## 1.Define Artificial intelligence (AI) and provide examples of its applications.

Artificial intelligence (AI) refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.

. At the simplest level, machine learning uses algorithms trained on data sets to create that allow computer systems to perform tasks like making song recommendations, identifying the fastest way to travel to a destination, or translating text from one language to another. Some of the most common examples of AI in use today include:

**ChatGPT:** Uses large language models (LLMs) to generate text in response to questions or comments posed to it.

**Google Translate:** Uses deep learning algorithms to translate text from one language to another.

**Netflix:** Uses machine learning algorithms to create personalized recommendation engines for users based on their previous viewing history.

**Tesla:** Uses computer vision to power self-driving features on their cars.

Examples:

. Manufacturing robots

. Self-driving cars

. HealthCare management

. Virtual travel booking agent

. Social media monitoring

These are the examples of AI

Artificial Intelligence and of its applications

They are:

1. Application of Artificial Intelligence in Education

Artificial Intelligence helps create a rich learning experience by generating and providing audio and video summaries and integral lesson plans.

1. Application of Artificial Intelligence in Lifestyle

Artificial Intelligence has a lot of influence on our lifestyle. Let us discuss a few of them.

Autonomous Vehicles

Spam Filters

Facial Recognition

1. Application of Artificial Intelligence in Robotics

It can be used for:

. Carrying goods in hospitals, factories, and warehouses

. Cleaning offices and large equipment

. Inventory management.

## 2. Differentiate between supervised and unsupervised learning techniques in ML.

|  |  |
| --- | --- |
| Supervised learning | Unsupervised learning |
| It involves building a model to estimate or predict an output based on one or more inputs. | It involves finding structures and relationships from inputs.There is no “supervising” output. |
| Explanatory and response variables | Explanatory variable only |
| Types of algorithm   1. Regression 2. Classification | Types of algorithm  1.Clustering  2.Assosciation |
| Learning takes place offline | Learning takes place online |
| Used for prediction | Used for analysis |
| Input data is labeled | Input data is unlabeled |
| Less complex | More complex |

# 3.What is python? Discuss its main features and advantages.

Python is an interpreted language, a high-level language and dynamic language. It is easy and simple to learn.

. Interpreted language: Programming language where the source code is translated into machine code and executed line by line.

Example: python, Ruby, JavaScript

. Compiled language: Programming language where the entire source code is translated into machine code first in the compilation step and then executed is called a compilation language.

Example: C language

Features:

. Easy To Learn and Readable Language.

. interpreted language.

. Dynamic language.

. Open Source and Free.

. High-level language.

. Object Oriented Programming Language.

Python Advantages:

.  Easy to learn

. Availability of support

. Large global community

.  Free learning resources

. Free and open-source

. Productivity and workflow speed

# 4.What are the advantage s of using python as a programming language for AI and ML?

Some advantages of using Python for Machine Learning and AI-based projects include:

. Less Code

. Access to great libraries and frameworks for AI and machine learning (ML)

. Simplicity and consistency

. Platform independence

. Flexibility

AI is on the onset of creating a technologically advanced world, with Netflix and Spottily already leveraging the technology to recommend TV shows/movies and artists/songs to their users. AI is also making its way in industrial processes to enhance process workflows and employee productivity.

#### Advantages of Using Python for AI

Python is an outstanding language majorly because it doesn’t need compiling into machine language instruction to be executed. A developer can directly run a program written in Python.

But other than this, there are a lot more benefits of choosing to develop AI projects using Python.

**1. A huge library ecosystem**

Python offers a vast choice of libraries for AI development, which contain base-level items that save coding time. These libraries also make it easy to access, handle, and transform data.

**2. The flexibility of the language**

Python for AI is an extraordinary language, as it is truly flexible:

. It offers a choice to pick from using Object Oriented Programming (OOPS) or scripting.

. There’s no compelling reason to recompile the source code; developers can actualize any changes and observe the outcomes.

. Software developers can join Python and other languages to achieve their goals.

1. **Huge Number of Libraries and Frameworks**:
   * Python boasts an extensive ecosystem of libraries and frameworks specifically designed for AI and ML development.
   * Libraries like **Sickest-learn**, **spaCy**, and **Natural Language Toolkit (NLTK)** provide pre-built implementations of various ML algorithms.
   * Popular deep learning frameworks such as **TensorFlow**, **PyTorch**, and **Keras** are also widely used in the AI community.
2. **Easy Syntax and Resembles English Language**:
   * Python’s syntax is straightforward and resembles everyday English, making it easy for developers to learn and understand.
   * Unlike languages that rely heavily on brackets, Python uses indentation, which reduces code complexity.
3. **No Need to Recompile Source Code**:
   * Python allows developers to make changes quickly without the need for recompilation.

This flexibility accelerates development and experimentation.

Python’s approach to using it instead of explicit separators **reduces visual clutter and helps prevent common errors caused by misplaced or mismatched delimiters. Python ensures that developers follow a standard and consistent style while using indentation which makes it easier to understand and modify code written by others and reduces ambiguity**.

## 5. Discuss the importance of indentation in python code.

Python’s approach to using it instead of explicit separators **reduces visual clutter and helps prevent common errors caused by misplaced or mismatched delimiters. Python ensures that developers follow a standard and consistent style while using indentation which makes it easier to understand and modify code written by others and reduces ambiguity**.

num = int(input("enter number"))

if num%2 == 0:

   if num%3 == 0:

      print ("Divisible by 3 and 2")

   else:

      print ("divisible by 2 not divisible by 3")

else:

   if num%3 == 0:

      print ("divisible by 3 not divisible by 2")

   else:

      print  ("not Divisible by 2 not divisible by 3")

# 6.Define a variable in python. Provide examples of valid variable names.

Variables: It is used to stores the data values

. We should not use keywords.

