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Subject - AI ML Assignment 1.5

1)In Python, the concepts of shallow copy and deep copy are used when dealing with objects, including lists, dictionaries, and custom objects. The main difference between shallow copy and deep copy lies in how the original object and its copy are related and whether the copied object contains references to the same or new objects.

Shallow Copy:

A shallow copy creates a new object but references the same objects as the original.

Changes made to the copied object will affect the original object, and vice versa.

Shallow copy is created using the copy() method or the slice operator ([:]).

It is a relatively faster operation as it doesn't create new copies of referenced objects.

Deep Copy:

A deep copy creates a new object and recursively copies all objects referenced within the original.

Changes made to the copied object will not affect the original object, and vice versa.

Deep copy is created using the deepcopy() function from the copy module.

It is a relatively slower operation as it creates new copies of all objects, including referenced objects.

2)# List for storing book information

books = [

{

'title': 'Python Crash Course',

'author': 'Eric Matthes',

'isbn': '978-1593279288',

'available': 5

},

{

'title': 'Clean Code: A Handbook of Agile Software Craftsmanship',

'author': 'Robert C. Martin',

'isbn': '978-0132350884',

'available': 3

},

# Add more books...

]

# List for storing student information

students = [

{

'id': 'S001',

'name': 'Alice',

'books\_borrowed': [

'978-1593279288', # ISBN of 'Python Crash Course'

'978-0132350884' # ISBN of 'Clean Code'

]

},

{

'id': 'S002',

'name': 'Bob',

'books\_borrowed': [

'978-1593279288' # ISBN of 'Python Crash Course'

]

},

]

1. Expressions can be assigned or used as operands, while statements can only be declared. Statements create side effects to be useful, while expressions are values or execute to values. Expressions are unique in meaning, while statements are two-sided in execution.
2. Atomic data types - The data types have values that cannot be divided or broken down further. Atomic data types can be either primitive or derived. Numbers and strings are atomic data types because their values cannot be described using smaller parts.There are four primitive atomic data types: booleans, integers, characters and floats.

Secondary data types - It is a data type that derived from an existing data type. You can use secondary data types to extend the built-in types already available and create your own customized data types.

1. A user-defined data type (UDT) is a data type that derived from an existing data type. You can use UDTs to extend the built-in types already available and create your own customized data types.