**SAVEETHA SCHOOL OF ENGINEERING**

**SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL**

**SCIENCES**

**COMPUTER SCIENCE AND ENGINEERING PROGRAM**

**CSA0830-Python programming for Business applications-**

**Reg no:192210324**

**Name: Pinna Surya narayana**

**COURSE LEARNING OUTCOME**

On successful completion of the course, the student will be able to:

1. Find solutions to simple computational problems

2. Decompose a Python program into functions and develop programs with conditional, loop constructs and strings

3. Represent compound data using Python lists, tuples, and dictionaries.

4. Read and write data from/to files in Python Programs and create modules and packages.

5. Access CSV file and plot different graphs by connecting the database

**Course learning outcome (CLOs) Vs Assignment mapping**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Assignment** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **1** | **yes** | **yes** | **yes** | **no** | **no** |

**APPLICATION ASSIGNMENT -MINI PROJECT**

**ASSIGNMENT TITLE (MINI PROJECT):**

**DETERMINING THE CHRONOLOGICAL AGE OF FOSSILS**

**ASSIGNMENT DESCRIPTION:**

Fossil dating is crucial for unraveling the mysteries of Earth's past, aiding in the understanding of evolution, paleoclimate, and geological processes. This abstract provides a comprehensive overview of fossil dating methods with a focus on their applications and integration with Python programming. Firstly, relative dating techniques such as stratigraphy and biostratigraphy establish the relative ages of fossils based on their position within rock layers and the presence of index fossils. Radiometric dating methods, including radiocarbon dating and potassium-argon dating, offer absolute age estimates by measuring the decay of radioactive isotopes in minerals. These techniques are often implemented in Python through libraries such as NumPy and SciPy, facilitating data analysis and age calculation. Luminescence dating, paleomagnetic dating, and stratigraphic correlation further refine age estimates by examining the luminescence properties of minerals, the record of Earth's magnetic field reversals, and the correlation of fossil-bearing deposits, respectively. Python scripts can aid in processing and analyzing data obtained from these methods, enhancing precision and efficiency.

Moreover, tephrochronology, which utilizes volcanic ash layers, and dendrochronology, based on tree-ring sequences, contribute valuable chronological information. Python's versatility allows for the development of algorithms to correlate tephra layers or analyze dendrochronological data, providing additional insights into fossil ages. The integration of Python with these dating methods not only streamlines data analysis but also fosters innovation and collaboration within the paleontological community. By combining sophisticated dating techniques with powerful computational tools, researchers can unlock the secrets of Earth's ancient past with unprecedented accuracy and depth.

**ASSIGNMENT WORK DISTRIBUTION:**

**Preliminary stages (Assignment 1):**

1. Identifies key fossils for dating and provides stratigraphic context.
2. Collaborates with programmers to integrate Python scripts for data analysis. Collects rock samples for radiometric dating and analyses sedimentary layers.
3. Works with programmers to develop Python algorithms for stratigraphic correlation and paleomagnetic analysis.
4. Develops Python scripts for radiometric age calculations and data visualization.
5. Implements algorithms for stratigraphic correlation and paleomagnetic analysis using Python.
6. Collaborates with data analysts to integrate Python code for seamless data processing.
7. Documents the research methodology, Python implementations, and findings.
8. Prepares reports, presentations, and manuscripts incorporating Python-generated visualizations and analyses