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Q. 1) Explain the difference between a list & a tuple in python. Provide an example for each.

- In python, tuples are allocated large blocks of memory with lower overhead, since they are immutable. eg. (1,0,9,9,10) - tuple containing 3 numeric objects
- In python, lists are allocated small memory blocks ~~are also~~ since they are mutable.

eg. tuple = (1,2,3,4,5) print (tuple).

eg. list = [1,2,3,4] print (list)

Q. 2) Describe the purpose of the set data type in python. Provide an example to illustrate its use.

- Set data type is used to store multiple items in a single variable.
- suppose we want to store information about student IDs. since Student IDs cannot be duplicate, we can use a set.

student_id = {1,2,3,4,5}

Q. 3) What is the key difference between a float & an integer data type in python? Give an example where using a float would be more appropriate.

- Integers are numbers without a decimal point, whereas floats are numbers with a decimal point.

- Integers are immutable, so once created their value cannot be changed.

- floating point no. represent real no. have fraction.

Q. 4) How does the dictionary data type in python differ from lists & tuples? Provide an example of a dictionary & explain its structure.

- 1) Tuples are unordered.
- 2) Dictionaries are ordered.
- 3) The list & tuples can be created by using the elements without any defining the key whereas the dictionary uses the key & value points.

Q. 5) What is doc testing & use of this string in python.

- 1) A python doc string is a string used to document a python module, class, fun' or method.
- 2) Programmers can understand what is does without having to read the details of the implementing.
- 3) Also, it is a common practice to generate online documentation automatically from doestings.

Q. 6) Explain the purpose of the // operator in python. Provide an example to illustrate its use.

- - Floor division (//) operator used to divides & returns the integer value of the quotient.
- It drops the digits after the decimal.
- eg $10 // 3 = 3$

Q. 7) Differentiate between the == & is operators in python. provide examples to demonstrate their usage.

- 1) when comparing objects in python

$==$ operator helps to use.

2) The `is` operator helps us check whether different variables point towards a similar object in the memory.

Q. 8) What is the use of the `+=` operator in python?
Provide an example to demonstrate its functionality.

- 1) The plus - equals operator `+=` provides a convenient way to add a value to an existing variable & assign the new value back to the same variable.
- 2) In the case where the variable & the value are strings, this operator performs string concatenation instead of addition.

Q. 9) Discuss the role of the `in` operator in python. Provide an example to demonstrate its functionality.

- 1) The `in` operator in python is used to check if a value exists in a sequence like list, tuple or string.
- 2) eg. `list = [1, 2, 3, 4]`
`print (4 in list)`

Q. 10) Explain the concept of the ternary operator (`x if condition else y`) in python. Provide an example scenario where it can be employed.



- Q. 10) The ternary operator in python is one like short hand for an if else statement.
- It allows you to quickly test a condition & return a value based on whether that condition is true or false.
 - In this eg., the condition $x \% 2 == 0$ checks if the number x is even. If it is, the string 'Even' is printed.

- Q. 11) What is the purpose of the if statement in python? Provide an example demonstrating the use of an if statement.
- 1) An if statement is a condition statement used to check a condition, & execute it if the condition holds true.
- 2) It is also a control flow statement, which utilizes decision-making to control the flow of execution.
- 3) Eg. if statement to check if a no. is tve.

`num = 5`

`if num > 0:`

`print ("The no. is positive.")`

- Q. 12) Describe the difference between while & for loops in python. Give an example for each loop type.

- 1) For loops are designed for iterating over a sequence of items. Eg. list, tuple, etc
- 2) while loop is used when the no. of iterations is not known in advance or when we want

→ to repeat a block of code until a certain condition is met.

Q. 12)

Q. 13) Explain the significance of the break statement in python. Provide a scenario where using break is appropriate

- 1) The break statement terminates the execution of the nearest enclosing do for switch for while statement.
- 2) Allows you to exit a loop when an external condition is met.

3) eg.

```
for i in range(10)
```

```
    print(i)
```

```
    if i == 2
```

```
        break.
```

Q. 14)

Discuss the role of the continue statement in python. Provide a code snippet demonstrating its use.

- 1) In python continue statement skips the execution of the program block after the continue statement & forces the control to start the next iteration

2) syntax

```
while True:
```

```
    ...
```

```
    if x == 10:
```

```
continue
```

```
print(x)
```

3) Demonstration of continue statement in Python.

```
for var in "loop":
```

```
    if var == "o":
```

```
        continue
```

```
    print(var)
```

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Q. 15) How does the else clause in a loop contribute to the control flow in python? Provide an eg. illustrating the use of the else clause in a loop.

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- 1) Python enables an else clause at the end of a for loop.
 - 2) The else part is executed if the loop terminates naturally.
 - 3) In the above example, the for loop is executed first.
 - 4) After that, the else part is executed.