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Mid Sem. - 1 (Session 2022-23)

ITC101 Python Programming

Q.1 What do you understand by software in computer science & how can you categorize the software.

Ans. Software is a set of instructions, data or programs used to operate computers & execute specific tasks. The software is made up of binary language (composed of ones & zeros), & for a programmer writing the binary code would be a slow & difficult task. Therefore, software programmers write the ~~code~~ software program in various human-readable languages such as Python, Java, C++, etc. & later use the source code. Software is the opposite of hardware, which describes the physical aspects of a computer. Software's are classified into two types-

(i) System software
(ii) Application software

⇒ System software is a computer program that helps the user to run computer hardware or software & manages the interaction between them. It is software that constantly runs in the computer background, maintaining the computer hardware & computer's basic functionalities, including the operating system, utility software, & Interface. They also include the basic Input / Output system procedures, the boot program, assembler, computer device driver, etc. System software is also known as "low-level software" because the end-users do not operate them.

⇒ Application software's are end-user computer programs developed primarily to provide specific functionality to the user. The application software assist the user in numerous tasks suchas doing online research, completing notes, designing graphics, managing the finances, watching a movie, writing documents, playing games, & many more.

Word Processors, Database Software, Multimedia Software, Web Browsers are the examples of application software.

& Operation system, Device Drivers, Firmware, Utility are the examples of system software.

Q.2 Write five features of Python that make it user friendly.

Ans. Python is a dynamic, high-level, free open source, & interpreted programming language. It supports object-oriented programming. There are many features in python -

(i) Free & open source → Python language is freely available at the official website. &

(ii) Easy to code → Python is a high-level programming language. Python is very easy to learn as compared to other languages like C, C++, C#, Java, etc. It is also a developer-friendly language.

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(iii) Easy to read → Python's syntax is straight forward. The code block is defined by the indentations rather than by semicolons or brackets.

(iv) Object - Oriented language → Python supports object-oriented language & concepts of classes, object encapsulation, etc.

(v) GUI Programming Support → Graphical User Interfaces can be made using a ~~!~~ module such as PyQt5 ; PyQt4, wxPython, or Tk in python. PyQt5 is the most popular option for ~~gre~~ creating graphical apps with python.

Q.3 List the various numerical data type in python with examples.

Ans. The numeric data type in python represents the data that has a numeric value. A numeric value can be an integer, a floating number, or even a complex number.

(i) Integers - this value is represented by int class. It contains positive or negative whole numbers (without fractions or decimals).

(ii) Float - this value is represented by the float class. It is a real number ~~with floating-point~~ specified by decimal point.

(iii) Complex number - this value is represented by complex class. It is specified as {real part} +

imaginary part. (Ex. 2 + 3j)

NOTE - type ( ) function is used to determine the type of data.

Example -

Input

```
a = 2
print (type (a))

b = 2.0
print (type (b))

c = 2 + 3j
print (type (c))
```

output

```
<class 'int'>

<class 'float'>

<class 'complex'>
```

Q.4 Write the output for the following expression is evaluated using a python interpreter. Write error if you think the expression will raise an error.

(i) print (18 % 6) ⇒ 0

(ii)
```
if 12 + 5 * 9 == 153:
    print ("true")
else:
    print ("false")
```
⇒ ~~error~~ false

(iii) print ("ITC + 101) ⇒ error !

(iv)
```
num~~f~~ = 5 > 4
print (num)
```
⇒ True

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Q.5 (i) Let nums 1 & nums 2 be two non-empty lists. Write a python command that will append the last element of nums 2 to the end of nums 1.

Ans.

```
nums1. append (nums 2 [-1])
```

(ii) List is mutable & tuple is immutable. Justify the statement with excamples.

Ans. List is mutable & tuple is immutable, therfore it is possible to change a list but not a tuple.
The contents of a tuple cannot change once they have been created in python due to the Immutability of tuples.
Lists help to store multiple items & then iterate over them using a loop, because lists are dynamic, we can easily add or remove items anytime.

Examples: ~~of~~ list

Input

```
list = [1, 2, 4, 4, 3]
point (list)

list [2] = 5
point ("mutable", list)
```

output

```
[1, 2, 4, 4, 3]
mutable [1, 2, 5, 4, 3]
```

tuple

```
tuple = (1, 2, 4, 3)
point (tuple)

tuple [2] = 5
point ("mutable", tuple)
```

```
(1, 2, 4, 3)
Error!
```