Worksheet 23: if, elif and else

Comparisons, and/or/not, if, if-else, if-elif-else and nested if, with everything from Worksheet 22 - 68 questions

Name _____ **Class** _____ **Date** _____

Remember

```
if marks >= 75:
    print("Distinction")
elif marks >= 40:
    print("Pass")
else:
    print("Fail")
```

`==` `!=` `<` `>` `<=` `>=`	compare two values and give `True` or `False`. `=` stores a value; `==` compares.
`and` `or` `not`	`and`: both must be true. `or`: at least one is true. `not`: flips it.
`:` and indent	every `if`, `elif` and `else` line ends with a colon. The lines inside are indented by 4 spaces.
`elif`	Python checks from the top and runs **only the first** true branch. `else` runs when none is true.
`if` ... `if`	two separate `if`s are both checked, so both can run.
`input()`	always gives a **string**. Use `int()` or `float()` before you compare it with a number.

Instructions

- Write the output **exactly** as Python shows it: every space, comma and line break counts.
- Before you write, find which branch runs. Check the conditions from the top, one at a time.
- Where the user types something, the value appears on screen after the prompt, and the cursor then moves to the next line. Write it too.
- Do not use a computer until you have finished. Then check your answers in Python.

Section A - Warm-up

Write the output of each program.

1

```
x = 14
y = 4
print(x // y, x % y, sep=" r ")
print(x / y)
```

OUTPUT

2

```
a = 7
b = 7
print(a == b, a != b, a >= b)
```

OUTPUT

3

```
n = 15
print(n % 3 == 0, n % 5 == 0, n % 2 == 0)
```

OUTPUT

4

```
age = 13
print(age > 12 and age < 20)
print(age < 5 or age > 60)
print(not age == 13)
```

OUTPUT

5

```
print("5" == 5)
print(int("5") == 5)
print("a" == "A")
```

OUTPUT

6

```
x = 3
x += 4
x *= 2
print(x > 10, x)
```

OUTPUT

7

```
p = True
q = False
print(p and not q)
print(not p or q)
print(not (p and q))
```

OUTPUT

8

```
marks = 72
print("Pass:", marks >= 40, end=" | ")
print("Distinction:", marks >= 75)
```

OUTPUT

Section B - if and if-else

Write the output of each program.

9

```
temp = 35
if temp > 30:
    print("Hot day")
print("Drink water")
```

OUTPUT

10

```
temp = 22
if temp > 30:
    print("Hot day")
print("Drink water")
```

OUTPUT

11

```
n = 7
if n % 2 == 0:
    print(n, "is even")
else:
    print(n, "is odd")
```

OUTPUT

12

```
x = -4
if x < 0:
    x = -x
print(x)
```

OUTPUT

13

```
a = 12
b = 19
if a > b:
    print(a)
else:
    print(b)
```

OUTPUT

14

```
score = 30
if score >= 50:
    print("You win")
    print("Well done")
print("Game over")
```

OUTPUT

15

```
score = 30
if score >= 50:
    print("You win")
else:
    print("Try again")
    print("Score:", score)
print("Bye")
```

OUTPUT

16

```
price = 500
if price > 400:
    price -= 50
else:
    price += 20
print("Pay", price)
```

OUTPUT

17

```
x = 10
if x == 10:
    print("ten", end=" ")
if x > 5:
    print("big", end=" ")
if x > 20:
    print("huge", end=" ")
print("done")
```

OUTPUT

18

```
n = 4
if n < 5:
    n = n * 3
if n < 5:
    n = n + 100
print(n)
```

OUTPUT

19

```
age = int(input("Age: "))
if age >= 18:
    print("You can vote")
else:
    print("Wait", 18 - age, "more
years")
```

The user types `14`

OUTPUT

20

```
password = input("Password: ")
if password == "cs17":
    print("Welcome!")
else:
    print("Wrong password")
```

The user types `CS17`

OUTPUT

Section C - if-elif-else

Write the output of each program. Remember: only the **first** true branch runs.

