

# COMP 1405 Introduction to Computer Science I

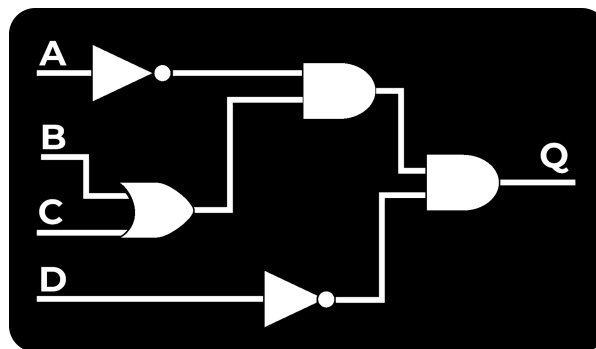
## Study Session Questions

December 27, 2025

1. If  $X = \text{FALSE}$  and  $Y = \text{TRUE}$ , which of these will return **TRUE**?

- ☐ X and Y
- ☐ not( X and Y)
- ☐ (not X) AND (not Y)
- ☐ X OR Y

2. Consider the following logic circuit. What is the output if  $X = \text{True}$  and  $Y = \text{False}$ ?



- A. True
- B. False

3. Match each control statement with what it does.

- |                    |   |
|--------------------|---|
| 1. <b>break</b>    | <b>A.</b> exits the current loop            |
| 2. <b>continue</b> | <b>B.</b> restarts the current loop         |
| 3. <b>pass</b>     | <b>C.</b> doesn't do anything (placeholder) |
| 4. <b>return</b>   | <b>D.</b> exits the current function        |

4. Match each loop to its type.

1.

```
run = True
while run:
    print("hello")
    run = False
```

A. pre-condition with flag variable

2.

```
x = 0
while True:
    x += 1
    if x > 2:
        break
```

B. post-condition without flag variable

3.

```
run = True
while True:
    if not run:
        break
    run = False
```

C. post-condition with flag variable

4.

```
x = 0
while x < 3:
    print("hello")
    x += 1
```

D. pre-condition without flag variable

5. Which of the following Python data types are mutable?

- ☐ List
- ☐ Tuple
- ☐ Set
- ☐ String
- ☐ Dictionary
- ☐ none of these

6. What Python keyword is used to define a function? \_\_\_\_\_

7. Which of the following lines of code are invalid (i.e. will throw an error)? Select all that apply.

- ☐ `int_value = int(True)`
- ☐ `int_value = int({1, 2, 3})`
- ☐ `unk_value = "4.2.0"`
- ☐ `int_value = int(" 42 ")`
- ☐ `str_value = str(45.67)`
- ☐ `string_value = 3 + "hello"`

8. Which of the following are invalid Python function names?
- ☐ `def calculateSum(): return`
  - ☐ `def 2func(): return`
  - ☐ `def _private_func(): return`
  - ☐ `def sum-all(): return`
9. Match each data type to their properties.
- |          |   |
|----------|---|
| 1. set   | A. elements are unordered and unique      |
| 2. dict  | B. elements are stored in key-value pairs |
| 3. list  | C. elements are ordered                   |
| 4. tuple | D. data is immutable                      |
10. Which of the following statements are true? Select all that apply.
- ☐ Declaring a variable in a def without global makes it local.
  - ☐ global variables cannot be accessed in nested defs.
  - ☐ Global vars can be accessed locally without a keyword if it isn't modified.
  - ☐ global variables are automatically immutable and cannot be changed.
  - ☐ A local variable declared in a def can't be accessed outside that def.
  - ☐ 'global' allows a def to modify a variable declared outside the def.
11. Let `str = "goodbye world"`. Indicate the result of each operation.
- |  |          |
|--|----------|
| a. <code>str.split(" ")[1] + str.split(" ")[0][1:4]</code> | a. _____ |
| b. <code>str[:5] + str.split()[-1][:3]</code>              | b. _____ |
| c. <code>"-".join(str.split())[:12]</code>                 | c. _____ |
| d. <code>str.split()[0][2:5] + str.split()[1][:2]</code>   | d. _____ |
12. Which of the following statements about lists in Python are TRUE? Select all that apply.
- ☐ Lists are immutable.
  - ☐ Lists can contain elements of different types.
  - ☐ Lists must have unique elements.
  - ☐ Lists are unordered collections.
  - ☐ Lists do not support slicing.
  - ☐ All of these are false.

