

**MASTER OF COMPUTER APPLICATIONS**  
**[2024 ONWARDS]**

**THIRD SEMESTER - ASSIGNMENT TOPICS**

**P24CDMCA7 - COMPILER DESIGN**

**Assignment topic 1 (any two from the following)**

1. Explain the role of a lexical analyzer in a compiler. Describe how it processes the input and converts it into tokens. Include the concept of regular expressions and automata with an example.
2. Write a simple context-free grammar (CFG) for an arithmetic expression involving addition and multiplication.
3. Differentiate between synthesized and inherited attributes in syntax-directed translation.

**Assignment topic 2 (any two from the following)**

1. What is Intermediate Code in a compiler? Explain why we use intermediate code instead of directly generating machine code. Give a simple example to show how it looks in intermediate code.
2. List and explain any three common optimizations done by compilers. Use simple examples to show how optimizations work.
3. What is the purpose of using a “symbol table” during code generation? Explain what information is stored in it and how it helps in generating correct code.

**P24CDMCA8 – MACHINE LEARNING TECHNIQUES**

**Assignment topic 1 (any two from the following)**

1. What is Machine Learning? Explain the basic idea of machine learning and how it is used in real life. Give two simple examples
2. Differentiate between supervised and unsupervised learning. Give at least one example and a simple diagram for each type.
3. What is classification in machine learning? Write a short note on how classification works using a decision tree or Naïve Bayes, with a simple example

**Assignment topic 2 (any two from the following)**

1. What is a Bayesian Network? Explain with a small diagram how it shows relationships between variables using probabilities
2. What is Reinforcement Learning? Explain the basic idea with a simple example
3. What is the Monte Carlo method? Explain in simple words how random sampling is used to make predictions.

## P24CDMCA9 – BIG DATA ANALYTICS

### **Assignment topic 1 (any two from the following)**

1. Explain the key differences between traditional Business Intelligence (BI) and modern Data Science. Describe how their goals, approaches, and tools vary.
2. Describe the main stages in the data analytics lifecycle. Briefly explain each stage and how they help in turning data into useful insights.
3. What is clustering? Explain the basic idea of clustering and how it helps to group similar data points. Use a simple example to illustrate.
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### **Assignment topic 2 (any two from the following)**

1. What is the purpose of classification in data analytics? Explain how classification helps in decision-making processes with an easy-to-understand scenario.
2. Write a short note on time series analysis. Mention what kind of data is used, and how patterns over time can be identified.
3. What is Hadoop, and why is it important for big data analytics? Give a simple explanation of its purpose and how it handles large data.

## P24CDMCAE3 – Elective-III NATURAL LANGUAGE PROCESSING

### **Assignment topic 1 (any two from the following)**

1. What are the different stages of Natural Language Processing? Write a short note on each stage with simple examples.
2. Explain what is meant by 'Word Segmentation' and 'Sentence Segmentation'. Why are they important in NLP?
3. What is an N-gram model? Explain how it is used in language modelling with an example.

### **Assignment topic 2 (any two from the following)**

1. What is Word Sense Disambiguation? Why is it important in Natural Language Processing?
2. Write a short note on WordNet and its use in Lexical Semantics. How does it help understand word meanings?
3. What is Sentiment Analysis? Explain with an example how NLP can be used to find opinions or emotions in text.

## P24CDMCABC5 – PYTHON PROGRAMMING

### **Assignment topic 1 (any two from the following)**

1. What are the main features of Python? Explain why Python is considered a popular programming language today.
2. What is the difference between lists, tuples, and dictionaries in Python? Write a comparison based on how they store data and how they are used.
3. Explain the use of conditional and loop statements in Python. Briefly describe any three such statements with their purpose.

### **Assignment topic 2 (any two from the following)**

1. What are file objects in Python? Describe how Python handles reading and writing files.
2. Write a short note on command-line arguments in Python. Why are they used and how are they accessed?
3. Explain with example, the concept of recursion in Python functions

## P24CDMCABC6 – INTERNET PROGRAMMING

### **Assignment topic 1 (any two from the following)**

1. Write a short note on the architecture of the .NET Framework. Mention any two main parts and their role.
2. Explain the basic structure of an HTML document. Mention any four important tags used and their purpose.
3. Describe the life cycle of a servlet. Explain the main phases involved in how a servlet is loaded and executed.

### **Assignment topic 2 (any two from the following)**

1. What are the ways in which an applet can communicate with a servlet? List the options and explain any one briefly.
2. What is servlet collaboration? Explain how servlets can reuse or interact with each other.
3. What is the role of Java Server Pages (JSP) in web programming? Briefly describe how JSP helps in server-side solutions.

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