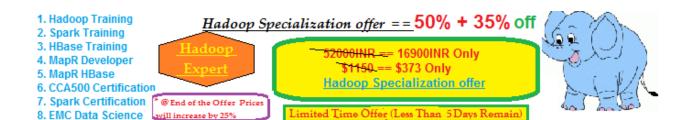1. **Apache Spark Professional Training with Hands On Lab Sessions**
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MODULE-9 PYTHON TUPLE

By www.HadoopExam.com
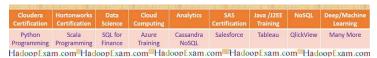
Note: These instructions should be used with the HadoopExam Apache Spark: Professional Trainings. Where it is executed and you can do hands on with trainer.

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1. About Pythin tuple?
2. Creating tuples
3. Tuple Assignment
4. List and tuples
5. Dictionary and tuples

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About tuples: Tuples are immutable: A tuple is a sequence of values. The values can be any type, and they are indexed by integers, so in that respect tuples are a lot like lists. The important difference is that tuples are immutable.

```
course = 'Hadoop', 'Spark', 'Python'
print (course)
```

Step 1: Creating a tuple with single element, we have to provide ',' after the element.

```
course = 'Hadoop',
print (course)
type(course)

#A value in parentheses is not a tuple
course = ('Hadoop')
type(course)

#Another way to create a tuple is the built-in function tuple. With no argument, it creates an empty tuple
course = tuple()
course
type(course)
```

Step 2: Creating tuple using sequence

```
# If the argument is a sequence for example string, list or tuple, the result is a tuple with the elements of the sequence
t1 = tuple('Hadoop')
t2 = tuple(['Hadoop','Spark', 'Python'])
t3 = tuple(('Hadoop','Spark', 'Python'))

print(t1)
print(t2)
print(t3)
```

Step 3: Most list operators also work on tuples. The bracket operator indexes an element.

```
t1[0]
t1[1:3]

#if you try to modify one of the elements of the tuple, you get an error
t1[0] = 'S'
```

Step 4: Because tuples are immutable, you can't modify the elements. But you can replace one tuple with another

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```
t1 = ('S',) + t1[1:]
print(t1)
```

Step 5: The relational operators work with tuples and other sequences; Python starts by comparing the first element from each sequence. If they are equal, it goes on to the next elements, and so on, until it finds elements that differ. Subsequent elements are not considered (even if they are really big).

```
(0, 1, 2) < (0, 3, 4)
(0, 1, 2000000) < (0, 3, 4)
```

Step 6: **Tuple Assignment**: The return value from split is a list with two elements; the first element is assigned to course_name, the second to fee.

```
course_detail = 'Hadoop:3900'
course_name, fee = course_detail.split(':')

print(course_name, fee)

#Try below
a, b = 1, 2, 3
```

Step 7: Tuple as return value

1. A function can only return one value, but if we wanted to return more than one value than we return as tuple.
2. The built-in function divmod takes two arguments and returns a tuple of two values, the quotient and remainder.

```
fee=tuple((3900,2900,3000,2500))
def min_max(t):
        return min(t), max(t)

print (min_max(fee))
```

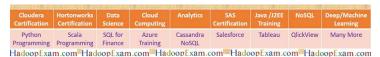**Step 8**: Variable length argument tuples

1. Functions can take a variable number of arguments. A parameter name that begins with * gathers arguments into a tuple.
2. Many of the built-in functions use variable-length argument tuples. For example, max and min can take any number of arguments

```
def printallCourses(*args):
        print(args)

printallCourses('Hadoop','Spark', 'Python')
```

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Step 9: **List and tuples**: zip is a built-in function that takes two or more sequences and returns a **list of tuples** where each tuple contains one element from each sequence. The name of the function refers to a zipper, which joins and interleaves two rows of teeth.

```
s = ('Hadoop','Spark', 'Python')
t = (3900,2900,3000,2500)
zip(s, t)
```

Step 10: Check whether all the values in two tuples are same or not.

```
def all_match(t1, t2):
        for x, y in zip(t1, t2):
                if x == y:
                        continue
                else:
                        return False
        return True

t2 = tuple(['Hadoop','Spark', 'Python'])
t3 = tuple(('Hadoop','Spark', 'Python'))

all_match(t2,t3)
```

Step 11: Print sequence and its index value as well.

Note: The result from enumerate is an enumerate object, which iterates a sequence of pairs; each pair contains an index (starting from 0) and an element from the given sequence.

```
for index, element in enumerate('abc'):
        print(index, element)
```

Step 12: **Dictionary and tuples**: Dictionaries have a method called items that returns a sequence of tuples, where each tuple is a key-value pair

```
course = {'Hadoop':3500,'Spark':3500, 'Python':0}
t = course.items()
print(t)

#Now you can use it in loop
for name, fee in course.items():
        print( name, fee )
```

Step 13: It is common to use tuples as keys in dictionaries (primarily because you can't use lists). For example, a telephone directory might map from last-name, first-name pairs to telephone numbers. Assuming that we have defined last, first and number, we could write

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```
d = dict()
d['Spark', 'Hadoop']= 3900
d['Python', 'Machine Learning']= 4000
d['AWS', 'Cloud Computing']= 4500
d['Java', 'J2EE']= 5000

for course1, course2 in d:
        print(course1, course2, d[course1, course2])
```

Remember:

1. Lists are more common than tuples, mostly because they are mutable.
   Prefer tuples:
2. Like a return statement, it is syntactically simpler to create a tuple than a list.
3. If you want to use a sequence as a dictionary key, you have to use an immutable type like a tuple or string.
4. If you are passing a sequence as an argument to a function, using tuples reduces the potential for unexpected behavior due to aliasing.
5. Because tuples are immutable, they don't provide methods like sort and reverse, which modify existing lists. But Python provides the built-in function sorted, which takes any sequence and returns a new list with the same elements in sorted order, and reversed, which takes a sequence and returns an iterator that traverses the list in reverse order.

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