

IB computer science

Group14

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Test 2

1) Write the output of the following programs (10 points each)

a. `a=[0,1]`

`for i in range (1,5):`

`a=a+[a[i]+a[i-1]]`

`print a`

`[0,1,1,2,3,5]`

b. `a=[]`

`for I in range(4):`

`b=[]`

`for I in range(3):`

```
b=b+[i+2*x]
```

```
a=a+[b]
```

```
print a
```

```
[[0,2,4],[1,3,5],[2,4,6],[3,5,7]]
```

```
c. a=[1,3,4,2,8]
```

```
b=[ ]
```

```
for I in range(len(a)-1):
```

```
b=b+[a[i+1]-a[i]]
```

```
print b
```

```
[2,1,-2,6]
```

2) write the output of the following programs.(10 points each)

a. write a program that print s the sum of 100 random number between 0 and 1.

```
Import random
```

```
S=0
```

```
For I in range(100):
```

```
    S=s+random.uniform(0,1)
```

```
Print s
```

b. Write a program that prints the average value of an array “a”.

```
a=[n,n+1,n+2,n+3,n+4,n+5.....]
```

```
print sum(a)/len(a)
```

c. Write a program that builds a 10 by 10 checkerboard array of ones and zeros.

```

Import random
xx=[]
for l in range(10):
    r=xx+[range(10)]

b=range(10)
t=3.0

for j in range(10):
    for i in range(10):
        if random.uniform(0,10)<t:
            r[i][j]=1
        else:
            r[i][j]=0
print r

```

3) draw the output of the following program. (20 points)

```

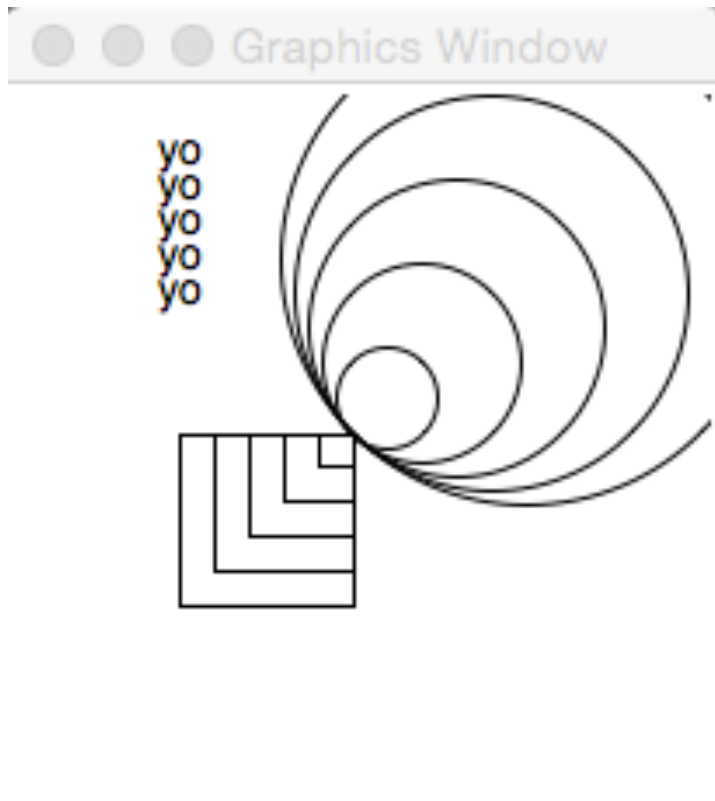
from graphics import *

win=GraphWin()
win.setCoords(-10,-10,10,10)

for i in range(1,6):
    circ=Circle(Point(i,i),(2**0.5) * i)
    rec=Rectangle(Point(-i,-i),Point(0,0))
    t = Text(Point(-5,9-i),"yo")
    circ.draw(win)
    rec.draw(win)

```

```
t.draw(win)
```



4) Perform the following conversions. (10 points each)

- a. Convert the base5 number 342 to base10
- b. Convert the binary number 1010001 to base 10.
- c. Convert the base10 number 532 to base5.

97

81

4112