

CS 8 Introduction to Computer Science

Homework Assignment 5

Only questions 1, 3, 5, 7 will be graded

Question 1

Write the results of these Python statements:

```
>>> 3**5//2+4*5-7
```

```
>>> 25%4+7//2*3
```

```
>>> int(float(int(float(7)+1.5)-2.5)+3.5)
```

```
>>> bool(-1) and True or bool(int(0.5))
```

```
>>> 43//13//3*5//2
```

Question 2

Write the results of these Python statements:

```
>>> a = [1, 2, 4, 8, 4, 2, 1]
```

```
>>> b = 0
```

```
>>> for x in a:
```

```
    b = b + x
```

```
>>> print(b)
```

```
>>> a = [1, 2, 4, 8, 16, 32, 64]
```

```
>>> b = 0
```

```
>>> for x in a:
```

```
    b = b + (-1)**(x%3)*x
```

```
>>> print(b)
```

```
>>> b = 0
>>> for x in range(10):
        b = b + x%2 + x%3 + x%5
>>> print(b)
```

```
>>> a = "cheesecake"
>>> b = ""
>>> for c in a:
        b = c + b
>>> print(b)
```

```
>>> a = "chocolate"
>>> b = ""
>>> for c in a:
        b = b + 2*c
>>> print(b)
```

Question 3

Write the results of these Python statements:

```
>>> a, b = 0, 0
>>> while(a<21):
        if a%2 == 1:
            b = b + a
            a = a + 1
>>> print(a,b)
```

```
>>> a = ["12357", "13457", "13567", "13578"]
>>> for x in a:
        for y in x:
            if int(y)%2==0:
                break
            print(y,end=" ")
        print()
```

```

>>> a = ["12468", "23468", "24568", "24678"]
>>> for x in a:
    for y in x:
        if int(y)%2==1:
            continue
        print(y,end=" ")
    print()

```

```

>>> a, b, n, s = 10, 11, 31, 0
>>> while(True):
    print(a,b,n,s)
    if(b%2==1):
        s = s + a
    if(s%2==0):
        s = s//2
    else:
        s = (s+n)//2
    b = b//2
    if b==0:
        break

```

Question 4

Assume that the turtle `bob` is facing right and in the left bottom corner of the window, as shown. Draw the traces of the turtle `bob` for each given code. Indicate the final location and direction of the turtle.

```

for i in range(6):
    for j in range(2):
        bob.forward(100-i*10)
        bob.left(90)

```

▷

```
for i in range(6):
    for j in range(3):
        bob.forward(100)
        bob.left(120)
    bob.left(60)
```

▷

```
for i in range(4):
    bob.forward(100)
    bob.circle(20)
    bob.left(90)
```

▷

Question 5

Describe in English what this image or pixel function does.

```
def fun1():
    p = Pixel(0,0,0)
    return(p)
```

Describe in English what this image or pixel function does.

```
def fun2():
    p = Pixel(255,255,255)
    return(p)
```

Describe in English what these image or pixel functions do and what are their difference.

```
def fun3(p):
    r = p.getRed()
    g = p.getGreen()
    b = p.getBlue()
    x = (r+g+b)//3
    q = Pixel(x,x,x)
    return(q)
```

```
def fun4(p):
    r = p.getRed()
    q = Pixel(r,r,r)
    return(q)
```

Describe in English what this image or pixel function does.

```
def fun5(p):  
    r = 2*p.getRed()%256  
    g = p.getGreen()  
    b = 2*p.getBlue()%256  
    q = Pixel(r,g,b)  
    return(q)
```

Question 6

Consider the following three functions and answer the subsequent questions.

```
def funa(x):  
    y = x**2  
    x = y  
  
def funb(x):  
    y = x**2  
    x = y  
    return(x)  
  
def func(x):  
    y = x**2  
    x = y  
    print(x)
```

What will the following code fragments print?

```
>>> a, x, y = 3, 4, 5  
>>> print(funa(a))  
>>> print(a, x, y)
```

```
>>> a, x, y = 3, 4, 5  
>>> print(funb(a))  
>>> print(a, x, y)
```

```
>>> a, x, y = 3, 4, 5  
>>> print(func(a))  
>>> print(a, x, y)
```

Mark the code fragments below as valid or not valid:

```
>>> funa(funb(5))
```

```
>>> funa(func(5))
```

```
>>> funb(funa(5))
```

```
>>> funb(func(5))
```

```
>>> func(funa(5))
```

```
>>> func(funb(5))
```

Question 7

Consider the following three functions and answer the subsequent questions.

```
def funa(x):
    n = len(x)
    for i in range(n):
        x[i] = x[i]**2
    z = sum(x)
    return(z)

def funb(x):
    n = len(x)
    y = x[:]
    for i in range(n):
        y[i] = y[i]**2
    z = sum(y)
    return(z)
```

What will the following code fragments print?

```
>>> w = [1, 2, 3, 2, 1]
>>> print(funa(w))
>>> print(w)
```

```
>>> w = [1, 2, 3, 2, 1]
>>> print(funb(w))
>>> print(w)
```

Question 8

Consider the following three functions and answer the subsequent questions.

```
def funa(x):
    for y in x:
        x[y] = x[y]**2
    z = 0
    for y in x:
        z = z + x[y]
    return(z)

def funb(x):
    z = 0
    for y in x:
        z = z + x[y]**2
    return(z)
```

What will the following code fragments print?

```
>>> w = {"a":5, "b":4, "c":3, "d":4, "e":5}
>>> print(funa(w))
>>> print(w)
```

```
>>> w = {"a":5, "b":4, "c":3, "d":4, "e":5}
>>> print(funb(w))
>>> print(w)
```