Paradigms Of Programming Assignment 2

Submitted To:

Sushmita G.Kamble

Prakash Raghavendra

Submitted By:

Aniketh Anagawadi (17IT208)

Arpita Raghunandan(17IT211)

Madhuparna Bhowmik(17IT221)

Saurabh Agarwala(17IT2237)

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Abstract

The report seeks to explore different programming domains by working on the linear search algorithm in different programming languages. It addresses the different characteristics of programming languages in different domains. A programming paradigm is a pattern of problem solving thought that underlies a particular genre of programs and languages. All computer languages are classified into four main programming domains:

1. Imperative(Procedural)
2. Object Oriented
3. Functional
4. Logical

This project has explored a language in each of these categories and the findings are as follows:

1. Imperative languages follow the Von Neumann Eckert model and consider program and data indistinguishable in memory. They involve sequences of steps that change the state of the computer. The program is considered to consist of a sequence of commands which may involve assignments, loops, conditionals and functional calls. Ex: C
2. Object Oriented languages consider a program as a collection of objects that can inter-communicate using messages, using which the state of the objects can be transformed. Ex: JAVA
3. Functional languages are built over and around logical functions or procedures within its programming structure. They are based on and are similar to mathematical functions in its program flow. Functional languages derive their basic structure from the mathematical framework of Lambda calculus and combinatory logic. Ex: LISP
4. Logic programming languages state a program as a set of logical relations . A program is executed by an “inference engine” that answers a query by searching these relations systematically to make [inferences](https://www.merriam-webster.com/dictionary/inferences) that will answer a query. Ex: SQL
5. Event driven programming involves program whose execution is determined by user, sensor outputs or messages from other programs or threads. There is generally a main loop that listens for events and then triggers a callback function when one of the intended events is detected. Ex: JavaScript

These findings help us to apply these languages to various programming domains such as :

1. Imperative Languages such as C are generally used for Systems Programming and Embedded Systems
2. Functional Languages are generally used for scientific applications and in Machine Learning and Artificial Intelligence.
3. Event driven Languages are used for creating web software.
4. Object Oriented programming languages are used for Graphical User Interface based application (like Adobe and Photoshop), computer graphics and to gaming applications.
5. Logical Programming languages such as SQL are used in businesses and scientific applications.

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Introduction

Background

The study of various programming languages is necessary to improve background for choosing appropriate languages for future applications, increased ability to express ideas and enhance one’s ability to learn new languages. Many modern languages are employed in more than one programming domains and employ one or more programming paradigms. To fully understand them and create new languages, the detailed study of different programming languages is required.

Purpose

The aim of this project is to provide an introduction to various programming languages and their basics. The study aims to explore how different languages can be used to implement the same algorithm (linear search).