Programme Educational Objectives(PEOs)

PEO1 (Core Competency) : Graduates will acquire a strong foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze Computer Science and Engineering problems.

PEO2 (Professionalism) : Graduates will practice the profession with ethics, integrity and leadership to relate engineering to global perspective issues and social context.

PEO3 (Higher Studies and Entrepreneurship) : Graduates will be prepared for their careers in the software industry or in higher studies leading to research and for applying the spirit of innovation and entrepreneurship in their career and continuing to develop their professional knowledge on a life long basis.

Programme Outcomes(POs)

PO1: Engineering knowledge: Ability to apply the knowledge of mathematics, physical sciences and computer science and engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Ability to identify, formulate and analyze complex real life problems in order to provide meaningful solutions by applying knowledge acquired in computer science and engineering.

PO3: Design/development of solutions: Ability to design cost effective software / hardware solutions to meet desired needs of customers/clients.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in the field of computer science and engineering.

PO5: Modern tool usage: Create, select and apply appropriate techniques, resources and modern computer science and engineering tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSOs)

PSO1: Software System Design and Development: The ability to apply software development life cycle principles to design and develop the application software that meet the automation needs of society and industry.

PSO2: Computing and Research ability: The ability to employ modern computer languages, environments and platforms in creating innovative career paths in SMAC (Social, Mobile, Analytics and Cloud) technologies.

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY
K.S.R KALVI NAGAR, TIRUCHENGODE – 637 215
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Python Programming

K S R Institute for Engineering and Technology

Vision
To become a globalLy recognized Institution in Engineering Education, Research and Entrepreneurship.

Mission
IM1: Accomplish quality education through improved teaching learning process.
IM2: Enrich technical skills with state of the art laboratories and facilities.
IM3: Enhance research and entrepreneurship activities to meet the industrial and societal needs

Department of Computer Science and Engineering

Vision
To produce globally competitive Computer Science Engineers and Entrepreneurs with moral values.

Mission
DM1 (Quality Education) : Provide quality education to enhance problem solving skills, leadership qualities, team spirit and ethical responsibilities.
DM2 (State of art Laboratory) : Enable the students to adapt to the rapidly changing technologies by providing advanced laboratories and facilities.
DM3 (Research and Development) : Promote research based activities in the emerging areas of techno-environment in order to meet industrial and societal needs.

Python - Introduction

Python is a widely-used, interpreted, object-oriented, and high-level programming language with dynamic semantics, used for general-purpose programming. It was created by Guido van Rossum, and first released on February 20, 1991. The goals are,

An easy and intuitive language just as powerful as those of the major competitors;

Open source, so anyone can contribute to its development;

Code that is as understandable as plain English;

Suitable for everyday tasks, allowing for short development times.

Python reached version 1.0 in January 1994. The major new features included in this release were the functional programming tools lambda, map, filter and reduce Python 2.0 was released on 16 October 2000 with many major new features, including a cycle-detecting garbage collector and support for Unicode.

Python 3.0 was released on 3 December 2008. It was a major revision of the language that is not completely backward-compatible.

Many of its major features were backported to Python 2.6.x and 2.7.x version series. Releases of Python 3 include the 2 to 3 utility, which automates (at least partially) the translation of Python 2 code to Python3.

Python uses dynamic typing, and a combination of reference counting and a cycle-detecting garbage collector for memory management. It also features dynamic name resolution (late binding), which binds method and variable names during program

Python's design offers some support for functional programming in the Lisp tradition. It has filter(), map(), and reduce() functions; list comprehensions, dictionaries, and sets; and generator expressions.

What is Python?

Python is an interpreted, high-level, general-purpose programming language. It is used for:

- Web development (server-side),
- Software development,
- Mathematics
- System scripting.

Why Python?

- Python can be used on a server to create web applications.
- Python can be used alongside software to create workflows.
- Python can connect to database systems. It can also read and modify files.
- Python can be used to handle big data and perform complex mathematical functions with respect to the application being developed.
- Python can be used for rapid prototyping, or for production-ready software development.

