

Assignment- 1

MDSC-102

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1 . What is a variable in Python?

A variable is name or words which is used to refer the values (integer, float, strings etc). Generally, a meaningful variable is set to access the values which is stored in the memory for better understandings without giving some random letters like “a or b”.

Example:

Number1= 10

2 . How do you create a variable?

We can create the variable by giving the values after equal to sign (=) after typing the variable name. In python depending on the values compiler will decide whether the variable is int float or string etc example:

Example:

Count = 0 (In this example we create the integer variable “count”).)

3 . How do you check the value within a variable?

By printing the variable name using print function.

Example:

print(count)

4 . How do you create multiple variables in a single statement?

To create multiple variables in a single statement, we will use comma “,”.

Example:

number1, number2 = 1,2

5 . How do you create multiple variables with the same value?

To create multiple variables with the same values, we will use equal to sign “=”.

Example:

number1= number2 = 1

6. How do you change the value of a variable?

We can change the value of the variable by typing the variable name followed by equal to symbol and the new value.

Example:

number1 = 2

number1 = 5

7. How do you reassign a variable by modifying the previous value?

By using Arithmetic operator, we can reassign a variable by modifying the previous value.

Example:

Count= 2

Count+=1 or Count = Count + 1

8. What does the statement `counter += 4` do?

It will be incrementing the counter variable by modifying the previous value by 4 counts.

9. What are the rules for naming a variable?

It should not start with numbers and it should not be any keywords of python.

10. Are variable names case-sensitive? Do `a_variable`, `A_Variable`, and `A_VARIABLE` represent the same variable or different ones?

Variables are case-sensitive and all the above-mentioned variables are different ones.

11. What is Syntax? Why is it important?

Python is sensitive to indentation and loop and function should follow the proper syntax.

12. What happens if you execute a statement with invalid syntax?

Invalid syntax will throw a syntax error or it won't recognise the lines in a function

Example:

Number=1

If (Number=0):

```
print ("number is equal to 0")
```

In the above example even though the number is not equal to 0 that print statement will run because of indentation.

13. How do you check the data type of a variable?

By giving the inbuilt function type

Example:

```
number=10
```

```
print(type(number))
```

14. What are the built-in data types in Python?

- Numbers (integer, float, complex)
- Variables
- Strings
- Dictionary
- List
- Tuple

15. What is a primitive data type?

A primitive datatype is a standalone datatype.

16. What are the primitive data types available in Python?

Numbers

17. What is a data structure or container data type?

It is a container that allows us to store a collection of data.

Example:

Linked list, Tree etc:

18. What are the container types available in Python?

Lists, tuples, sets, dictionaries.

19. What kind of data does the Integer data type represent?

Only numbers without decimal point. (All negative and positive numbers)

20. What are the numerical limits of the integer data type?

No Maximum limit. Until memory space allow.

21. What kind of data does the float data type represent?

Float data type will store the decimal numbers. (All negative and positive numbers)

22. How does Python decide if a given number is a float or an integer?

If a number are having fraction ("/") or decimal (".") symbol then the python decides the given number is float.

23. How can you create a variable which stores a whole number, e.g., 4 but has the float data type?

By type casting the number with float with a whole number.

Example:

A= float (4)

24. How do you create floats representing very large (e.g., 6.023×10^{23}) or very small numbers (0.000000123)?

In python we will represent very large numbers by the number followed by e and for small numbers by the number followed by e and minus sign.

Example:

6.23e23 and 123e-10

25. What does the expression `23e-12` represent?

From most significant bit left shift to 12 digits add by 0's.

Example:

0.000000000023

26. Can floats be used to store numbers with unlimited precision?

Unlimited precision cannot be stored in float. The precision limit will differ with respective to system architecture.

27. What are the differences between integers and floats?

In integers, only whole numbers will be stored and in float will precision the number are getting stored. (decimal numbers)

28. How do you convert an integer to a float?

By type casting the integer we can convert the integer into float.

Example:

A= 10

float (A)

29. How do you convert a float to an integer?

By type casting the integer we can convert the integer into float.

Example:

A= 10.90

int(A)

30. What is the result obtained when you convert 1.99 to an integer?

When we convert 1.99 to integer, we will get 1 as a output.

31. What are the data types of the results of the division operators `/` and `//`?

/ - Float point division.