21

```
marks = 68
if marks >= 90:
    print("A")
elif marks >= 75:
    print("B")
elif marks >= 60:
    print("C")
else:
    print("D")
```

OUTPUT

22

```
marks = 95
if marks >= 90:
    print("A")
elif marks >= 75:
    print("B")
elif marks >= 60:
    print("C")
```

OUTPUT

23

```
marks = 95
if marks >= 90:
    print("A")
if marks >= 75:
    print("B")
if marks >= 60:
    print("C")
```

OUTPUT

24

```
n = 0
if n > 0:
    print("Positive")
elif n < 0:
    print("Negative")
else:
    print("Zero")
```

OUTPUT

25

```
marks = 95
if marks >= 40:
    print("Pass")
elif marks >= 90:
    print("Top of the class")
else:
    print("Fail")
```

OUTPUT

26

```
light = "yellow"
if light == "red":
    print("Stop")
elif light == "green":
    print("Go")
print("Done")
```

OUTPUT

27

```
n = 15
if n % 3 == 0:
    print("Fizz")
elif n % 5 == 0:
    print("Buzz")
elif n % 3 == 0 and n % 5 == 0:
    print("FizzBuzz")
```

OUTPUT

28

```
units = 250
if units <= 100:
    bill = units * 5
elif units <= 200:
    bill = 500 + (units - 100) * 7
else:
    bill = 1200 + (units - 200) * 10
print("Bill: Rs.", bill, sep="")
```

OUTPUT

29

```
day = 6
if day == 1:
    print("Monday")
elif day == 6 or day == 7:
    print("Weekend!")
else:
    print("School day")
```

OUTPUT

30

```
x = 5
if x > 3:
    x = 1
elif x < 3:
    x = 100
print(x)
```

OUTPUT

31

```
t = float(input("Temperature: "))
if t >= 37.5:
    print("Fever")
elif t >= 36.1:
    print("Normal")
else:
    print("Low")
```

The user types `37.5`

OUTPUT

Section D - Nested if, and, or, not

Write the output of each program. Watch the indentation: it shows which `if` an `else` belongs to.

32

```
a = 8
b = 15
c = 11
if a >= b and a >= c:
    print("Largest:", a)
elif b >= c:
    print("Largest:", b)
else:
    print("Largest:", c)
```

OUTPUT

33

```
age = 15
has_ticket = True
if has_ticket:
    if age >= 18:
        print("Enter")
    else:
        print("Enter with an adult")
else:
    print("Buy a ticket first")
```

OUTPUT

34

```
x = 5
y = 10
if x > 3:
    if y > 20:
        print("A")
    else:
        print("B")
print("C")
```

OUTPUT

35

```
x = 5
y = 10
if x > 3:
    if y > 20:
        print("A")
else:
    print("B")
print("C")
```

OUTPUT

36

```
year = 1900
if year % 4 == 0:
    if year % 100 == 0:
        if year % 400 == 0:
            print("Leap")
        else:
            print("Not leap")
    else:
        print("Leap")
else:
    print("Not leap")
```

OUTPUT

37

```
year = 2000
if (year % 4 == 0 and year % 100 != 0)
or year % 400 == 0:
    print(year, "is a leap year")
else:
    print(year, "is not a leap year")
```

OUTPUT

38

```
x = -3
y = 4
if x > 0 and y > 0:
    print("Quadrant 1")
elif x < 0 and y > 0:
    print("Quadrant 2")
elif x < 0 and y < 0:
    print("Quadrant 3")
elif x > 0 and y < 0:
    print("Quadrant 4")
else:
    print("On an axis")
```

OUTPUT

39

```
a = 3
b = 4
c = 8
if a + b > c and b + c > a and a + c >
b:
    print("Valid triangle")
else:
    print("Not a triangle")
```

OUTPUT

40

```
a = 5
b = 5
c = 8
if a == b and b == c:
    print("Equilateral")
elif a == b or b == c or a == c:
    print("Isosceles")
else:
    print("Scalene")
```

OUTPUT

Section E - One program, many runs

The program is run more than once. Each time the user types different values. Write the output of **each** run.

