**Synopsis:**

Project Title: Snake Video Game development in Python using Pygame Library and MySql.

Learning Outcomes :

1) Animation in 2D graphics and other gaming techniques, video and audio mixing, Drawing

Characters and preparing their animated sequences

2) Object Oriented Programming in Python

3) Database Management in Python ( Required in saving and retrieving the top 10 scores achieved by the players)

Project Description :

This is a project on developing the Snake Game, a popular graphical computer game in Python programming language using the Pygame library. Snake the main character of this game can be moved in any direction within a rectangular area using Arrow Keys and also 'AWSD' keyboard keys. Some food items and obstacles are placed in its path in random positions. The snake has to avoid touching the obstacles and can eat the food items. If it eats good food (food it likes/relishes) its tail increases and the score is incremented. On the other hand if it eats a bad food (food it dislikes or does not relish) its tail gets reduced and the score remain the same. Some food items increase or reduce the pace of the game. If the snake bangs on any obstacle the score gets decremented. The size of the snake may also get reduced depending on the kind of stone it hits. The game will be abruptly over in the first level itself if the snake touches the walls of the rectangular area or its own body. In all the levels of the game the general rule is that the snake should not try to move in the reverse direction and should not touch/bite its own body.

The game will have 4 levels with increasing difficulty/complexity. Chances are provided for jumping from 2nd level to 4th level. There is also a possibility that the player jumps to 4th level, or falls to 1st level from 2nd level or loose abruptly in the middle of the game in any level. This chance is provided conditionally, based on the score and/or the snake length. The goal of the game is to reach the 4th level by scoring required minimum average score at each level and by maintaining minimum required snake length at the end of each level time period and win from there.

In the middle of the 1st level a box containing 6 x 6 squares in which different shapes in various colors including RGB and Orange will be shown. RGB and Orange colored shapes will have 4 level numbers written on them. The level numbers are associated with the these colors randomly and will be different every time the game is played. The player has to remember the level numbers associated with the colors. In the middle of the 2nd level game a chance will be provided to the player to proceed directly to 4th level by directing the snake to enter into an appropriate colored pipe displayed conditionally. In case the snake enters a wrong pipe, it instead of moving to 4th level enters into those levels. In the 2nd, 3rd and 4th levels the snake is allowed to move past the walls of the game window and reenter through the opposite wall. The game gets abruptly over in all levels of the game when it touches its own body. More complexity is added in these levels by introducing another character 'Eagle' chasing the snake.

In the 4th round extra complexity is added by introducing an another snake which also chase the snake. These additional characters are introduced to confuse the player and thereby induce the player to make mistakes and they do not otherwise cause any harm. The game can be paused at any time in the middle of the game and continue later from the same point.

2D animation is used in the movement of eagle and the rival snake. MySQL Database management application will be used to save the scores and to retrieve the same. To add to the aesthetics of the game ant animation scene is embedded with snake scene. There will be 20 ants which move about freely and collect the leaves found in its nearby vicinity to bring them to the centrally located nest and deposit them there. Some moths invade the nest and get killed by being bitten by the ants. The ants hunt the moth and carry the dead moth to the nest to deposit there. Now all these characters ant, moth, leaves, eagle, rival snake, the player snake and other items become part of the same world. Each will be busy doing its own activity. The player will be allowed to stop the game in any of the levels and continue later from the same point..

In this project various changes have been introduced to vanilla Snake Game. In this implementation of the snake game the rules of the game slightly varies for the same action in each level, for example game will be over in the event of snake touching the walls in level 1 but in other levels it is not so. In other levels it can exit through a wall and enter the scene from the opposite wall.