13. Match each list method to its description.

- |                          |  |
|--------------------------|--|
| 1. <code>append()</code> | <b>A.</b> adds an element at the end of the list                             |
| 2. <code>pop()</code>    | <b>B.</b> deletes the element at the specified position (or last by default) |
| 3. <code>remove()</code> | <b>C.</b> deletes the first item with the specified value                    |
| 4. <code>insert()</code> | <b>D.</b> adds an element at the specified position                          |

14. What will the following code output?

```
bob = [1, 2, 3]
def pat(krb):
    krb.append(4)

pat(bob)
print(bob)
```

- A. [1, 2, 3]
- B. [1, 2, 3, 4]
- C. Error: 'list' object has no attribute 'append'
- D. None

15. What is the value of `num` after `num = my_list[2][3]`?

```
my_list = [
    [1, 2, 3, 4],
    [5, 6, 7, 8],
    [9, 10, 11, 12]
]
```

- A. 9
- B. 10
- C. 11
- D. 12

16. Which of the following are true about exceptions in Python?

- ☐ An except block can only handle one type of exception at a time.
- ☐ The except block is executed when an exception is raised in the try block.
- ☐ The try/except block can be nested.
- ☐ The try block can have multiple except blocks.
- ☐ The try block can handle exceptions even if there is no except block.
- ☐ none of these are true

17. Match each error to its meaning.

- |                  |  |
|------------------|--|
| 1. Syntax Error  | <b>A.</b> a problem checked by the interpreter, incorrect use of the language itself |
| 2. Runtime Error | <b>B.</b> a problem that isn't checked by the interpreter but crashes the program    |
| 3. Logic Error   | <b>C.</b> a problem that doesn't crash the program, but produces unintended results  |

18. Which of the following are true of binary search? Select all that apply.

- ☐ Binary search compares the target value with each element sequentially.
- ☐ Binary search divides a list into halves and eliminates one half at a time.
- ☐ Binary search can only be applied to sorted lists or arrays.
- ☐ Binary search has a worst-case time complexity of  $O(\log n)$ .
- ☐ Binary search has a worst-case time complexity of  $O(n)$ .
- ☐ Binary search can be implemented recursively or iteratively.

19. Match each code line to what it does.

1. `open(file, 'r')`

**A.** reads through the content of the file, error if the file does not exist

2. `open(file, 'w')`

**B.** overwrites the content of the file, creates the file if it does not exist

3. `open(file, 'a')`

**C.** writes from the end of the file; creates the file if it does not exist

4. `open(file, 'x')`

**D.** creates the specified file, returns an error if the file exists

20. Which of the following are true of linear search? Select all that apply.

- ☐ Linear search has a time complexity of  $O(n)$  in the worst case.
- ☐ Linear search compares each element of the list with the target in order.
- ☐ Linear search requires the list to be in descending order.
- ☐ Linear search is faster than binary search on sorted lists.
- ☐ Linear search has a best-case time complexity of  $O(\log n)$ .
- ☐ Linear search is efficient for small datasets.

21. What will the list `[8,5,4,3,7,6,1,0,9,2]` look like after 4 swaps using each of the following methods? Match accordingly.

