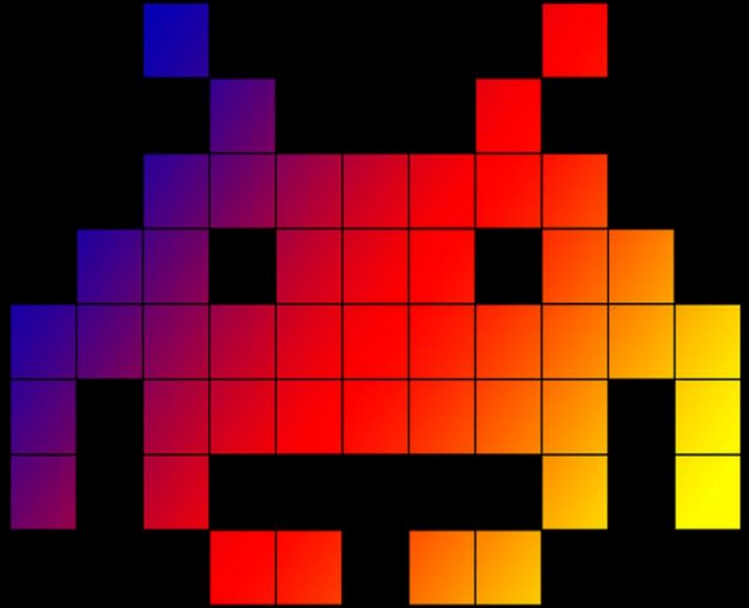


CLONE INVADERS

It is time again to save the
planet UTONIA from the
aliens.

CO 1302 PROGRAMMING FOR
ENGINEERING

GAME PROJECT 2020
GROUP 07



Finito
Creations

CONTENT

- OVERVIEW _____ pg 3
- GAMEPLAY _____ pg 4
- BASIC_FEATURES _____ pg 5
- ADVANCED_FEATURES _____ pg 6
- OBJECTS _____ pg 7
- FUNCTIONS_RELATED_TO_CONSOLE _____ pg 8
- CHALLENGES AND ERRORS _____ pg 9

OVERVIEW

- The object of the game is to shoot the alien invaders and keep them off the ground while eliminating them.
- "Space Invaders" became one of the first coin-op video arcade games to enjoy mega-success worldwide. In 1980, Atari released a home version of the wildly popular arcade game for its popular home video game system. Teen-agers and college students spent hours at the local arcade (or wherever one of the game machines was placed) using a single laser base trying to defeat an army of alien creatures who camped in grid-like formation, slowly but perilously approaching Earth in five fights. The format of the game was identical, this time with the laser base defending Earth against 36 of the alien creatures (arranged in a 12-by-2 formation). As in the arcade game, the object was to defeat the aliens before they reached Earth (with the aliens speeding up as the warrior advance in the game); while losing three laser bases also meant the game over. If the player destroyed all 36 aliens, he was rewarded with a new army of 36 aliens, this time positioned with harder aliens than before. User will need to win all five levels to win the game. If any level fails, that level will appear again until player wins it. Also, aliens can fire devious bullets while the player can only shoot straight bullets.



Figure 1: Frictional Image

GAMEPLAY



Figure 2: game play preview

- The player's ship is represented by a character (w) on the screen. The player controls the ship by using the left and right arrow keys (to turn), There are no brakes!
- The ship also has a gun, which can be fired with the "space bar" key.
- The asteroids are represented by "@" keys on the screen. When a player's bullet collides with an asteroid, the asteroid is disappeared and points are added to the player's score. Asteroids are shooting too and their bullets are represented by "^" keys.
- The space ship has 3 health levels. If an asteroid bullet collides with the player's ship, then the player loses a life (or the game).

BASIC FEATURES

- First player can input his/her name.
- The players ship, can move horizontally to right and left sides.
- The ability to fire bullets from ship.
- The invader ships also can fire bullets and player's bullet can encounter them.
- The player's score should be displayed and score go up when an invader is destroyed.
- The invaders appear on the screen and can be destroyed by the players bullet.
- The invader also can fire bullets and player's bullet can encounter them.

```
*****
*****Clone Invaders*****
*****

*****CLONE INVADERS*****CLONE INVADERS*****CLONE INVADERS*****CLONE INVADERS

Movements

Right Arrow Key      -      Move Right
Left Arrow Key       -      Move Right
Space bar            -      Fire

Console

Escape Key           -      Change Full Screen
```

Figure 3: Controls of the game

ADVANCED FEATURES

- A new level can start or player can exit when all the invaders are destroyed.
- Player's health also displayed and with single enemy bullet hit health goes down from one point.
- Enemy's ship should be destroyed with one player's bullet.
- Player can read date specially time while playing.
- Full screen functionality.
- Player can switch full screen mode while playing.
- Press on the screen to pause.

