QUESTIONS BASED ON PANDAS SERIES

Questions **Solutions**

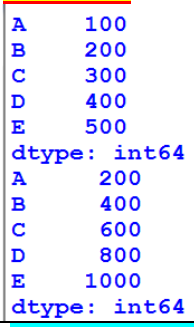
Q.1- Given the following Series1

A	100
B	200
C	300
D	400
E	500

Write the command to create above Series and then double the value in series and store in another series named Series2

```
import pandas as pd
Series1=pd.Series([100,200,300,400,500],index=['A','B','C','D','E'])
Series2=Series1*2
print(Series1)
print(Series2)
```

OUTPUT



```
A     100
B     200
C     300
D     400
E     500
dtype: int64
A      200
B      400
C      600
D      800
E     1000
dtype: int64
```

Q.2- State whether True or False

a. A series object is size mutable.
b. A Dataframe object is value mutable

a. A series object is size mutable. **(False)**
b. A Dataframe object is value mutable **(True)**

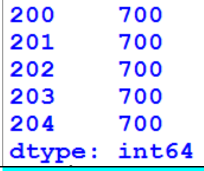
Q.3- Consider a given Series , Series1:

```
200     700
201     700
202     700
203     700
204     700
```

Write a program in Python Pandas to create the series and display it.

```
import pandas as pd
Series1=pd.Series(700,index=range(200,205))
print(Series1)
```

OUTPUT



```
200     700
201     700
202     700
203     700
204     700
dtype: int64
```

Q.4- Consider the following Series object, s

```
IP              95
Physics         89
Chemistry       92
Math            95
```

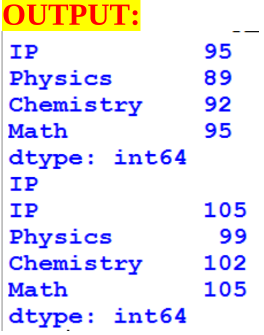
i. Write the Python syntax which will display only IP.

ii. Write the Python syntax to increase marks of all subjects by 10.

```
import pandas as pd
s=pd.Series([95,89,92,95],index=['IP','Physics','Chemistry','Math'])
print(s.index[0])
s=s+10
print(s)
```

ANSWER:
i) series_object.index[index number]
ii) series_object=series_object+10

OUTPUT:



```
IP             95
Physics        89
Chemistry      92
Math           95
dtype: int64
IP
IP            105
Physics        99
Chemistry     102
Math          105
dtype: int64
```

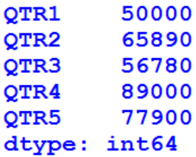
Q.5- Consider a given series : SQTR

QTR1	50000
QTR2	65890
QTR3	56780
QTR4	89000
QTR5	77900

Write a program in Python Pandas to create and display the series.

```
import pandas as pd
val1=[50000,65890,56780,89000,77900]
idx=['QTR1','QTR2','QTR3','QTR4','QTR5']
SQTR=pd.Series(val1,index=idx)
print(SQTR)
```

OUTPUT:

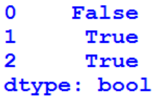


```
QTR1     50000
QTR2     65890
QTR3     56780
QTR4     89000
QTR5     77900
dtype: int64
```

Q.6- What will be the output produced by the following programming statements 1 & 2?

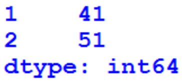
```
import pandas as pd
S1=pd.Series(data=[31,41,51])
print(S1>40)          -->Statement1
print(S1[S1>40])      -->Statement2
```

Statement1-



```
0     False
1      True
2      True
dtype: bool
```

Statement2-



```
1     41
2     51
dtype: int64
```

Q.7- Given two series S1 and S2

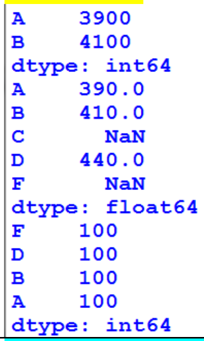
S1		**S2**	
A	39	A	10
B	41	B	10
C	42	D	10
D	44	F	10

Find the output for following python pandas statements?