1. Quick Sort (using the last element as a pivot)

**A.** `[0,1,2,3,4,6,5,8,9,7]`

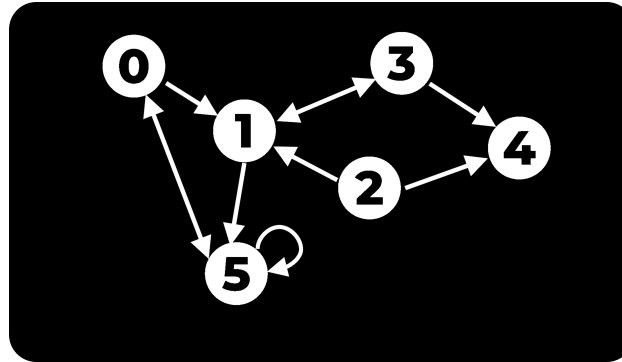
2. Bubble Sort

**B.** `[5,4,3,7,8,6,1,0,9,2]`

3. Selection Sort (selecting the largest element)

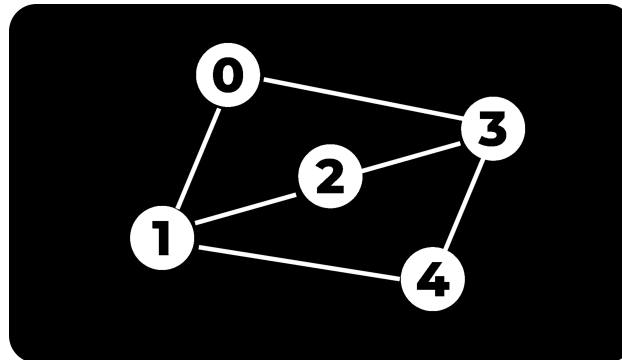
**C.** `[2,5,4,3,0,1,6,7,8,9]`

22. Which adjacency list represents the following graph?



- A.  $[[1, 5], [0, 2, 3, 5], [1, 4], [1, 4], [2, 3], [0, 1, 5]]$
- B.  $[[1, 5], [3, 5], [1, 4], [1, 4], [], [0, 5]]$
- C.  $[[1, 5], [3, 5], [1, 4], [1, 4], [3], [0]]$
- D.  $[[5], [0, 2, 3], [], [1], [2, 3], [0, 1, 5]]$

23. Which adjacency matrix represents the following graph?



- A.  $\begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \end{bmatrix}$
- B.  $\begin{bmatrix} 0 & 1 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 & 0 \end{bmatrix}$
- C.  $\begin{bmatrix} 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \end{bmatrix}$
- D.  $\begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \end{bmatrix}$

24. What will happen if a recursive function does not have a base case?

- A. The computer will violently explode.
- B. The program will throw a syntax error.
- C. The program will crash with a stack overflow.
- D. The program will return an incorrect result (logic error).

25. What will the following code output if the user enters 50?

```
x = input("num:")
try:
    y = x * 2
    print(f"Result_1: {y}")
    z = int(x) + 2
    print(f"Result_2: {z}")
except ValueError:
    print("Error!")
```

- A. Result\_1: 100 Result\_2: 52
- B. Result\_1: 5050 Result\_2: 52
- C. Error!
- D. Result\_1: 5050 Result\_2: Error!

26. What will be printed when the following code runs?

```
a, b, c = 10, 25, 30
if a > b:
    if b > c:
        print("David")
    else:
        print("Mohammad")
else:
    if a + b > c:
        print("Eleena")
        if c - a == b:
            print("Jakob")
        else:
            print("Tiffany")
    else:
        print("Aayla")
```

- A. David
- B. Mohammad
- C. Jakob
- D. Aayla

27. What will the following code return?

```
aaa = 10
bbb = [5, 15]

def foo():
    aaa = 20
    bbb[0] = 50
    print(aaa)

def bar():
    global aaa
    aaa = 30
    bbb = [100, 200]
    return bbb

ccc = foo()
ddd = bar()
print(aaa, bbb, ccc, ddd)
```

- A. 20 30 [50, 15] None [100, 200]
- B. 20 10 [50, 15] 20 [100, 200]
- C. 10 10 [50, 15] None [5, 15]
- D. 20 30 [100, 200] 20 [100, 200]