Good to know

- The most recent major version of Python is Python 3, which we shall be using in industries. However, Python 2, although not being updated with anything other than security updates, is still quite popular.
- Python will be written in a text editor. It is possible to write Python in an Integrated Development Environment, such as Thonny, Pycharm, Netbeans or Eclipse which are particularly useful when managing larger collections of Python files.
- There an online platform for the interactive learning of python using scratch.

Python Syntax compared to other

- Python was designed to for readability, and has some similarities to the English language with influence from mathematics.
- Python uses new lines to complete a command, as opposed to other programming languages which often use semicolons or parentheses.
- Python relies on indentation, using whitespace, to define scope; such as the scope of loops, functions and classes. Other programming languages often use curly-brackets for this purpose.

Guido van Rossum

K.Dharani, III-CSE

Student Corner

QUIZ TIME
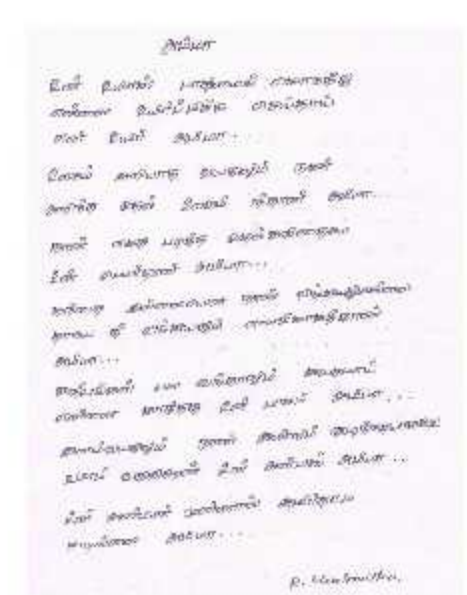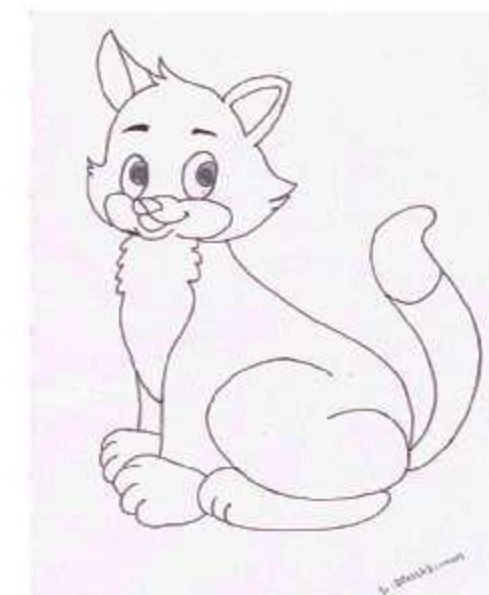
1. Which of the following statements is true?

(a) Python is a high level programming language.
(b) Python is an interpreted language.
(c) Python is an object-oriented language.
(d) All of the above.

2. What is used to define a block of code (body of loop, function etc.) in Python?

(a) Curly braces
(b) Parenthesis
(c) Indentation
(d) Quotation

3. hich of the following is correct?

(a) Comments are for programmers for better understanding of the program.
(b) Python Interpreter ignores comment.
(c) You can write multi-line comments in Python using triple quotes, either ''' or """.
(d) All of the above

4. Which of the following is correct?

(a) Variable name can start with an underscore.
(b) Variable name can start with a digit.
(c) Keywords cannot be used as a variable name.
(d) Variable name can have symbols like: @, #, $ etc.

S.Naveen Kumar III-CSE

Python Features

Python Features
Python provides lots of features that are listed below.

KEY Features

1) Easy to Learn and Use
Python is easy to learn and use. It is developer-friendly and high level programming langu

2) Expressive Language
Python language is more expressive means that it is more understandable and readable.

