Character	Code
double quote	<code>\"</code>
single quote	<code>\'</code>
backslash	<code>\\</code>

Grading: 1 pt per box, other escape sequences exist...

2) (4 pts) Write a single line of code that prompts the user with, "Please enter your grade point average", and stores her response in the variable gpa.

`gpa = float(input("Please enter your grade point average.\n"))`

Grading: 1 pt LHS, 1 pt float, 1 pt input, 1 pt prompt

3) (10 pts) Give two different examples where using modulus (%) and integer division (//) help solve a problem.

1. To convert someone's height from inches to feet and inches, we divide the total number of inches by 12 to get feet and mod by 12 to get inches.

2. If we were splitting n slices of pizza evenly amongst k people and giving the leftovers to the neighbor, n/k would be the number of slices each person in the group gets and n%k would be the number of slices the neighbor receives.

Grading: Many examples work. 5 pts each, partial possible, use your judgment

4) (10 pts) What is the output of the following segment of code:

```
a = 2
b = 5
for i in range(5):
    print(b, end = " ")
    b = b + a
    a = a + 2
```

5 7 11 17 25 (Grading: 2 pts each, credit for cascades)

5) (4 pts) What is the output of the following segment of code:

```
a = 6
b = 6
if a > b or b < a:
    print("A", end = " ")
if 2*b > a:
    print("B", end = " ")
elif (3*b+2)%(2*a) < 2:
    print("C", end = " ")
else:
    print("D", end = " ")
```

B (Grading: 4 pts correct, 2 pts for B and other, 0 otherwise)

6) (10 pts) What is the output of the following segment of code?

```
str = "PYTHONCLASS"
print(str[1:7])
print(str[:10])
print(str[4:])
print(str[-8:-4])
print(str[:-6])
```

```
YTHONC
PYTHONCLAS
ONCLASS
HONC
PYTHO
```

Grading: 2 pts each, 1 pt off by 1 letter, 0 otherwise

7) (10 pts) What is the output of the following segment of code? Note that the output is not unique, since sets can be listed in any order. Any valid answer will be counted as correct.

```
listx = [1,2,3,4,5,7]
listy = [2,4,6,7,8]
x = set(listx)
y = set(listy)
print(x & y)
print(x | y)
print(x ^ y)
print(x - y)
print(y - x)
```

{2, 4, 7}

{1, 2, 3, 4, 5, 6, 7, 8}

{1, 3, 5, 6, 8}

{1, 3, 5}

{8, 6}

Grading: 2 pts each, 1 pt if off by 1 item, 0 otherwise

8) (10 pts) Assume that a given list, `namelist`, contains unique names, all lowercase, that each start with a different letter. Use this list to create a dictionary named `lookup`, that maps the first letter of each of these names to the names themselves. For example, if `namelist = ['anne','emma','george']`, then `lookup` should be `{'a': 'anne', 'e': 'emma', 'g': 'george'}` after your code segment completes.

```
lookup = {} // 2 pts
for i in range(len(namelist)): // 3 pts
    lookup[namelist[i][0]] = namelist[i] // 5 pts
```

Grading: Last line: 1 pt dict name, 2 pts for index into dictionary, 2 pts for RHS

9) (15 pts) McKnights Food Stuffs sell chicken nuggets in two packages: 8 piece and 25 piece. The cost of the former is \$3 and the cost of the latter is \$7. Given a total number of nuggets you want to buy, complete the program below so that it determines the minimum price of obtaining the desired number of nuggets (or more).

```
COST8 = 3
COST25 = 7
```

```
def main():
```

```
    n = int(input("How many chicken nuggets do you want to buy?"))
    cost = 0
```

```
    num_25 = n//25                # 3 pts
    num_8 = 0
```

```
    if ((n%25)>16):                # 3 pts
        num_25 = num_25 + 1        # 3 pts
    else:
        num_8 = (n%25 + 7)//8      # 3 pts
```

```
    cost=num_25*COST20+num_8*COST6 # 3 pts
```

```
    print("The minimum cost to get",n,"nuggets is",cost,"dollars.");
```

```
main()
```

10) (20 pts) Complete the program below so that it prints out a chart of the value of a savings account at the end of each year. The account earns 3% interest each year but the user is charged a \$50 fee at the end of the year right after the interest accrues. Ask the user how much they put into the account initially, how much they contribute each year thereafter, and how many years they keep the account. Based on this information, print out a chart with how much money is in the account at the end of each year, starting with year 1. For example, if the user initially puts \$10,000 in the account, after 1 year, $\$10,000 \times .03 = \300 accrues in interest, of which \$50 goes to the annual fee, leaving \$10250 after year 1. If in every following year \$750 is put into the account at the end of the second year $\$11000 \times .03 = \330 interest accrues, leaving \$11280 in the account after the end of the second year, since the annual fee must be deducted again. **(Note: This is just an example. Your program should work for all valid input values, not just \$10000 and \$750!!!)**

```
RATE = 0.03
YEARLYFEE = 50
```

```
def main():
```

```
    initMoney = float(input("What's the starting value?\n"))
    yrMoney = float(input("What's the annual contribution?\n"))
    numYears = int(input("How many years will you invest?\n"))
```

```
    for year in range( 1 , numYears+1 ):           # 4 pts
        initMoney=initMoney*(1 + RATE)           # 4 pts
        initMoney=initMoney - YEARLYFEE          # 4 pts
        print(year, initMoney)                   # 4 pts
        initMoney=initMoney+yrMoney              # 4 pts
```

```
main()
```

10) (1 pt) In what Winter Olympic sport is the curling stone used?

Curling (1 pt – give to all)