*SPACE INVADERS*

**B**y: Alap Gohar

**CMS ID**: 502082

**BSAI-1A**

**Project Description**  
Space Invaders is a classic arcade game in which user leads a spaceship to fight through waves of invading aliens. The game is built using Python's "pygame" library for the game development, offering an interactive and fun experience. With functionality to move left and right, fire bullets at enemies, and dodge falling bombs, the player's increasing skill will make the game more challenging.  
**Game Structure**  
1. **Main Menu**

* It begins with a main menu with a title of the game and two options:  
   1) Pressing "Enter" key to START  
   2) Pressing "Esc" key to exit

2. **Player Spaceship**  
 a. Moves horizontally across the screen as the spaceship that the player controls. It also shoots bullets. The bullets destroy the enemy invaders.  
 b. Starts out with 3 lives. For every bomb from an enemy that hits the player, one life is lost.  
3. **Enemies**  
 a. There are 6 alien enemies appearing on the screen at once, each having its own position and also having its movement pattern.  
 b. The enemies move horizontally. When they hit the edges of the screen, they reverse their direction to moving down towards the player  
4. **Bullets**  
 a. The player shoots a bullet to eliminate the alien enemies.  
 b. The bullets move upward and will reset itself once it disappears at the top edge of the screen or hits an enemy.  
5. **Bombs**  
 a. The enemies drop bombs at intervals, hitting the spaceship of the player.  
 b. If the player is bombed then he loses one life. The game closes when the player has no lives.  
 6. **Score and High Score**  
 a. The game also displays the present score accumulated by the player with every destroyed enemy.  
 b. The high score feature keeps track of the highest score attained in all games played as the high score will be kept in a " .txt" file which is in the directory.  
**7. Game Over and Restart**  
 a. The game goes in " Game Over" state if the player loses his last life or if the enemies are going to touch the baseline of the spaceship. In that "Game Over" state, the current score and the high score will be displayed.  
 b. Game Restart  
To restart the game, use the 'R' key.  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* **How to Play**  
  1**. Initial Game Screen**  
   Start the game to see the menu screen and try to play by entering through the 'Enter' or quit by using the 'Escape'.  
  2. **Player Keys Control**  
   o Use Left Arrow Key to move the spaceship to the left  
   o Use Right Arrow Key to move the spaceship to right.  
   o Spacebar for shooting bullets to destroy enemies.  
  3**. Gameplay**  
   o You should destroy all the enemies coming in your way and collect points for it.  
   o Don't get crashed by the bombs that the enemies will drop down.  
   o The game would be over if an enemy reaches the bottom of the screen or you've lost all of your lives.  
  **4.Resuming the Game**  
   o When you see the screen "Game Over," you can resume the game by tapping the 'R' key.  
  **5.Scoring and High Score**  
   o The score is displayed at the top left while the lives are displayed at the top right.  
   o The highest score is updated and saved when a new highest score is achieved.  
  **Installation Prerequisites**  
  •   Python: Python should be installed in your computer.  
  •   pygame library: Install by running the pip install pygame command.
* Extract the zip file in a directory and then run the code because there are a bunch of extra files along with the code.

**References**

• The skeleton of the basic game was first coded after the guidelines provided on the following "freecodecamp" video:  
<https://www.youtube.com/watch?v=FfWpgLFMI7w&t=2>s  
• This video gave a very good idea of how pygame works and then I went on to personalize this game by adding a lot of new features that were in my mind.  
• The following features were added on my own using online resources and were not present in the tutorial:  
Main Menu, Restart Screen, High Score Saver and Lives, and Enemy dropping BOMBS.  
• Here's the code just as it is in the video uploaded by the tutor  
<https://github.com/attreyabhatt/Space-Invaders-Pygame/blob/master/main.py>