3) Interpreted Language
Python is an interpreted language i.e. interpreter executes the code line by line at a time. This makes debugging easy and thus suitable for beginners.

4) Cross-platform Language
Python can run equally on different platforms such as Windows, Linux, Unix and Macintosh etc. So, we can say that Python is a portable language.

5) Free and Open Source
Python language is freely available at offical web address.The source-code is also available. Therefore it is open source.

6) Object-Oriented Language
Python supports object oriented language and concepts of classes and objects come into existence.

7) Extensible
It implies that other languages such as C/C++ can be used to compile the code and thus it can be used further in our python code.

8) Large Standard Library
Python has a large and broad library and prvides rich set of module and functions for rapid application development.

9) GUI Programming Support
Graphical user interfaces can be developed using Python.

10) Integrated
It can be easily integrated with languages like C, C++, JAVA etc.

R.Sudharsan, II / CSE

Install Python on windows

Step 1: Download the Python 3 Installer
   1. Open a browser window and navigate to the Download page for Windows at python.org.
   2.Underneath the heading at the top that says Python Releases for Windows, click on the link for the Latest Python 3 Release -Python 3.x.x.
   3.Scroll to the bottom and select either Windows x86-64 executable installer for 64-bit or Windows x86 executable installer for 32-bit.

Step 2: Run the Installer
   Once you have chosen and downloaded an installer, simply run it by double-clicking on the downloaded file, a dialog should appear

Then just click Install Now. That should be all there is to it. A few minutes later you should have a working Python 3 installation on your system.

R.Prasanth, II / CSE

Python in Web Development

Web development is the umbrella term for conceptualizing, creating, deploying and operating web applications and application programming interfaces for the Web.

How does Python fit into web development?

Python can be used to build server-side web applications. While a web framework is not required to build web apps, it's rare that developers would not use existing open source libraries to speed up their progress in getting their application working.

Python is not used in a web browser. The language executed in browsers such as Chrome, Firefox and Internet Explorer is JavaScript. Projects such as pyjs can compile from Python to JavaScript. However, most Python developers write their web applications using a combination of Python and JavaScript.

Python is executed on the server side while JavaScript is downloaded to the client and run by the web browser.

Web development is the umbrella term for conceptualizing, creating, deploying and operating web applications and application programming interfaces for the Web.

Python Ide For Web Development

The simple fact that Python lets you build a lot more with a fewer lines of code makes it stand out. This helps in building prototypes efficiently and during debugging these codes.
The Django framework provided by Python is a boon for all developers as it can be used to create dynamic and highly secure web apps. By learning Python, you can also perform web scraping,

Few popular websites that are developed using python,

- YouTube.
- DropBox.
- Survey Monkey
- Google
- Quora
- Bitly.
- Reddit
- Yahoo Maps.
- Instagram

Python Web Frameworks

A web framework consists of a set of libraries and a main handler within which you can build custom code to implement a web application (i.e. an interactive web site). Most web frameworks include patterns and utilities to accomplish at least the following:

URL : Routing Matches an incoming HTTP request to a particular piece of Python code to be invoked
Request and Response Objects: Encapsulates the information received from or sent to a user's browser
Template Engine: Allows for separating Python code implementing an application's logic from the HTML (or other) output that it produces
Development Web Server: Runs an HTTP server on development machines to enable rapid development; often automatically reloads server-side code when files are updated

List of Frameworks

Django	Flask
Falcon	Tornado
Pyramid	Masonite
FastAPI	

R.M.Chinnadamani, N.Priyanka, III / CSE

Tech Update

Popularity of Programming Language

Python is really gaining all the buzz these days. This language is widely accepted by data scientists and data analysts, it has also become a very useful language for software engineers, software developers, development leads, managers, engineers, system analysts and web developers under the umbrella of IT outsourcing companies.