41

```
n = int(input("n: "))
if n % 3 == 0 and n % 5 == 0:
    print("FizzBuzz")
elif n % 3 == 0:
    print("Fizz")
elif n % 5 == 0:
    print("Buzz")
else:
    print(n)
```

Run 1
The user types `9`

OUTPUT

Run 2
The user types `10`

OUTPUT

Run 3
The user types `15`

OUTPUT

Run 4
The user types `7`

OUTPUT

42

```
marks = int(input("Marks: "))
if marks >= 90:
    print("Grade A")
elif marks >= 40:
    print("Grade B")
else:
    print("Fail")
```

Run 1
The user types `90`

OUTPUT

Run 2
The user types `89`

OUTPUT

Run 3
The user types `39`

OUTPUT

43

```
a = int(input())
op = input()
b = int(input())
if op == "+":
    print(a + b)
elif op == "-":
    print(a - b)
elif op == "/":
    if b == 0:
        print("Cannot divide by zero")
    else:
        print(a / b)
else:
    print("Unknown operator")
```

Run 1

The user types `9` then `/` then `2`

OUTPUT

Run 2

The user types `8` then `/` then `0`

OUTPUT

Run 3

The user types `6` then `x` then `3`

OUTPUT

44

```
age = int(input("Age: "))
if age < 5:
    print("Free")
elif age <= 12:
    print("Child: Rs.50")
elif age >= 60:
    print("Senior: Rs.60")
else:
    print("Adult: Rs.100")
```

Run 1

The user types `4`

OUTPUT

Run 2

The user types `12`

OUTPUT

Run 3

The user types `35`

OUTPUT

Run 4

The user types `60`

OUTPUT

45

```
ch = input("Letter: ")
if ch == "a" or ch == "e" or ch == "i"
or ch == "o" or ch == "u":
    print(ch, "is a vowel")
else:
    print(ch, "is a consonant")
```

Run 1

The user types `e`

OUTPUT

Run 2

The user types `E`

OUTPUT

Run 3

The user types `k`

OUTPUT

46

```
user = input("User: ")
pin = int(input("PIN: "))
if user == "riya":
    if pin == 1234:
        print("Welcome, riya")
    else:
        print("Wrong PIN")
else:
    print("No such user")
```

Run 1

The user types `riya` then `1234`

OUTPUT

Run 2

The user types `riya` then `4321`

OUTPUT

Run 3

The user types `aman` then `1234`

OUTPUT

47

```
amount = int(input("Amount: "))
if amount >= 1000:
    amount = amount - amount * 10 /
100
elif amount >= 500:
    amount -= 50
print("Pay", amount)
```

Run 1

The user types `1200`

OUTPUT

Run 2

The user types `500`

OUTPUT

Run 3

The user types `300`

OUTPUT

Section F - Find the error

Each program stops with an error before it can finish. Write the name of the error (for example `SyntaxError`), then rewrite the wrong line so it works.

48

```
n = 5
if n > 3
    print("big")
```

ERROR NAME

FIXED LINE

49

```
n = 5
if n > 3:
print("big")
```

ERROR NAME

FIXED LINE

50

```
n = 5
if n = 5:
    print("five")
```

ERROR NAME

FIXED LINE

51

```
n = -2
if n > 0:
    print("positive")
else if n < 0:
    print("negative")
```

ERROR NAME

FIXED LINE

52

```
age = input("Age: ")
if age >= 18:
    print("Adult")
```

The user types `20`

ERROR NAME

FIXED LINE

53

```
x = 4
if x > 5:
    print("big")
else x <= 5:
    print("small")
```

ERROR NAME

FIXED LINE

54

```
x = 7
if x > 5 and < 10:
    print("between 5 and 10")
```

ERROR NAME

FIXED LINE

55

```
x = 7
if x > 5:
    print("big")
  print("really big")
```

ERROR NAME

FIXED LINE

56

```
x = 4
if x > 5:
    print("big")
else:
    print("small")
elif x == 5:
    print("five")
```

ERROR NAME

FIXED LINE

Section G - Find the bug

These programs run without an error, but they print the wrong thing. Find the wrong line and write the fix.