a. S1[: 2]*100
b. S1 * S2
c. S2[: : -1]*10

```
import pandas as pd
S1=pd.Series([39,41,42,44],index=['A','B','C','D'])
S2=pd.Series(10,index=['A','B','D','F'])
print(S1[ : 2]*100)
print(S1 * S2)
print(S2[ : : -1]*10)
```

OUTPUT:



```
A     3900
B     4100
dtype: int64
A     390.0
B     410.0
C       NaN
D     440.0
F       NaN
dtype: float64
F     100
D     100
B     100
A     100
dtype: int64
```

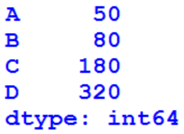
Q.8- Given the following Series S1 and S2:

S1		**S2**	
A	10	A	5
B	20	B	4
C	30	C	6
D	40	D	8

Write the command to find the multiplication of series S1 and S2

```
import pandas as pd
S1=pd.Series([10,20,30,40],index=['A','B','C','D'])
S2=pd.Series([5,4,6,8],index=['A','B','C','D'])
print(S1*S2)
```

OUTPUT:



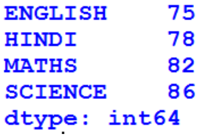
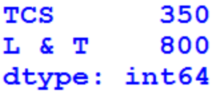
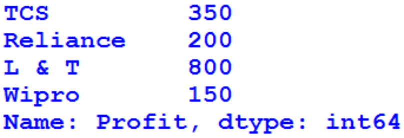
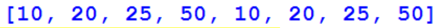
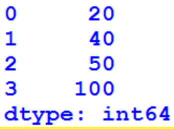
```
A      50
B      80
C     180
D     320
dtype: int64
```

Q.9- Consider a given Series , Subject:

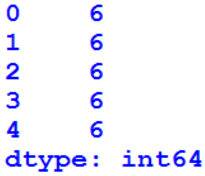
ENGLISH	75
HINDI	78
MATHS	82
SCIENCE	86

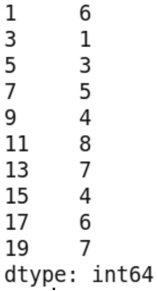
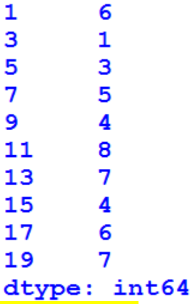
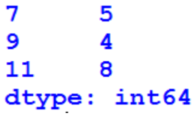
Write a program in Python Pandas to create this series

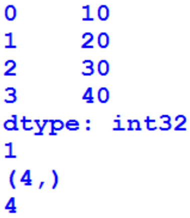
```
import pandas as pd
mrk=[75,78,82,86]
idx=['ENGLISH','HINDI','MATHS','SCIENCE']
Subject=pd.Series(mrk,index=idx)
print(Subject)
```

		OUTPUT:  ENGLISH 75 HINDI 78 MATHS 82 SCIENCE 86 dtype: int64
Q.10-	Consider the following Series object, “company” and its profit in Crores TCS 350 Reliance 200 L&T 800 Wipro 150 i. Write the command which will display the name of the company having profit>250. ii. Write the command to name the series as Profit.	import pandas as pd profit=[350,200,800,150] idx=['TCS','Reliance','L & T','Wipro'] company=pd.Series(profit,index=idx) print(company[company>250]) company.name="Profit" print(company) **OUTPUT:**  TCS 350 L & T 800 dtype: int64  TCS 350 Reliance 200 L & T 800 Wipro 150 Name: Profit, dtype: int64
Q.11-	Consider two objects a and b. **a** is a list whereas **b** is a Series. Both have values 10,20,25,50. What will be the output of the following two statements considering that the above objects have been created already a. print(a*2) b. print(b*2) Justify your answer.	import pandas as pd a=[10,20,25,50] b=pd.Series([10,20,25,50]) print(a*2) print(b*2) **OUTPUT:** Option a) will produce  [10, 20, 25, 50, 10, 20, 25, 50] Option b) will produce  0 20 1 40 2 50 3 100 dtype: int64 **Justification:** In Option a) list elements is repeated two times, because a list is replicated when multiplied by any number, it does not allowed vector operation. In Option b) Series allows vector operation, that is why each element of the series has been multiplied by 2.