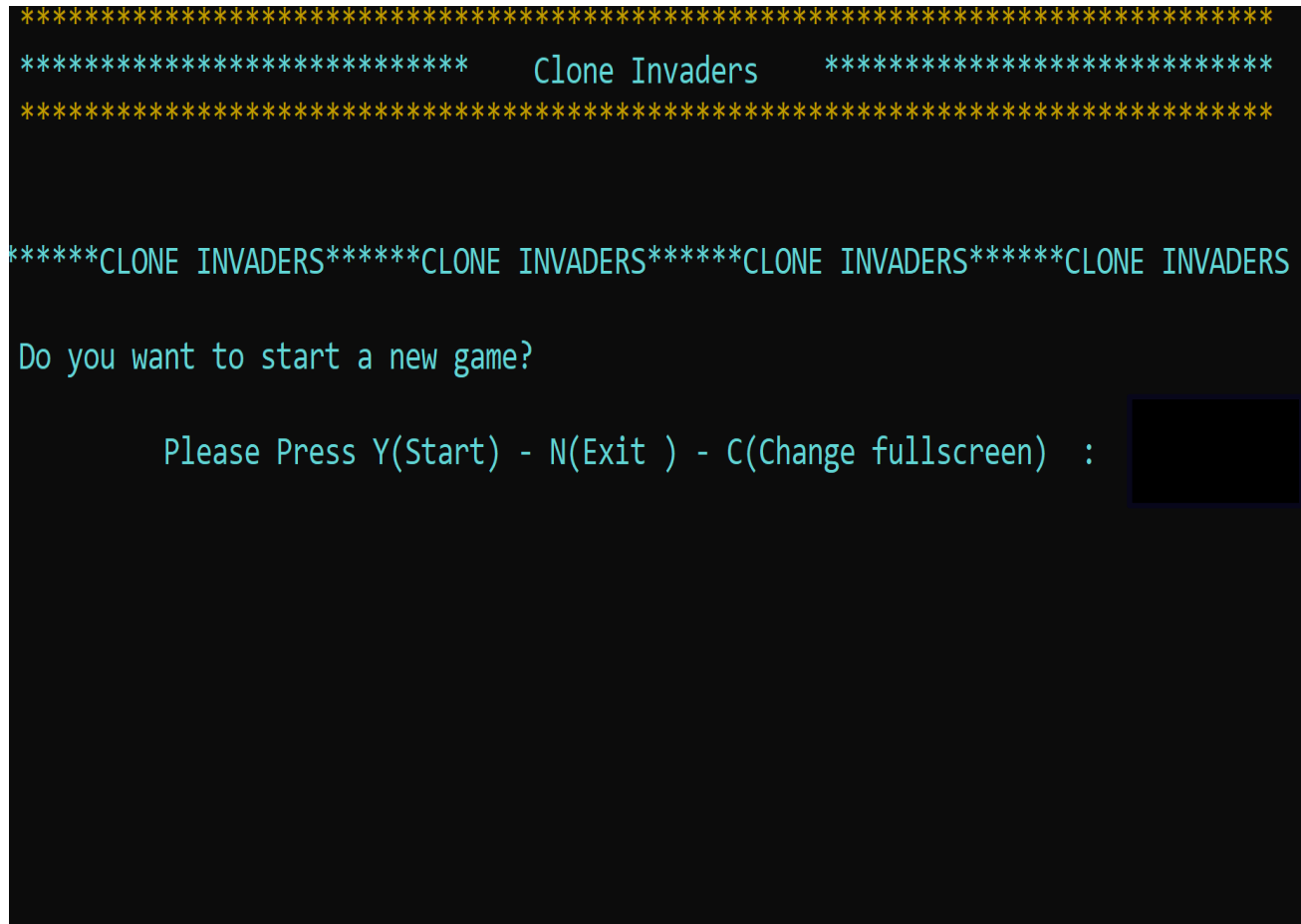


Figure 4: Progress Screen

At the beginning User can decide whether to use full screen or not. (Recommended to use full screen)
Then user data is taken in the next screen. User can provide a name and game will give a title to the player.
Maximum characters for the username are set to 8.