As per the PYPL Popularity of Programming Language report, Python has 16.4% market share and considered to be the second popular language as searched for tutorials on Google. Also it's one of the leading languages that sets a programming trend in Artificial Intelligence.

Language Rank	Types	Spectrum Ranking
1. Python		100.0
2. C		99.7
3. Java		99.5
4. C++		97.1
5. C#		87.7
6. R		87.7
7. JavaScript		85.8
8. PHP		81.2
9. Go		75.1
10. Swift		73.7

Scratch

There are libraries that make it easier to write Python code that communicates with Scratch.

Versions:

Scratch 2.0

blockext — for writing extensions that are compatible with both Scratch 2.0 and Snap!. Generates extension files automatically. Clean programming interface. Needs documentation.
pyscratch2 — allows retrieval of the Scratch API from the project in Python code.
ScratchAPI — Opensource python library providing an interface for the Scratch APIs.

Scratch 1.4

Scratch — Provides a clean interface for responding to broadcasts and sensor updates using decorators (based on scratch.py)
scratch.py (forum page) by pquiza — provides code for communicating with Scratch

Scratch Website

The Scratch Website is the official website for Scratch, in which users can upload and view projects, as well as communicate with others through comments on profiles, studios, projects, and posts on the Scratch Forums. The URL of the Scratch website is https://scratch.mit.edu

The Scratch Website is extremely customizable; other users can be followed, studios can be created, projects and studios can be deleted. Other user's profiles can be viewed as well.

What are the technologies a Python developer must know?

Object-Oriented Programming(OOP) concepts
Static vs compiled language
Interpreter vs compiler
Pass by reference or pass by value(which one python uses, both, none?)
Infamous Global Interpreter Lock(GIL).
Inbuilt data structures - list, map, tuple, set.
List and dict comprehension.
Core libraries - os, sys, argparse, SQLite(really useful).

M.Kannan,Aravind.L, IV / CSE

Applications

in Artificial Intelligence (AI)

Python is fast, scalable, robust and platform agnostic. These advantages make Python a perfect fit for AI. Using Python, you can replicate every idea with a few lines of code which is not possible with other languages. It provides libraries such as 'Keras' and 'TensorFlow' that bring out machine learning functionalities. Also, the libraries provided by Python like – 'Scikit learn' is highly used in AI algorithms. Scikit is a free machine learning library featuring various regression, classification and clustering algorithms. All these reasons combined makes learning Python an easy choice over other languages for AI applications.

M.Poornima, III / CSE

Online Ads Network

One of the biggest users of artificial intelligence is the online ad industry which uses AI to not only track user statistics but also serve us ads based on those statistics. Without AI, the online ad industry will just fail as it would show random ads to users with no connection to their preferences what so ever. AI has become so successful in determining our interests and serving us ads that the global digital ad industry has crossed 250 billion US dollars with the industry projected to cross the 300 billion mark in 2019. So next time when you are going online and seeing ads or product recommendation, know that AI is impacting your life.

R.Kokila, IV / CSE

Smart Home Devices

We are even willingly letting artificial intelligence in our houses. Many of the smart home devices that we buy use artificial intelligence to learn our behavior so that they can adjust the settings themselves to make the experience as frictionless as possible for us. Let us consider about smart voice assistants which we use to control these smart home devices, and as we know, they are the prime example of AI impacting our lives.

G.Nagalakshmi, III / CSE

Python in Big Data

Python is extensively used for analyzing huge chunk of data and extracting useful insights to drive businesses. Apart from its simplicity which is a great boon, Python also has an exhaustive set of Data Processing libraries. This makes Python a no-brainer for any organization looking to work with data. Libraries like 'Pydoop' is of great help to professionals as you can write a MapReduce code in Python and process the data in the HDFS – Hadoop File System cluster.

Other libraries such as 'Dask' and 'Pyspark' make Data Analysis and management even easier. Python is fast and highly scalable. These features help Python in generating insights in real-time environments and making it one of the preferred languages for Big Data.

M.Geethanjali, III / CSE