// - integer division

32. What kind of data does the Boolean data type represent?

True and False

33. Which types of Python operators return booleans as a result?

Data type = <bool>

34. What happens if you try to use a boolean in arithmetic operation?

True – 1

False – 0

35. How can any value in Python be covered to a boolean?

If a value is 0, then it is False

If a value is not 0, then it is True.

36. What are truthy and falsy values?

Truthy means which is true(1)

Falsy means which is not true(0)

37. What are the values in Python that evaluate to False?

Empty string and None and 0

38. Give some examples of values that evaluate to True.

1, "sai", 10

39. What kind of data does the None data type represent?

No Data in that variable

40. What is the purpose of None?

It is used to declare a variable without any value.

41. What kind of data does the String data type represent?

Character values with quotation marks is considered as a String data type

Example:

A=" a"

B=" Sairam"

42. What are the different ways of creating strings in Python?

Single quotations or double quotations or even with triple quotations

43. What is the difference between strings creating using single quotes, i.e. `` and `` vs. those created using double quotes, i.e. "" and ""?

Same

44. How do you create multi-line strings in Python?

By continuation character "\ " or by triple quotations

Example:

**Long= 'I am thilak **

**'Studying in 1st msc **

'sairam'

Output: I am thilak Studying in 1st msc sairam

45. What is the newline character, '\n'?

It creates a new line in the print statement.

It includes more than one line in the string

46. What are escaped characters? How are they useful?

special escape sequences indicated by a "\ " backslash.

47. How do you check the length of a string?

By inbuilt length function

Example:

A="Sairam"

Print(len(A))

48. How do you convert a string into a list of characters?

By typecasting

49. How do you access a specific character from a string?

By its index number

Example:

A= "Sairam"

Print(A[0])

Output: S

50. How do you access a range of characters from a string?

Strings are indexed with the first character having the index 0 Slicing a string produces a substring of a string between the characters at two indices. indexes including the first but excluding the last.

Example:

A= "Sairam"

Print (A[0:2])

Output: Sai

51. How do you check if a specific character occurs in a string?

In quotations will put the character and will type "in" the string name, will gives Boolean value true or false.

Example:

a= "sairam"

"r" in a

Output: True

52. How do you check if a smaller string occurs within a bigger string?

In quotations will put the substring and will type "in" the string name, will gives Boolean value true or false.

Example:

a= "sai ram"

"sai" in a

Output: True

53. How do you join two or more strings?

By concatenation.

Example:

a= "sai"

b= "ram"

a+b

Output: 'sairam'

54. What are \"methods\" in Python? How are they different from functions?

Methods are the operations that belong to a class and can be called using reference.

Functions can be called without any reference.

55. What do the `.lower()`, `.upper()` and `.capitalize()` methods on strings do?

`.lower()` = will change all the character into lower case

`.upper()` = will change all the character into upper case

`.capitalize()` = will change the first character into upper case in a string

Example:

a= "sathya SAI baba"

a.lower() = 'sathya sai baba'

a.upper() = 'SATHYA SAI BABA'

a.capitalize() = 'Sathya sai baba'

56. How do you replace a specific part of a string with something else?

By replace method.

Example:

a= "sai thilak"

a.replace('thilak','sai')

Output: 'sai sai'

57. How do you split the string `"Sun,Mon,Tue,Wed,Thu,Fri,Sat"` into a list of days?
By using split method in python.

Example:

```
days= "Sun,Mon,Tue,Wed,Thu,Fri,Sat"
```

```
days.split()
```

```
['Sun,Mon,Tue,Wed,Thu,Fri,Sat']
```

58. How do you remove whitespace from the beginning and end of a string?
Using strip() function

59. What is the string `.format` method used for? Can you give an example?

Formatting method is used to give the values at the end of the print function.

Example:

```
name="thilak", age=21, cls="MDSC"
```

```
print('my name is {}. my age is {} and studying in {}'.format(name,age,cls))
```

```
output: my name is thilak. my age is 21 and studying in MDSC
```

60. What are the benefits of using the `.format` method instead of string concatenation?
Format is dynamic but not string.

61. How do you convert a value of another type to a string?
By type casting the variable by str keyword.

Example:

```
a= 10
```

```
str(a)
```

```
'10'
```

62. How do you check if two strings have the same value?
By using double equal to symbol `"=="`

Example:

```
a= "sai"
```

```
b= "sai"
```

a == b

output: True

63. Where can you find the list of all the methods supported by strings?

Help(str)

64. What is a list in Python?

A list is an ordered, mutable array of objects. A list is constructed by specifying the objects, separated by commas, between square brackets []

65. How do you create a list?

List can be created by specifying objects, separated by commas, between square brackets []

66. Can a Python list contain values of different data types?

Yes. (types of numbers, built-in constants such as the Boolean value True, and even other lists)

67. Can a list contain another list as an element within it?

Yes.