Then the instruction Screen will be loaded. (figure 8)

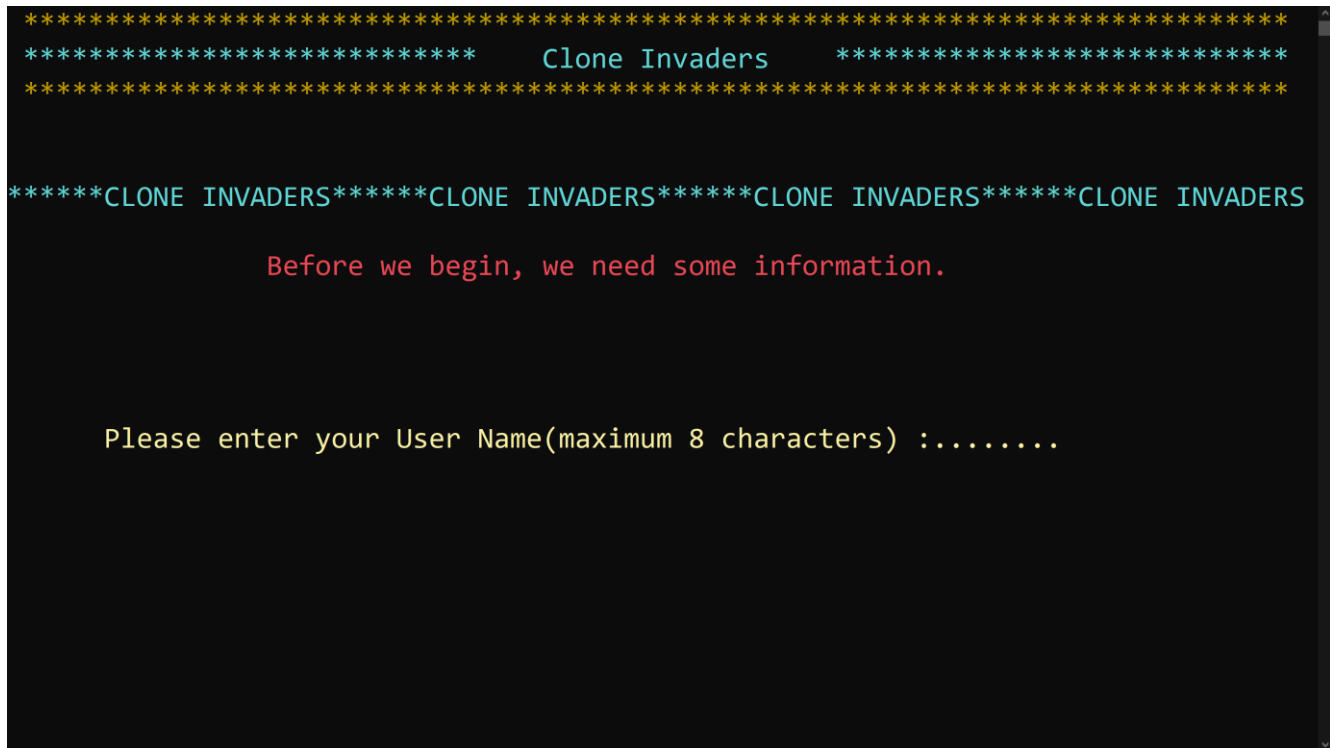


Figure 5 :User data

Gameplay was described above and when the user finishes a game, he/she can view game statistics.



OBJECTS

- PLAYER
 - This will represent the player's ship on the screen. (W)
- BULLET
 - The player's ship can generate bullets. Once created, the bullets move on the screen independently of the ship.
- INVADERS
 - The invader ships are not move on the screen. The steady in same position and shoot bullets. That bullets enemy's' ships fire moves toward the player's ship. So, invader bullet can move x coordinates and y coordinate too. (zig zag movement)
 - Map of Characters is used to control the Invaders, Bullets and player by using switch statement. Always true while statement is added for real time input checking.

```
15 //creating a 2-D array of characters as the game workarea for easy access
16
17 char Map[11][51] = {
18
19     "#####",
20     "#                               X #",
21     "# @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ #",
22     "# @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ #",
23     "#                               #",
24     "#                               #",
25     "#                               #",
26     "#                               #",
27     "#                               #",
28     "#                               W #",
29     "#####",
30
31 };
32
```

Figure 6: Character Map

- **SCORE BOARD**
 - The score board keeps track of and displays the score, number of health and current date and time.
- **Variables**
 - MaxHealth (Integer)
 - YourHealth (Integer)
 - GamePoints (Integer)
- **Functions**
 - Real time score.
 - Both Health and Points are displayed.