Q.12-	Given a Pandas series called Sample, the command which will display the last 3 rows is . a. print(Sample.tail(3)) b. print(Sample.Tail(3)) c. print(Sample.tails(3) d. print(Sample.Tails(3))	**Correct Answer:** a. print(Sample.tail(3))

Q.13-	What will be the output of the following code?
	import pandas as pd
	s = pd.Series(6,index=range(0,5))
	print(s)
		OUTPUT:
		
		0 6
		1 6
		2 6
		3 6
		4 6
		dtype: int64

Q.14-	If series s1 is having following data,  1 6 3 1 5 3 7 5 9 4 11 8 13 7 15 4 17 6 19 7 dtype: int64 What would be the result of the command **print(s1[3:6])**?	import pandas as pd s1=pd.Series([6,1,3,5,4,8,7,4,6,7],index=range(1,20,2)) print(s1)  1 6 3 1 5 3 7 5 9 4 11 8 13 7 15 4 17 6 19 7 dtype: int64 **OUTPUT:** print(s1[3:6])  7 5 9 4 11 8 dtype: int64

Q.15-	What will be the output of the following code?
	import pandas as pd
	import numpy as np
	s = pd.Series(np.arange(10,50,10))
	print(s)
	print (s.ndim)
	print(s.shape)
	print(len(s))
		OUTPUT:
		
		0 10
		1 20
		2 30
		3 40
		dtype: int32
		1
		(4,)
		4

Q.16-	Write a program to create a Series having 10 random numbers in the range of 10 and 20	import pandas as pd
		import random
		lst=[ ]
		for x in range(10):
		    num=random.randint(10,20)
		    lst.append(num)
		s = pd.Series(lst)
		print(s)

OUTPUT:

```
0     20
1     19
2     18
3     13
4     19
5     12
6     16
7     17
8     11
9     11
dtype: int64
```

Q.17- Consider the following Series ‘s’-

```
0     4.0
1     5.0
2     7.0
3     NaN
4     1.0
5     10.0
dtype: float64
```

(i) Write a Python code to add 1 to all the elements.

(ii) Write a code to replace all NaN with 0.

```
import pandas as pd
import numpy as np
s = pd.Series([4,5,7,np.nan,1,10])
print(s)
# add 1 to the series
s=s+1
print(s)
s=s.fillna(0)
print(s)
```

```
0      4.0
1      5.0
2      7.0
3      NaN
4      1.0
5     10.0
dtype: float64
0      5.0
1      6.0
2      8.0
3      NaN
4      2.0
5     11.0
dtype: float64
0      5.0
1      6.0
2      8.0
3      0.0
4      2.0
5     11.0
dtype: float64
```

Q.18- Predict the output of the following code.

```
import pandas as pd
import numpy as np
data = {'one':'a','two':'b','three':'c'}
s=pd.Series(data)
print(s)
print(s.size)
```

OUTPUT:

```
one      a
two      b
three    c
dtype: object
3
```

Q.19- Create a Series object S1 using a python sequence [2,4,6,8] and default indices.

```
import pandas as pd
data = range(2,10,2)
S1=pd.Series(data)
print(S1)
```

OUTPUT:

```
0     2
1     4
2     6
3     8
dtype: int64
```

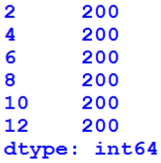
Q.20- Write the output of the following code fragment.

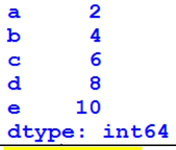
```
import pandas as pd
s2=pd.Series(["i","am", "a","student"])
print(s2)
```

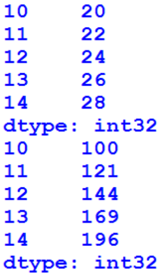
OUTPUT:

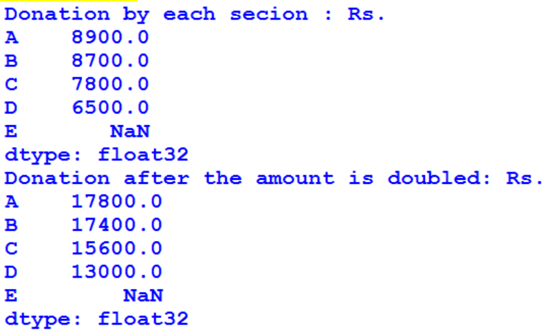
```
0          i
1         am
2          a
3    student
dtype: object
```

