

# CSI 11

## Final Exam Study Guide

Here you can find the type of the questions that you might be asked on the Final Exam. Make sure to review the Study Guide for the Midterm Exam as well!

### 1 True/False and Multiple Choice Questions

1. Consider the following `if-elif-else` structure:

```
if x == -1:
    print("Disagrees")

elif x == 0:
    print("Neutral")

elif x == 1:
    print("Agrees")

else:
    print("Invalid entry")
```

- 1) if `x` is 1, what is output?
- 2) if `x` is -2, what is output?
- 3) Could the programmer have written the three branches in the order:

```
x == 1,
x == 0, and
x == -1.
```

Did he achieve the same results (Yes/No)?

- 4) In the code above, suppose a programmer, after the third branch (`x == 1`), inserts a new branch:

```
elif x == -1 ...
```

When might that new branch execute?

- (a) when `x` is 1
  - (b) when `x` is -1
  - (c) never
- 5) In the code above, suppose a programmer removed the `else` part entirely. If `x` is 2, which is correct?

- (a) no branch will execute
- (b) the last brunch (`elif x == 1`)
- (a) the program is not legal

2. What is the final value of `bonus_val`?

```
bonus_val = 11

if bonus_val < 12:
    bonus_val = bonus_val + 2
    bonus_val = 3 * bonus_val

else:
    bonus_val = bonus_val + 10
```

- (a) 11      (b) 17      (c) 21      (d) 39

3. A physical devices that a computer is made of are referred to as \_\_\_\_\_

- (a) software      (b) hardware      (c) tools      (d) the operating system

4. Indicate whether the expression evaluates to true or false, if `x` is 5, `y` is 7.

- 1) `x == 5`  
(a) True      (b) False
- 2) `x == y`  
(a) True      (b) False
- 3) `y != 7`  
(a) True      (b) False
- 4) `y != 99`  
(a) True      (b) False
- 5) `x != y`  
(a) True      (b) False

5. Determine the final value of `num_boxes`

```
num_boxes = 0
num_apples = 9

if num_apples < 10:
    if num_apples < 5:
        num_boxes = 7
    else:
        num_boxes = 2
elif num_apples < 20:
    num_boxes = num_boxes + 1
```

(a) 1      (b) 2      (c) 0      (d) 7

6. Evaluate the Boolean Expressions below, given `num_people = 10`, `num_cars = 2`, and `user_key = 'q'`.

1) `num_people >= 10`

(a) True      (b) False

2) `(num_people >= 10) and (num_cars > 2)`

(a) True      (b) False

3) `(num_people >= 20) or (num_cars > 1)`

(a) True      (b) False

4) `not (num_cars < 5)`

(a) True      (b) False

5) `not (user_key == 'a')`

(a) True      (b) False

6) `user_key != 'a'`

(a) True      (b) False

7) `not ((num_people >= 10) and (num_cars > 2))`

(a) True      (b) False

8) `(user_key == 'x') or ((num_people > 5) and (num_cars > 1))`

(a) True      (b) False

7. Which expression checks whether the list `my_list` contains the value 15?

(a) `15 in my_list[0]`      (b) `15 in my_list`      (c) `my_list['15'] != 0`

8. Which expression checks if the value 10 exists in the dictionary `my_dict`?

(a) `10 in my_dict['key']`      (b) `10 in my_list`      (c) None of the above

9. How many times will the loop body execute?

```
x = 3
while x >= 1:
    x = x - 1
```

(a) 1      (b) 2      (c) 3      (d) 4

10. How many times will the loop body execute?

Assume user would enter 'n', then 'n', then 'y'.

```
user_char = input("Enter:")
while user_char != 'n':
    # Do something
    # Get character from user here
```

(a) 0      (b) 1      (c) 2      (d) 3

11. What loop expression corresponds to the most straightforward translation of English to an expression in Python.

1) Iterate while x is less than 100.

(a) while x is less than 100

(b) while x < 100

(c) while x > 100

(d) while x == 100

2) Iterate while x is greater than or equal to 0.

(a) while x is greater than or equal to 0

(b) while x <= 0

(c) while x >= 0

(d) while x == 0

3) Iterate while c equals 'g'.

