## PICPD - Design of Physical Interface & Client Printing Data

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**Introduction:**

In this task, we have used the same game of spaceships and controlled it using Arduino. We have included the maximum number of sensors and actuators as we can.

Both of the players use different sensors to control the spaceships.

**Sensors:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Nº** | **Name** | **Player** | **Use** | **Connection** |
| 1 | Rotary | 1 | rotate the spaceship | Analog pin A4 |
| 2 | Button | 1 | Shoot bullets | Digital pin 3 |
| 3 | Tilt | 1 | tilt the spaceship | Digital pin 2 |
| 4 | Joystick | 2 | Tilt and rotate the spaceship by rotating the joystick. When pressed it is used to shoot | Analog pin A0 |

**Actuators:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Name** | **Player** | **Use** | **Connection** |
| 5 | LED | - | To check that the changes in the Arduino code are uploaded. | Digital pin 13 |
| 6 | LED Bar | 1 | Know the number of lives. The number of leds light up according to the number of remaining lives. | Digital pin 8. |
| 7 | LCD Screen | 2 | Know the number of lives. Shows the string as “*Player1 lives: 3*” | Digital pin 11 |



*Image of the arduino connected with sensors and actuators*

**Basis of the interface design:**

We have decided to design the interface in this way, as we have two players, it is comfortable for the players to place the sensors for each players correctly. The rotary, button, tilt and led bar of player 1 is on one side of the arduino and joystick, lcd screen of player 2 is on the other side.

If other sensors are added to the player 2, then it is difficult to play along with joystick. And that is why we have decided to have only joystick for the player 2, with all controls in one.

To know the remaining lives of the players we have used the led bar and lcd screen, which lights up and it gets the attention of the players.

Notes:

Attaching the libraries needed for LCD screen ( the folder SerialLCD) and LED bar ( the folder Grove\_LED\_Bar-master). These folders should be copied inside *C:\Program Files (x86)\Arduino\libraries.*