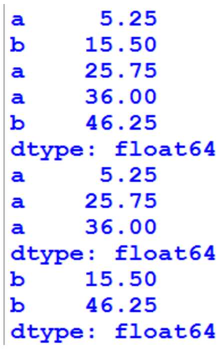
	QUESTIONS BASED ON PANDAS SERIES (Part-2)	

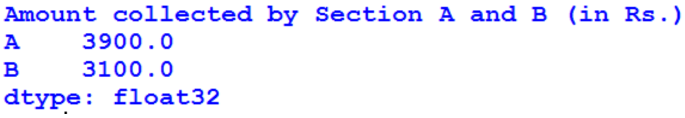
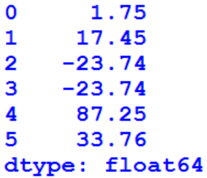
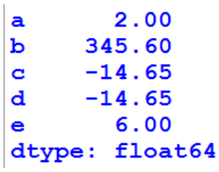
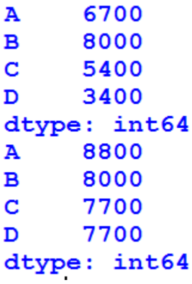
Q.21-	Write the output of the following code fragment.
	import pandas as pd
	s1=pd.Series(200,index=range(2,13,2))
	print(s1)
		OUTPUT:
		
		2 200
		4 200
		6 200
		8 200
		10 200
		12 200
		dtype: int64

Q.22-	Write the output of the following code fragment. import pandas as pd s1=pd.Series(range(2,11,2), index=[x for x in "abcde"]) print(s1)	**OUTPUT:**  a 2 b 4 c 6 d 8 e 10 dtype: int64

Q.23-	Write the output of the following code fragment.
	import pandas as pd
	import numpy as np
	x=np.arange(10,15)
	s3=pd.Series(index=x, data=x*2)
	s4=pd.Series(x**2,x)
	print(s3)
	print(s4)
		OUTPUT:
		
		10 20
		11 22
		12 24
		13 26
		14 28
		dtype: int32
		10 100
		11 121
		12 144
		13 169
		14 196
		dtype: int32

Q.24-	Sequences section and contribution store the section name ('A','B','C','D','E') and contribution (8900,8700,7800,6500,nil) for charity. Your school has decided to donate more contribution by each section, so donation has been doubled. Write code to create series object that stores the contribution amount as the values and section name as indexes with data type as float32.	import pandas as pd import numpy as np idx=['A','B','C','D','E'] contr=[8900,8700,7800,6500,None] s1=pd.Series(data=contr, index=idx,dtype=np.float32) print("Donation by each secion : Rs.") print(s1) print("Donation after the amount is doubled: Rs.") print(s1*2) **OUTPUT:**  Donation by each secion : Rs. A 8900.0 B 8700.0 C 7800.0 D 6500.0 E NaN dtype: float32 Donation after the amount is doubled: Rs. A 17800.0 B 17400.0 C 15600.0 D 13000.0 E NaN dtype: float32

Q.25-	Write the output of the following code fragment.
	import pandas as pd
	import numpy as np
	val1=np.arange(5.25,50,10.25)
	ser1=pd.Series(val1,index=['a','b','a','a','b'])
	print(ser1)
	print(ser1['a'])
	print(ser1['b'])
		OUTPUT:
		
		a 5.25
		b 15.50
		a 25.75
		a 36.00
		b 46.25
		dtype: float64
		a 5.25
		a 25.75
		a 36.00
		dtype: float64
		b 15.50
		b 46.25
		dtype: float64