(a) while c equals to 'g'

(b) while c = 'g'

(c) while c == 'g'

(d) while c > 'g'

12. What is the output of the following code?

```
x = 1
y = 3
z = 5
while not (y < x < z):
    print(x, end=' ')
    x = x + 1
```

(a) 1 3 5

(b) 1 2 3 4

(c) 1 2 3

(d) 1 2

13. Which loop statement will allow me to iterate over the list `my_prices` using a variable called `price`?
- (a) `for my_prices in price`
  - (b) `for price in my_prices`
  - (c) `for price`
  - (d) `for my_prices`
14. What sequence will be generated by `range(2,20,3)`?
- (a) 2, 5, 8, 11, 14, 17, 20
  - (b) 1, 4, 7, 10, 13, 16, 19
  - (c) 2, 5, 8, 11, 14, 17
  - (d) 0, 3, 6, 9, 12, 15, 18
15. What sequence will be generated by `range(2,9)`?
- (a) 2, 3, 4, 5, 6, 7, 8
  - (b) 2, 3, 4, 5, 6, 7, 8, 9
  - (c) 1, 2, 3, 4, 5, 6, 7, 8
  - (d) 0, 1, 2, 3, 4, 5, 6, 7, 9
16. If `my_list = ['G', 'No', 'Maya']`, what is the output of the program?
- ```
for index, value in enumerate(my_list):
    print(index, value, end = ', ')
```
- (a) G, No, Maya,
  - (b) 1 G, 2 No, 3 Maya,
  - (c) 0 G, 1 No, 2 Maya,
  - (d) G,No,Maya,
17. Which correctly defines two parameters `x` and `y` for a function definition: `def calcVal(...):?`
- (a) `(x;y)`
  - (b) `(x,y)`
  - (c) `(x y)`
18. Given a function definition: `def calcVal(a, b, c):`  
 what value is assigned to `b` during this function call:  
`calcVal(42, 55, 77)`
- (a) 42
  - (b) 55
  - (c) 77
19. Given a function definition: `def calcVal(a, b, c):`  
 and given variables `i`, `j`, and `k`, which are valid arguments in the call `calcVal(...)?`
- (a) `(i,j,k)`
  - (b) `(i+j+k)`
  - (c) `(i,k+j, 109)`

20. The only information available about an online user is what the user intentionally posts on Facebook/Twitter/other social media. True or False?
21. Which of the following is used to scramble plaintext into ciphertext?  
(a) Security (b) Encryption (c) Decryption (d) Privacy
22. HTTPS is a \_\_\_\_\_-based encryption protocol.  
(a) web (b) email (c) Wi-Fi (d) solar
23. The amount of information available on the Internet is\_\_\_\_\_.  
(a) shrinking (b) growing
24. Computer security is  
(a) a case of unauthorized computer access.  
(b) is a kind of cryptography, in which the sender and receiver use the same key for encryption and decryption.  
(c) the prevention of unauthorized computer access, including viewing, changing, or destroying a computer or data.  
(d) is a type of an attack on a web server to overload it.
25. Which website is most likely to have the real purpose of spreading viruses?  
(a) Free games sites  
(b) Commercial shopping site  
(c) Free news article sites with adds  
(d) Free sports article sites with adds

## 2 Questions for understanding the code

For all the questions in this sections you are not to use Python Interpreter. Therefore, look at the code. Understand what should be the output and write it down. Only then, type the code in Python Interpreter to see what is displayed.

1. What does the following piece of a program do? Show the output.

```
a = 1.7
b = 16.6
c = 8.3
print( int(a) + b + c )
```

2. What does the following piece of a program do? Show the output.

```
a = 29
b = 3
print(a*b - a//b + a%b)
```

3. What does the following piece of a program do? Show the output.

```
a = "Good"
b = "day"
print( a + ', ' + b + ', how are you?')
```

4. What does the following piece of a program do? Show the output.

```
a = [1, -3, 9, 1.2, 6, 9.2, -12]
a.append(9)
a.append(-3)
a.append(9)
a.remove(1.2)
a.remove(-3)
print(a)
print(a.count(9))
```

5. What does the following piece of a program do? Show the output.

```
D = {
    12:"The Guardian",
    8:"Tom",
    19:"The Masterpiece",
    23:"Georgetown",
    5: "tennis"
```

```

}

D[15] = "Stevens"
D[12] = "pine tree"

print(D[8] + " " + D[15])

for k in D:
    print(k,"=>", D[k])

```

6. Consider the following program:

```

a = int(input("Enter a number:"))

if number%2 == 0:
    print("tree")
elif number < 0:
    print("house")
else:
    print("jacket")

```

- (a) What does the following piece of a program produce if the user enters 4?
- (b) What does the following piece of a program produce if the user enters -36?
- (c) What does the following piece of a program produce if the user enters 17?

7. Consider the following program:

```

a = input("Enter a phrase:")

if a.count('a') > 0:
    print("found them!")
if a[3] == 't':
    print("found another one!")
if len(a) > 13:
    print("long!")
else:
    print("Hm")

```

- (a) What does the following piece of a program produce if the user enters: picture?
- (b) What does the following piece of a program produce if the user enters: Once upon a time there was a little girl?