FUNCTIONS RELATED TO CONSOLE

- **Handler is used to change font colour.**

```
VOID WINAPI SetConsoleColors(WORD attribs)
{
    HANDLE hOutput = GetStdHandle(STD_OUTPUT_HANDLE);

    CONSOLE_SCREEN_BUFFER_INFOEX cbi;
    cbi.cbSize = sizeof(CONSOLE_SCREEN_BUFFER_INFOEX);
    GetConsoleScreenBufferInfoEx(hOutput, &cbi);
    cbi.wAttributes = attribs;
    SetConsoleScreenBufferInfoEx(hOutput, &cbi);
}
```

- **Handler is used to change font size.**

```
void fontsize(int a, int b)
{
    PCONSOLE_FONT_INFOEX lpConsoleCurrentFontEx = new CONSOLE_FONT_INFOEX();
    lpConsoleCurrentFontEx->cbSize = sizeof(CONSOLE_FONT_INFOEX);
    GetCurrentConsoleFontEx(out, 0, lpConsoleCurrentFontEx);
    lpConsoleCurrentFontEx->dwFontSize.X = a;
    lpConsoleCurrentFontEx->dwFontSize.Y = b;
    SetCurrentConsoleF
}
```

- **Console resolution is set to full screen mode.**

```
void Fullscreen()
{
    keybd_event(VK_MENU, 0x38, 0, 0);
    keybd_event(VK_RETURN, 0x1c, 0, 0);
    keybd_event(VK_RETURN, 0x1c, KEYEVENTF_KEYUP, 0);
    keybd_event(VK_MENU, 0x38, KEYEVENTF_KEYUP, 0);
}
```

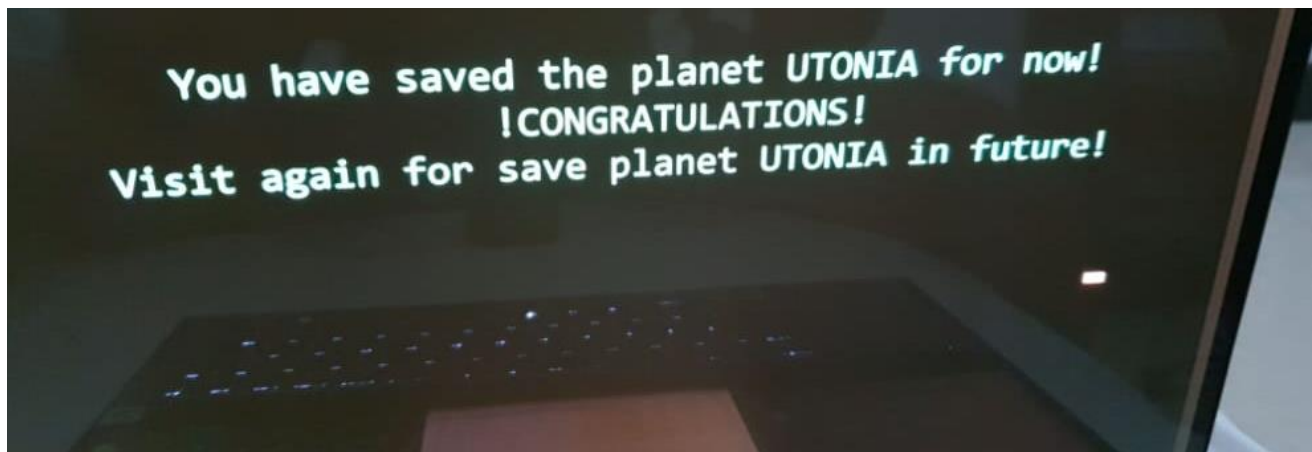
Complete code :

https://drive.google.com/file/d/1Ze0s8blxEw_S5Evag5B5jc06PxUugMMQ/view?usp=drive_sdk

CHALLENGES and ERRORS

1. Since a challenge was set not to use libraries, a very important part of a game, audio files were not added. Only default system sound is used. (Background music is added as a comment for future development)
2. Since no game engine can be used, aliens(invaders), bullets and the player have represented as characters. (no pictures are were used)
3. Setting up the refresh rate was so hard decision as this is a console game, computer performance directly affect the performance of the game.
4. Since this is a console game increasing difficulty may not visible due to the computer behavior.
5. Since this game must be run using DevCPP some commands which are working on VisualStudios could not be used. (needed to define them before use)
6. Since this was developed as a group, order of the code may not in order.
7. Input buffer has an error in the progress loading screen. (it is not cleared)

To prevent that clear the pre-printed characters



TEAM FINITO **CREATIONS**

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All members equally contributed to the assigned task 100%.

Special Thanks!

- 1.Programiz.com (<https://www.programiz.com/>)
- 2.Github.com (<https://github.com/>)
- 3.StackOverflow.com (<https://stackoverflow.com/>)
- 4.TutorialsPoint.com (<https://www.tutorialspoint.com/>)
5. Cplusplus.com (<http://www.cplusplus.com/>)