Grade 8 Computing

Unit 2 · Decisions and Loops in Python

WORKSHEET

Full marks 32

Name _____ Class _____ Roll no. ____ Date _____ Marks _____ / 32

1 Key words [4]

Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

block	**condition**	**counter**	**elif**	**flag**	**infinite loop**	**iteration**	**loop variable**	**nested loop**
running total								

An if statement runs its indented _____ only when its _____ is `True`.

_____, short for "else if", adds more paths. Each time round a loop is one _____.

In `for i in range(5):`, `i` is the _____. A variable that starts at 0 and has each new value added to it is a _____; one that goes up by 1 each time something happens is a _____. A while loop whose condition never becomes `False` is an _____.

2 Multiple choice [5]

Choose the correct option for each of the following questions.

i. A program must count how many students in a class passed. Where does `passed = passed + 1` go? [1]

a. before the loop
b. inside the loop, inside an if that checks the student passed
c. inside the loop, but not inside an if
d. after the loop

ii. How many times does `for i in range(2, 12, 3):` go round? [1]

a. 3 **b.** 4
c. 10 **d.** 12

iii. Which line starts a loop that runs exactly 10 times? [1]

a. `for i in range(1, 10):` **b.** `for i in range(10):`
c. `for i in range(0, 10, 2):` **d.** `while i < 10:`

iv. A while loop's condition is `False` the first time it is checked. What happens? [1]

a. The body runs once. **b.** The body doesn't run at all.
c. Python stops with an error. **d.** The loop never ends.

v. Which loop fits best: "keep filling bottles from the tank until the tank is empty"? [1]

a. `for i in range(10):` **b.** `while water > 0:`
c. `if water > 0:` **d.** `for water in range(0):`

3 What does it print? [5]

Write exactly what each program prints, in the box under it.

a. [3]

```
1  for n in range(1, 6):
2      if n % 2 == 0:
3          print(n, "even")
4      elif n == 5:
5          print(n, "last")
6  print("Done")
```

OUTPUT

b. [2]

```
1  count = 0
2  for i in range(10, 0, -3):
3      print(i)
4      count = count + 1
5  print("Rounds:", count)
```

OUTPUT

4 Trace the program [4]

Fill in the trace table: one row for each time round the loop, then what the program prints. The first row shows the values before the loop.

```
1  a = 1
2  b = 0
3  while a < 20:
4      b = b + 1
5      a = a * 3
6  print(a, b)
```

Round	a < 20?	b	a	Output
(before)		0	1	

5 Find and fix the bug [3]

Read the program, then answer.

This program should print the even numbers from 2 to 10, but it never stops.

```
1  n = 2
2  while n != 11:
3      print(n)
4      n = n + 2
```

i. Why does it never stop?
ii. Write line 2 correctly, so that the while loop stops after 10.
iii. Write the program again with a `for` loop.

6 Write a program [4]

Write the program in Python on the lines. Any program that gives the right result gets the marks.

Write a program that asks for the marks of 5 students, one at a time, then prints how many passed (35 or more) and the average. For 72, 30, 58, 90 and 34: `Passed: 3` and `Average: 56.8`.

7 Short answers [2]

Write short answers to the following questions.

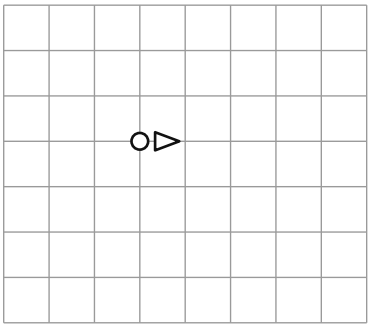
What is the difference between `if … elif … else` and several separate `if`s? For `marks = 95`, what does each of these set **grade** to: i. `if marks >= 90: grade = "A+"` then `elif marks >= 80: grade = "A"`; ii. the same two lines with `if` in place of `elif`?

Science Playground, Katunje, Bhaktapur
https://science-playground.com/learn/grade-8-computing/decisions-and-loops-in-python

8 Draw what the turtle draws [3]

The turtle starts at ○, facing the way the arrow points (right). One square is 25 steps. Draw on the squared paper what the program draws, and draw an arrowhead where the turtle ends, pointing the way it faces.

```
1 import turtle
2 t = turtle.Turtle()
3 for i in range(1, 6):
4     t.forward(i * 25)
5     t.right(90)
```



One square is 25 steps. ○ is where the turtle starts; the arrow shows the way it faces.

9 Think [2]

Think, then answer.

A shopkeeper has 50 kg of rice and sells 7 kg a day. A program takes 7 away again and again in a while loop (`while rice >= 7:`), counting the days, and prints `Full days: 7` and `Left over: 1 kg`. How could you get both answers in one line each, with no loop? Why do the two ways always agree?

10 Activity: Prayer flags (not marked)

At a computer, open the unit's page (the QR code) and find the activity **Prayer flags**. Before you run your program, fill in the table: `i % 5`, and the flag's color for each `i`. Then run it and check.

`i`	`i % 5`, and the color	`i`	`i % 5`, and the color
0		5	
1		6	
2		7	
3		8	
4		9	