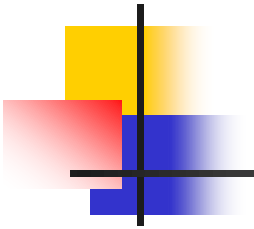

Introduction to Programming

Department of Computer Science and Information Systems

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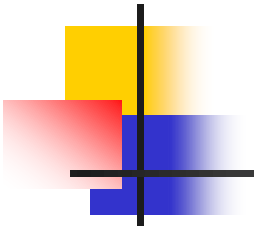
Spring 2020

Revision of the Summer 2018 Examination



Question 1a

Which of the following are names of variables

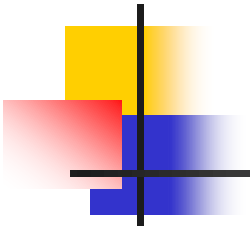
ZZZZ

oscar_6

_dollar$

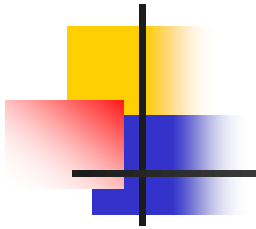
0Ooo

O00oo



Rules for the Names of Variables

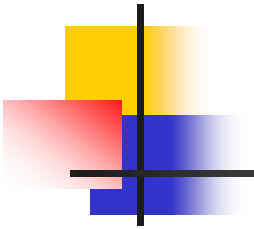
- The only characters allowed are numbers, letters and underscore
- A name cannot begin with a number



Question 1b

What are the final values of a, b, c, d, e?

- a = 2, b = 7, c = 3
- d = 4
- e = 4
- a = a+a*a
- b = 3*b//4
- c = round(400/(300/(200/(11%c))), 2)
- d = 10**d*3**2
- e = round(34/e+6) # up or down?



Operators and Precedence

- Exponentiation: **
- Times:* Real Division:/ Integer Division:// Remainder:%
- Plus: + Minus: -

- Apply the highest precedence operator first:
- 25%2**3
- If the operators have the same precedence then evaluate left to right:
- 25%3*8

Question 2b

- A shop sells two products, A and B.

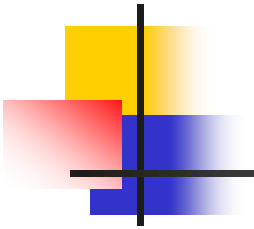
Product	Purchased by shop	Sold by shop	Discount
A	£120	£190	10%
B	£200	£310	20%

Write Python code to compare the profits made by selling each type.

Question 2b Continued

Product	Purchased by shop	Sold by shop	Discount
A	£120	£190	10%
B	£200	£310	20%

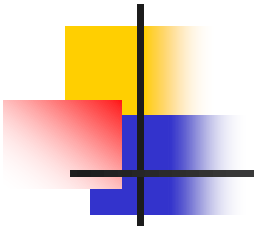
```
profitA = sellingPriceA*(1-discountA/100)-purchasePriceA
profitB = sellingPriceB*(1-discountB/100)-purchasePriceB
if profitA > profitB :
    print("A makes more profit")
elif profitA < profitB :
    print("B makes more profit")
else:
    print("A and B make the same profit")
```



Question 3

Find five errors in the code

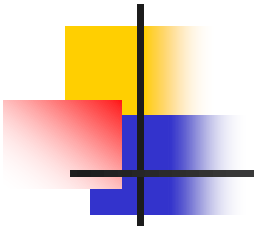
```
1. orPrice = input("enter original price:")
2. if onSale :
3.     discount = 0.9
4. sellPrice = trunc(orPrice*discount, 0)
5. print("orPrice (plus fee) is", orPrice+1)
6. print("Sell price is"+sellPrice)
```



Question 4a

- Write code to read from the keyboard the number of cans. Assign the number to numCans. Set numCans to 0 if the number is negative and include an error message

```
numCans = int(input("Enter number of cans:"))
if numCans < 0 :
    numCans = 0
    print("Error: negative number")
```



Question 4b

```
numCans = int(input("Enter number of cans:"))
```

- What is the value of numCans in the following cases

```
Enter number of cans: 5          # 5
Enter number of cans: 7.2        # error
Enter number of cans: -4         # 0
```

Question 4c (i)

- What is printed when the following code is run?

```
print(float("3e1")+int(-7.6))

"3e1"              # "30.0"
float("3e1")       # 30.0
int(-7.6)          # -7
23.0               # number printed
```

Question 4c (ii) and (iii)

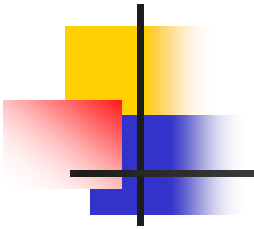
what is printed when the code is run?

```
print("smart"[2]*3+5*'kids'[-2])
        "smart"[2]    # "a"
        'kids[-2]'      # "d"
        "a"*3+5*"d"   # “aaaddddd”

print(len("\"come on!\"\\"))
        "..."      # quote marks for a string
        \"         # the character quote
        \\          # the character backslash
```

Question 4c (iv) and (v)

- What is printed when the following code is run?

```
print(float(str(-4*2)))      # -8.0

bbk=["Birkbeck", "University", "Of", "London"]
print(bbk[1][-2])              # t
```



Question 5a

- Identify the format specifier, the format string and the string formal operator:

```
price = 1.229
print("Price per litre: %5.2f" % price)
```