Q.26-	Consider a series object s10 that stores the number of students in each section of class 12 as shown below. First two sections have been given task for selling tickets @ Rs.100/- per ticket as a part of social experiment. Write code to create the series and display how much section A and B have collected. A 39 B 31 C 32 D 34 E 35	import pandas as pd import numpy as np S10=pd.Series([39,31,32,34,35],index=['A','B','C','D','E'], dtype=np.float32) print("Amount collected by Section A and B (in Rs.)") print(S10.head(2)*100) **OUTPUT:**  Amount collected by Section A and B (in Rs.) A 3900.0 B 3100.0 dtype: float32
Q.27-	Consider the series s4 as given below 0 2.50 1 17.45 2 20.25 3 87.25 4 33.76 What will be the output after executing the following: S4[0]=1.75 S4[2:4]= -23.74 print(S4)	import pandas as pd S4=pd.Series([2.50,17.45,20,25,87.25,33.76]) S4[0]=1.75 S4[2:4]= -23.74 print(S4) **OUTPUT:**  0 1.75 1 17.45 2 -23.74 3 -23.74 4 87.25 5 33.76 dtype: float64
Q.28-	Consider the following code- import pandas s1=pandas.Series([2,3,4,5,6],index=['a','b','c','d','e']) s1[1:5:2]=345.6 s1[2:4]= -14.65 print(s1) What will be the output after executing the code.	**OUTPUT:**  a 2.00 b 345.60 c -14.65 d -14.65 e 6.00 dtype: float64
Q.29-	Consider the Series object s12 that stores the contribution of each section, as shown below: A 6700 B 8000 C 5400 D 3400 Write code to modify the amount of section 'A' as 8800 and for section 'C' and 'D' as 7700. Print the changed object.	import pandas as pd import numpy as np idx=['A','B','C','D','E'] contr=[6700,8000,5400,3400] s12=pd.Series(contr, idx) print(s12) s12['A']=8800 s12[['C','D']]=7700 **#or** s12.loc['C':'D']=7700 print(s12) **OUTPUT:**  A 6700 B 8000 C 5400 D 3400 dtype: int64 A 8800 B 8000 C 7700 D 7700 dtype: int64

Q.30	A Series object trainingdata consists of 2000 rows of data. Write a program to print (i) First 100 rows of data (ii) Last 5 rows of data	import pandas as pd
		trainingdata=pd.Series(275.50,index=range(2000)
		# i)
		print(trainingdata.head(100))
		#ii)
		print(trainingdata.tail(5))

Q.31- Consider the following Series s3-

a	1.5
b	3.0
c	4.5
d	6.0
e	7.5

Now create the above series and find the output of the following commands-

i) print(s3+3)   ii) print(s3*2)

iii) print(s3>3.0)   iv) print(s3[s3>3.0])

```
import pandas as pd
s3=pd.Series([1.5,3.0,4.5,6.0,7.5],[x for x in 'abcde'])
print(s3+3)
print(s3*2)
print(s3>3.0)
print(s3[s3>3.0])
```

OUTPUT:

```
a      4.5
b      6.0
c      7.5
d      9.0
e     10.5
dtype: float64
a      3.0
b      6.0
c      9.0
d     12.0
e     15.0
dtype: float64
a     False
b     False
c      True
d      True
e      True
dtype: bool
c     4.5
d     6.0
e     7.5
dtype: float64
```

Q.32- Consider the Series object s12 that stores the contribution of each section, as shown below:

A	6700
B	8000
C	5400
D	3400

Write code to create the series and display those sections that made the contribution more than Rs. 5600/-

```
import pandas as pd
idx=[ 'A','B','C','D']
contr=[6700,8000,5400,3400]
s12=pd.Series(contr, idx)
print(s12[s12>5600])
```

OUTPUT:

```
A     6700
B     8000
dtype: int64
```

Q.33- Number of students in class 11 and 12 in three streams('Science', 'Commerce' and 'Humanities') are stored in two series objects c11 and c12. write code to find total number of students in class 11 and 12 , stream wise.

```
import pandas as pd
stream=['Science','Commerce','Humanities']
c11=pd.Series(data=[30,40,50],index=stream)
c12=pd.Series(data=[37,44,45],index=stream)
print("Total no. of students:")
print(c11+c12)   # Series arithmetic
```

OUTPUT:

```
Total no. of students:
Science       67
Commerce      84
Humanities    95
dtype: int64
```