(c) What does the following piece of a program produce if the user enters: abrakadabra?

8. Consider the following program:

```
def myFunction(a,b,c):  
    if a > b:  
        return a+b+c  
    elif a < c:  
        return a*b*c  
    else:  
        return a-b-c
```

(a) What does the function call `myFunction(1,2,3)` produce?

(b) What does the function call `myFunction(3,1,2)` produce?

(c) What does the function call `myFunction(5,7,1)` produce?

### 3 Programming Questions

Don't forget to test your program before submitting it.

1. Write a program that prompts the user to input ten decimal numbers, then returns their sum, average and product.

(*hint*: use `for` loop)

Here is an example of the input prompt and output:

---

You will be asked for 10 numbers, then their sum, their average and their product will be displayed.

Enter a decimal number: 12.6

Enter a decimal number: 11.5

Enter a decimal number: 1

Enter a decimal number: 5

Enter a decimal number: 1.8

Enter a decimal number: 19

Enter a decimal number: -23

Enter a decimal number: 29

Enter a decimal number: -29.8

Enter a decimal number: 3

---

Their sum is 30.1

Their average is 3.01

Their product is 1477501221.42

---

2. Write a program that is given a list of integer values `myList`, finds and displays
  - 1) its greatest element (*hint*: use the built-in function `max`),
  - 2) its smallest element (*hint*: use the built-in function `min`),
  - 3) the length of the list (*hint*: use the built-in function `len`),
  - 4) the sum of squares of the values in the list,
  - 5) the average of all the values in the list, and
  - 6) sorted list, from smallest to greatest ((*hint*: use the built-in function `sort`)).
  
3. Write a program that given a string `myString`, finds and displays:
  - 1) the position of letter 'a'  
(*hint*: use the built-in function `index`),
  - 2) the number of occurrences of the sub-string 'aba'  
(*hint*: use the built-in function `count`),
  - 3) the length of the string (*hint*: use the built-in function `len`),
  - 4) the substring starting from position 2 and ending with position 7  
(only if the string is at least 8 symbols long),
  - 5) all the letters/symbols of the string, one by one, one per line, and
  - 6) the string reversed ((*hint*: use the built-in function `reverse`)).
  
4. Write a program that given a dictionary `myDict`, displays all the records of the dictionary, one record per line.
  
5. Write program that takes four words from the user, and
  - 1) Displays all the words concatenated with each other, separated by one space between them,
  - 2) Displays the concatenated the first and the third words (with no spaces between them) and displays the result, and
  - 3) displays their length, in one line, separated by the space.

Here is an example of the input/output:

---

Enter the first word: Ka

Enter the second word: Me

Enter the third word: boom

Enter the fourth word: shift

---

Ka Me boom shift

Kaboom

2 2 4 5

6. Anna is planning a rectangular flower bed. She needs to buy enough planting soil for it. Write the program for her play with the dimensions of the bed: length, width and depth.

Here are some formulas you'd need to use:

1 foot = 12 inches,

volume = length  $\times$  width  $\times$  depth.

Here is an example of the input/output:

---

This program calculates the amount of planting soil needed to create a rectangular flower bed.

Enter the length (in inches) : 72

Enter the width (in inches): 24

Enter the depth (in inches): 12

---

The amount of planting soil needed: 12 cubic feet

7. Write a program that finds two real roots of a quadratic equation.

Assume we have a quadratic equation in the form  $ax^2 + bx + c = 0$ , where  $x$  is a variable, and  $a, b, c$  are real number coefficients.

Then the two real number roots/solutions of this quadratic equation can be found using the formula:

$$x_1, x_2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The program should ask the user to enter the coefficients  $a, b$ , and  $c$  and display the roots.

Here is an example of the input/output:

---

This program calculates the two real number roots/solutions of quadratic equation in the form  $ax^2 + bx + c = 0$ .

Enter coefficient a: 2

Enter coefficient b: 3

Enter coefficient c: -5

---

Roots/solutions are: -2.5 and 1

8. Write a program that prompts the user for a file name, opens that file, reads 5 numbers from it (we assume that numbers are stored one per line in the file), finds their sum and average and stores the results in the file named 'out.txt'. Do not forget to close both files!

Here is an example of the input/output:

---

Enter the file name: s.txt

The numbers:

1

2

3

8

-10

---

Their sum: 4

Their average: 0.8

The results are stored in the file 'out.txt'.

9. Define a function `stats(myList)` that given the Python list `myList` as parameter, displays:
- 1) its greatest element,
  - 2) its smallest element,
  - 3) the length of the list, and
  - 4) the average of all the values in the list.