Question 5b

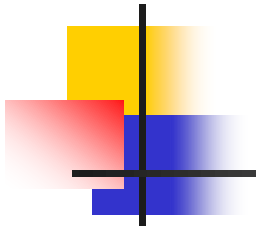
- Describe the print out when the following statements are executed. Use ~ for a space.

```
percentage = 69.9763
print("A:", "%d" % percentage)
A:~69  # %d implies integer

print("B:", "%.f" % temperature)
B:~70     # %.f implies no decimal places
```

Question 5b Continued

- What is printed? Use ~ to indicate a space

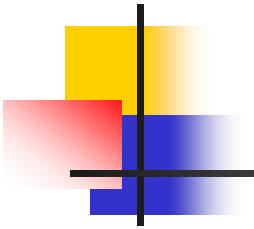
```
percentage = 69.9763
print("C:", "%s" % percentage)
C:~69.9763     # %s implies string

print("D:", "%06.2f" % percentage)
D:~069.98        # %06.2f implies a field of width 6
# two decimal places and 0 padding on the left
```



Question 6a

- Evaluate the following expressions

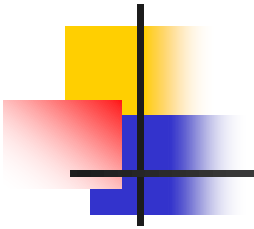
```
4 > 7
4 == 4
2 < 5 > 6
4 != 5
```



Question 6b

- Design a Boolean expression that has the value True if at least one of the three variables x, y, z has the value 0. Otherwise the expression has the value False.

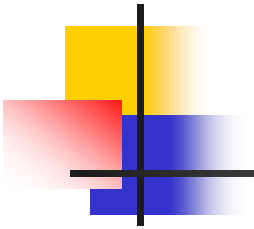
x == 0 or y == 0 or z == 0



Question 6c

- Write out the truth table for the Boolean expression A and not(B)

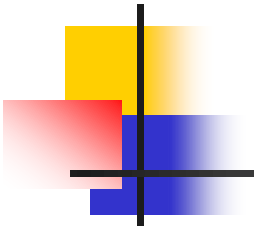
A	B	A and not(B)
0	0	0
0	1	0
1	0	1
1	1	0



Question 7a

- What is printed when the following code is run firstly with x equal to 4 and secondly with x equal to 5?

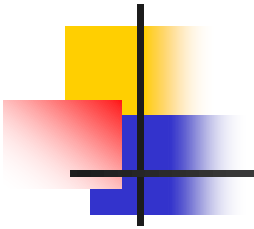
```
if x == 4 :
    print("a")
else :
    if x == 5 :
        print("b")
        print("c")
```



Question 7b

- What is printed when the following code is run firstly with x equal to 4 and secondly with x equal to 5?

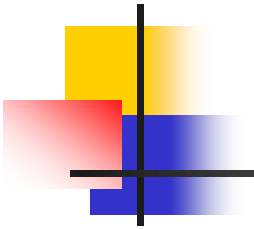
```
if x == 4 :
    print("a")
else :
    if x == 5 :
        print("b")
print("c")
```



Question 7c

- Write code for an if statement that prints True if x has a value of type float in the range 0 to 4 inclusive and that prints False otherwise.

```
if x >= 0 and x <= 4 :
    print(True)
else :
    print(False)
```



Question 8a

- What is printed when the following code is executed?

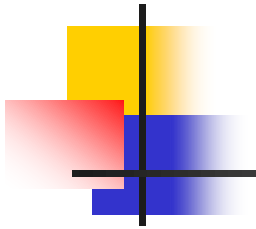
```
i = 0
sum = 0
while i <= 2 :
        sum = sum+i
        i = i+1
print(sum)                  # 0+1+2 = 3
```

Question 8b

Replace the while loop in Q8a with a for loop

```
i = 0
sum = 0
while i <= 2 :
        sum = sum+i
        i = i+1
print(sum)
```

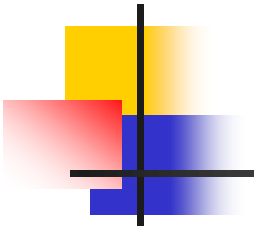
```
sum = 0
for i in range(3) :
        sum = sum+i
print(sum)
```



Question 9a

- Identify the function header and the function body in this code

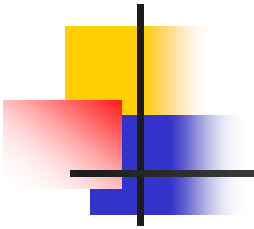
```
def cubeVolume(sideLength) :
        if (sideLength <= 0 :
                return 0
        volume = sideLength**3
        return volume
```



Question 9b

What is printed by the following code?

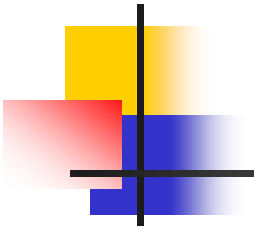
```
sideLength = 2
print(cubeVolume(-1))
sideLength = 3
print(cubeVolume(sideLength))
```



Question 9c

- Write a function cubeVolume2 that requests a value of sideLength and returns the volume of the cube

```
def cubeVolume2():
    s = input("Please enter the side length:"))
    sideLength = float(s)
    return cubeVolume(sideLength)
```

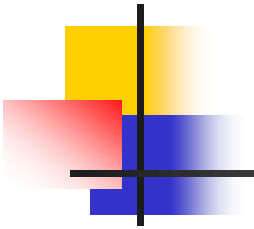


Question 10a, b

- Write out all the values of i such that the following code is executed without error.

```
ls = [3, 1, 7, 2]
print(ls[i])
```

- List the values of i such that i and ls[i] have the same value.



Question 10c

- What is printed when the following code is executed?

```
ls = [3, 1, 7, 2]
ls.insert(2, 3)
print(ls)
```