57

Print the grade: A for 80 or more, B for 60 or more, C for 40 or more, otherwise Fail.

```
marks = int(input("Marks: "))
if marks >= 40:
    print("Grade C")
elif marks >= 60:
    print("Grade B")
elif marks >= 80:
    print("Grade A")
else:
    print("Fail")
```

The user types `85`

SHOULD PRINT

```
Marks: 85
Grade A
```

BUT PRINTS

```
Marks: 85
Grade C
```

WRONG LINE

FIX

58

Print whether a number is even or odd.

```
n = int(input("n: "))
if n // 2 == 0:
    print("Even")
else:
    print("Odd")
```

The user types `6`

SHOULD PRINT

```
n: 6
Even
```

BUT PRINTS

```
n: 6
Odd
```

WRONG LINE

FIX

59

Anyone aged 18 or more can vote.

```
age = int(input("Age: "))
if age > 18:
    print("You can vote")
else:
    print("Too young")
```

The user types `18`

SHOULD PRINT

```
Age: 18
You can vote
```

BUT PRINTS

```
Age: 18
Too young
```

WRONG LINE

FIX

60

Print one word: Positive, Negative or Zero.

```
n = int(input("n: "))
if n > 0:
    print("Positive")
if n < 0:
    print("Negative")
else:
    print("Zero")
```

The user types `5`

SHOULD PRINT

```
n: 5
Positive
```

BUT PRINTS

```
n: 5
Positive
Zero
```

WRONG LINE

FIX

61

A teenager is 13 to 19 years old.

```
age = int(input("Age: "))
if age >= 13 or age <= 19:
    print("Teenager")
else:
    print("Not a teenager")
```

The user types `25`

SHOULD PRINT

```
Age: 25
Not a teenager
```

BUT PRINTS

```
Age: 25
Teenager
```

WRONG LINE

FIX

62

Print the largest of three numbers.

```
a = int(input("a: "))
b = int(input("b: "))
c = int(input("c: "))
if a > b:
    print(a)
elif b > c:
    print(b)
else:
    print(c)
```

The user types `5` then `2` then `9`

SHOULD PRINT

```
a: 5
b: 2
c: 9
9
```

BUT PRINTS

```
a: 5
b: 2
c: 9
5
```

WRONG LINE

FIX

Section H - Write a program

Write each program. Your program must print exactly what the sample run shows. In the sample run, **bold** text is what the user typed. Your program must work for **any** input, not only the sample.

63

Ask for a year. Print whether it is a leap year. A year is a leap year if it divides by 4 but not by 100, or if it divides by 400.

SAMPLE RUN

```
Year: 2024
2024 is a leap year
```

YOUR PROGRAM

64

Ask for three whole numbers. Print the largest.

SAMPLE RUN

```
a: 14
b: 27
c: 9
Largest: 27
```

YOUR PROGRAM

65

Ask for marks out of 100. Print the grade: A for 90 or more, B for 75 or more, C for 60 or more, D for 40 or more, otherwise F.

SAMPLE RUN

```
Marks: 78
Grade B
```

YOUR PROGRAM

66

Ask for the cost price and the selling price. Print the profit, the loss, or *No profit, no loss*.

SAMPLE RUN

```
Cost price: 450
Selling price: 380
Loss of Rs.70
```

YOUR PROGRAM

67

Electricity bill. The first 100 units cost Rs.5 each, the next 100 cost Rs.7 each, and every unit after 200 costs Rs.10. Ask for the units used and print the bill.

SAMPLE RUN

```
Units: 230
Bill: Rs.1500
```

YOUR PROGRAM

68

A calculator. Ask for a number, an operator (`+ - * /`) and another number, and print the answer. Print *Cannot divide by zero* or *Unknown operator* when needed.

SAMPLE RUN

```
First number: 7
Operator: *
Second number: 6
7.0 * 6.0 = 42.0
```

YOUR PROGRAM