Q.34- Consider the series s1 and s2 and s3-

S1		S2		S3	
0	10	0	5	a	3
1	20	1	10	b	6
2	30	2	15	c	9
3	40	3	20	d	10
4	50	4	25	e	11
		5	30		
		6	35		

Now find the output of the following-

i) print(S1+S2)

ii) print(S1*S3)

iii) print(S1-S2)

```
import pandas as pd
S1=pd.Series(data=[10,20,30,40,50],index=range(5))
S2=pd.Series(data=range(5,36,5),index=range(7))
S3=pd.Series(data=[3,6,9,10,11],index=[x for x in 'abcde'])
print(S1+S2)
print(S1*S3)
print(S1-S2)
```

OUTPUT:

```
0    15.0
1    30.0
2    45.0
3    60.0
4    75.0
5     NaN
6     NaN
dtype: float64
```

```
0    NaN
1    NaN
2    NaN
3    NaN
4    NaN
a    NaN
b    NaN
c    NaN
d    NaN
e    NaN
dtype: float64
```

```
0     5.0
1    10.0
2    15.0
3    20.0
4    25.0
5     NaN
6     NaN
dtype: float64
```

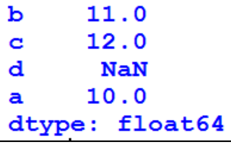
Q.35-	Consider the Series object s12 that stores the contribution of each section, as shown below:
	D 6700
	A 8000
	B 5400
	C 3400
	i) Write code to create the series and display all its values sorted in descending order.
	ii) Write code to display all its indices sorted in ascending order.
		import pandas as pd
		idx=['D','A','B','C']
		contr=[6700,8000,5400,3400]
		s12=pd.Series(contr, idx)
		# i)
		s12.sort_values(ascending=False)
		print(s12)
		#ii)
		s12.sort_index()
		print(s12)
		OUTPUT:
		A 8000
		D 6700
		B 5400
		C 3400
		dtype: int64
		A 8000
		B 5400
		C 3400
		D 6700
		dtype: int64

Q.36	**Given a Series object shown below:** A 6700 B 8000 C 5400 D 3400 dtype : int64 Why is following code producing error while working on Series object **s13**? import pandas as pd s13.index=range(0,5) print(s13)	This code is producing error because, object s13 has 4 elements only and the code line: s13.index=range(0,5) is trying to assign 5 index values to its elements: as range(0,5) produces 0,1,2,3,4 we can change the indexes of the Series object only when the new counting of indexes are same as original.

Q.37	**What will be the output of the following program:**
	import pandas as pd
	first=[7,8,9]
	second=pd.Series(first)
	s1=pd.Series(data=first*2)
	s2=pd.Series(data=second*2)
	print("Series1:")
	print(s1)
	print("Series2:")
	print(s2)
		OUTPUT:
		Series1:
		0 7
		1 8
		2 9
		3 7
		4 8
		5 9
		dtype: int64
		Series2:
		0 14
		1 16
		2 18
		dtype: int64

Q.38	**What is the output of the following program:**
	import pandas as pd
	import numpy as np
	data=np.array(['Mon','Tue','Wed','Thu','Fri','Sat','Sun'])
	s=pd.Series(data)
	print(s[:4])
	print(s[-4:])
		OUTPUT:
		0 Mon
		1 Tue
		2 Wed
		3 Thu
		dtype: object
		3 Thu
		4 Fri
		5 Sat
		6 Sun
		dtype: object

Q.39	**What is the output of the following program:**
	import pandas as pd
	import numpy as np
	data=np.array(['Mon','Tue','Wed','Thu','Fri','Sat','Sun'])
	s=pd.Series(data, index=[101,102,103,104,105,106,107])
	print(s[[103,105,107]])
		OUTPUT:
		103 Wed
		105 Fri
		107 Sun
		dtype: object

Q.40	**What will be the output of the following:**
	import pandas as pd
	D={'a':10,'b':11,'c':12}
	S=pd.Series(D,index=['b','c','d','a'])
	print(S)
		OUTPUT:
		
		`b    11.0`
		`c    12.0`
		`d     NaN`
		`a    10.0`
		`dtype: float64`