68. Can you create a list without any values?

Yes. Empty list can be created.

69. How do you check the length of a list in Python?

Example:

a = ["ram", "sai"]

len(a)

2

70. How do you retrieve a value from a list?

By index value of the object in list which starts from 0.

71. What is the smallest and largest index you can use to access elements from a list containing five elements? Smallest = -5

Largest = 4

72. What happens if you try to access an index equal to or larger than the size of a list? list index out of range error will occur.

73. What happens if you try to access a negative index within a list?
If we access negative index, from last element it will fetch.

74. How do you access a range of elements from a list?
By giving the starting point and ending point to the list name.
Example:

```
a
['ram', 'sai']
a[0:1]
['ram']
```

75. How many elements does the list returned by the expression `a_list[2:5]` contain?
2, 3, 4 elements in the list will be returned.

76. What do the ranges `a_list[:2]` and `a_list[2:]` represent?
`a_list[:2]` represents starting from 0th index and ending in 1st index.
`a_list[2:]` represents starting from 2nd index and ending in last index of the list.

77. How do you change the item stored at a specific index within a list?
By using index number.

Example:

```
b = [1, 'two', 3.14, 0]
b[1] = 3
b
[1, 3, 3.14, 0]
```

78. How do you insert a new item at the beginning, middle, or end of a list?
By using extend (for adding at the end) and insert (beginning, middle) methods.

79. How do you remove an item from a list?
By using remove method.

80. How do you remove the item at a given index from a list?
By using remove method by giving values inside it.

Example:

b

[1, 3, 3.14, 0]

b.remove(3.14)

b

[1, 3, 0]

81. How do you check if a list contains a value?
By using the print function.

82. How do you combine two or most lists to create a larger list?
By concatenation, we can add two or more list.

83. How do you create a copy of a list?
By using copy method

84. Does the expression `a_new_list = a_list` create a copy of the list `a_list`?
Yes

85. Where can you find the list of all the methods supported by lists?
Help(list)

86. What is a Tuple in Python?
A tuple is immutable list. It is constructed by placing the items inside the parentheses

87. How is a tuple different from a list?
It is immutable.

88. Can you add or remove elements in a tuple?
No

89. How do you create a tuple with just one element?

By create a tuple with one element with ne comma "a = (1,)"

90. How do you convert a tuple to a list and vice versa?

```
number=(1,2,3,4,5)
type(number)
<class 'tuple'>
list(number)
[1, 2, 3, 4, 5]
type(number)
<class 'tuple'>
```

91. What are the `count` and `index` method of a Tuple used for?

Count counts the number of elements in the tuple.

Index takes returns the index of the first element of the argument.

92. What is a dictionary in Python?

Dictionary is associative array. Each item in dictionary is indexed by a unique key.

93. How do you create a dictionary?

```
car = {'color': 'red', 'cost': 10000}
car
{'color': 'red', 'cost': 10000}
type(car)
<class 'dict'>
```

94. What are keys and values?

Keys – it is an identity to the elements in the dictionary

Value – it is a actual value.

95. How do you access the value associated with a specific key in a dictionary?

```
car
{'color': 'red', 'cost': 10000}
car['color']
'red'
```

96. What happens if you try to access the value for a key that doesn't exist in a dictionary?

KeyError will occur

97. What is the `.get` method of a dictionary used for?

It is used to retrive the vaule, given key if it exists

98. How do you change the value associated with a key in a dictionary?

```
car
{'color': 'red', 'cost': 10000}
car['color']= 'white'
car
{'color': 'white', 'cost': 10000}
```

99. How do you add or remove a key-value pair in a dictionary?

```
car
{'color': 'white', 'cost': 10000}
car.pop('color')
'white'
car
{'cost': 10000}
```

100. How do you access the keys, values, and key-value pairs within a dictionary?"

```
By using inbuild functions like
.keys and .vaules
car
{'color': 'white', 'cost': 10000}
car.keys()
dict_keys(['color', 'cost'])
car.values()
dict_values(['white', 10000])
```