. We should not use special characters.

Ex; City-name = ’Warangal’

**Variable** **Assigning**: It is used to store multiple data.

X = 5

Y = ‘Hello’

Z = 3.14

Print (z)

Output : 3.14

**Multi** **Variable Assigning**: Multiple variables are int var, float var, string var = 3,4,5

Print ( float var)

4. 5

**Operators:**

1. Arithmetic Operator:

5+6=11

1. Comparison Operator:

10>5

True

1. Logical Operator:

AND, NOR, NOT

**Data Types:**

Which represents the data types storing in the

1. **Numeric data types:**

Var 1 = 18

Var 2 = 10.5

Var 3 = 10+2j

Print (type (var 1))

Print (type (var2))

Print (type (var3))

Run:

(Class ‘int’)

(Class ‘float’)

(Class ‘complex’)

1. **String:**

Group of characters and are stored in with in double cots (“ “).

Str(“Hello World”)

Run:

Hello World

# 7. Explain the difference between a keyword and an identifier in python.

|  |  |
| --- | --- |
| Keyword | Identifier |
| Keywords are reserved words with special meaning. | Identifier is a unique name given to the class, function, array & so on. |
| Keywords do not have symbols. | Identifier can have symbols. |
| Specify the type/kind of entity | Identify the name of a particular entity |
| Keywords are not further classified | Identifiers are classified into ‘external name’  And’ internal name’ |
| Example:  Class, While | Example:  Var, a, \_newstr, new var, and so on |

# 8. List the basic data types available in python.

Th[e basic data types available in Python are](https://www.bing.com/ck/a?!&&p=c534ec4e29686a85JmltdHM9MTcxNDM0ODgwMCZpZ3VpZD0yNmEyZGVjNS01OGZlLTY1OTItM2VlMy1jZDJlNTk1MzY0MmMmaW5zaWQ9NTg3NQ&ptn=3&ver=2&hsh=3&fclid=26a2dec5-58fe-6592-3ee3-cd2e5953642c&psq=List+the+basic+data+types+available+in+python.&u=a1aHR0cHM6Ly93d3cuYW5hbHl0aWNzdmlkaHlhLmNvbS9ibG9nLzIwMjEvMDgvZGF0YS10eXBlcy1pbi1weXRob24teW91LW5lZWQtdG8ta25vdy1hdC10aGUtYmVnaW5uaW5nLW9mLXlvdXItZGF0YS1zY2llbmNlLWpvdXJuZXkv&ntb=1)

. Numeric: int, float, complex

. String: Str

. Sequence types: list, tuple, range

. Binary types: bytes, byte array, memoryview

. Mapping data type: dict

Each data type has its own set of properties, methods, and behaviours that allow programmers to manipulate and process data effectively in their programs.

# 9.Describe the syntax for an if statement in python.

An if statement executes a block of code only if the specified condition is met. Syntax Here, if the condition of the if statement is:

1.**True - the body of the if statement executes.**

2.**False - the body of the if statement is skipped from execution.**

If statement:

a = 33  
b = 200  
if b > a:  
  print("b is greater than a")

### Syntax of If Statement:

Following is the syntax of if-statement in Python.

if Boolean expression:

statement(s)

## 10. Explain the purpose of the elif statement in python.

The **purpose of the `elif` statement in Python** is to:

1. [Handle multiple conditions sequentially](https://www.bing.com/ck/a?!&&p=018734e0f1191586JmltdHM9MTcxNDM0ODgwMCZpZ3VpZD0yNmEyZGVjNS01OGZlLTY1OTItM2VlMy1jZDJlNTk1MzY0MmMmaW5zaWQ9NTg4OA&ptn=3&ver=2&hsh=3&fclid=26a2dec5-58fe-6592-3ee3-cd2e5953642c&psq=Explain+the+purpose+of+the+elif+statement+in+python.&u=a1aHR0cHM6Ly9pb2Zsb29kLmNvbS9ibG9nL2VsaWYtcHl0aG9uLw&ntb=1).
2. [Execute a specific block of code as soon as a true condition is found](https://www.bing.com/ck/a?!&&p=eb43b44b2d17dfdeJmltdHM9MTcxNDM0ODgwMCZpZ3VpZD0yNmEyZGVjNS01OGZlLTY1OTItM2VlMy1jZDJlNTk1MzY0MmMmaW5zaWQ9NTg5Mg&ptn=3&ver=2&hsh=3&fclid=26a2dec5-58fe-6592-3ee3-cd2e5953642c&psq=Explain+the+purpose+of+the+elif+statement+in+python.&u=a1aHR0cHM6Ly9pb2Zsb29kLmNvbS9ibG9nL2VsaWYtcHl0aG9uLw&ntb=1).
3. Serve as a shortened version of ‘’elif”.

Use the elif condition is used to include multiple conditional expressions after the if condition or between the if and else conditions.

Syntax:

if [boolean expression]:

[statements]

elif [boolean expression]:

[statements]

elif [boolean expression]:

[statements]

else:

[statements]

The elif block is executed if the specified condition evaluates to True.