28. Which of the following inputs  $(x, y)$  will make this code output “yippee”? Select all that apply.

```
x = int(input("num: "))
y = int(input("num: "))

if x > 0 and y > 0:
    print("yippee")
elif x < 0 and y < 0:
    print("no")
elif x > 0 or y > 0:
    if x == 0 or y == 0:
        print("no")
    else:
        print("yippee")
else:
    print("no")
```

- ☐ (2, 4)
- ☐ (2, -4)
- ☐ (-2, 0)
- ☐ (-2, -4)
- ☐ (0, 0)



29. What will the following code output?

```
counter = 0
for i in range(6):
    if i % 2 == 0:
        continue
    for j in range(3):
        if j == 2:
            break
        counter += 1
        if i + j > 3:
            counter += 1
            break
print(counter)
```

- A. 5
- B. 6
- C. 7
- D. 8
- E. 9
- F. the code will not execute OR infinite loop

30. What will the following code output?

```
matrix = [
    [1, 2, 3, 4],
    [2, 1, 4, 3],
    [3, 4, 1, 2],
    [2, 3, 4, 1]
]
matrix[1].pop(2)
matrix[3].remove(matrix[2][2])
matrix.insert(2, [2, 4, 1, 3])
matrix[2].remove(3)
matrix.pop(1)
matrix[3].insert(1, matrix[2].pop(3))
print(matrix)
```

- A. [[2,4,1], [2,1], [4,4,2], [2,3,4,1]]
- B. [[1,2,3,4], [2,4,1], [3,4,1], [2,2,3,4]]
- C. [[1,2,3,4], [2,4,1], [3,4,1], [2,2,4,1]]
- D. [[1,2,3,4], [2,4,1], [4,1,2], [2,3,4,1]]

31. What will the following code output?

```
names = {  
    1: ['Isa', 'Sandra', 'Alik'],  
    2: ['Kyle', 'Nolan', 'Tinaye'],  
    3: ['Simon', 'Jon-Luca', 'Cindy']  
}
```

```
result = []  
for key, value in names.items():  
    if len(value[0]) % key == 0:  
        result.append(value[1])  
    elif key + len(value[0]) > 5:  
        result.append(value[2])  
print(result)
```

- A. ['Isa', 'Kyle', 'Nolan']
- B. ['Jon-Luca', 'Sandra']
- C. ['Sandra', 'Nolan', 'Cindy']
- D. ['Alik', 'Tinaye', 'Jon-Luca']

32. What will the following code output?

```
def fac(n):  
    if n == 0:  
        return 1  
    return n * fac(n - 1)  
  
def fib(n):  
    if n <= 1:  
        return n  
    return fac(n - 1) + fib(n - 2)  
  
print(fib(5))
```

- A. 7
- B. 27
- C. 48
- D. 64

33. What will the following code output?

```
try:
    data = {"a": 1, "b": 2}
    value = 10 / 0
    value = data["c"]
except ZeroDivisionError as e:
    print(f"oops, {e}")
except LookupError as e:
    print(f"oopsie: {e}")
except Exception as e:
    print(f"oops again: {e}")
```

- A. oops, division by zero
- B. oops, division by zero oopsie: 'c' oops again: 'c'
- C. oops, division by zero oopsie: 'c' oops again: division by zero
- D. oops again: 'c'

34. What should we replace line 9 with to make the code function as intended?

```
class Robot:
    def __init__(self, model, task):
        self.model = model
        self.task = task

    def perform_task(self):
        return f"Robot {self.model} is performing: {self.task}"

# i'm on break, fix it yourself
print(worker.perform_task())
```

- A. `worker = new Robot("PhatGPT", "yapping")`
- B. `worker = Robot("WALL-E", "garbage collection")`
- C. `worker = new Robot("Sonny")`
- D. `worker = Robot.perform_task("GLaDOS", "experiment")`