

Carnival Game

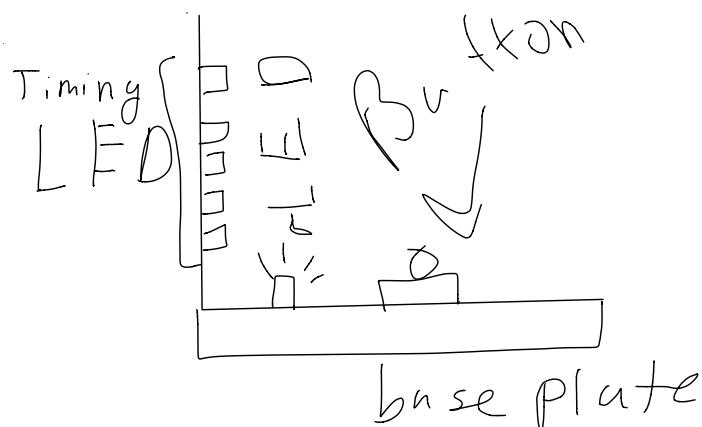
Design Brief

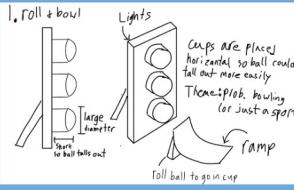
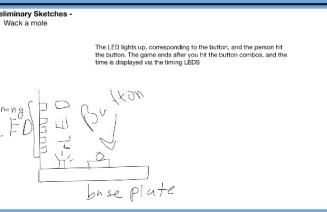
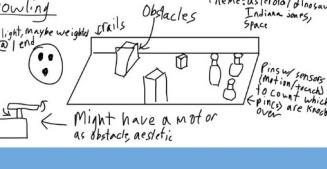
- Client: Chicago Carnival Game
- Designers: Akash Chandra &
- Design statement: Make a carnival game that is fun, modern, and is appropriate for everyone ages 3+.
- Constraints:
 - Must keep score and have a win/ loose state
 - Game must be reset within 30 seconds
 - Must have a theme
 - Must fit into black and yellow box with lid closed
 - Only one cortex and one base plate used
 - Must have
 - 2 inputs
 - 2 outputs
 - Code must have comments
 - Runners must prove game is beatable
 - One custom part must be used
- Deliverables: CAD, design brief, game

Preliminary Sketches -

Wack a mole

The LED lights up, corresponding to the button, and the person hit the button. The game ends after you hit the button combos, and the time is displayed via the timing LEDS

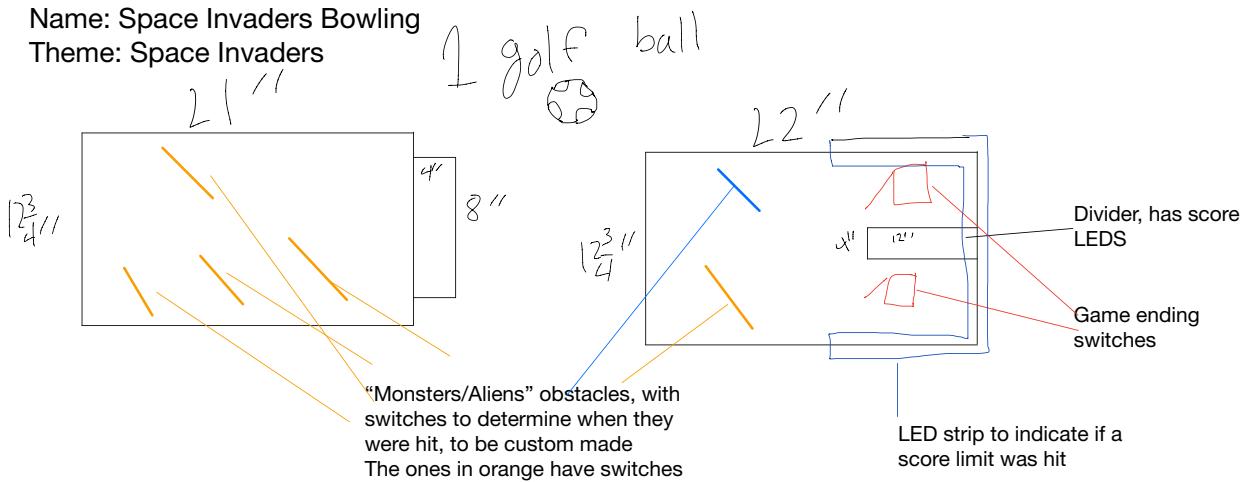


	A Solutions	B Fits in Box	C Has theme clearly expressed	D Uses only one baseplate and cortex	E Is not a scam	F Can be reset in 30 seconds	G Must keep score	H Has 2 inputs and outputs	I Suitable for ages 3+	J One custom made part (0 (None) - 1 (Has One))	K Totals
1											
2		5	3	5	1	5	2	5	4	1	31
3		5	1	4	5	3	5	5	4	0	32
4		4	5	5	4	4	5	5	5	1	38

Decision Matrix

Final sketch -

Name: Space Invaders Bowling
 Theme: Space Invaders



1. Pins and monsters
 2. Use LED strip
 3. Some monsters have point values if hit
 4. Score is kept in binary
- are custom made

Data collected-

Quantitative data -

1. Inputs and Outputs
 - A. 7 inputs, the five obstacles in the way and the two switches at the end of the game
 - B. 4 outputs, the three LEDs to keep score and the switch for the LED strip
2. The game took around five to ten minutes to set-up, as all 7 switches and 3 LEDs, along with one relay needed to be plugged into the cortex, and the board needed to be set up.
3. The project's cost
 - A. In terms of supplies
 - a. 6 pieces of wood
 - b. 7 limit switches
 - c. 6 laser cut monsters/aliens
 - d. 6 laser cut stands
 - e. 3 LEDs
 - f. One relay
 - g. One RGB LED strip
 - h. One power supply
 - B. In dollars
 - a. Wood pieces, from scraps: \$0
 - b. Power supply: ~\$75
 - c. RGB LED strip: ~\$25
 - d. Relay: ~ \$7
 - e. Laser cut wood: ~\$30
 - f. **Total cost:** ~\$137
4. The game took up an area of 776.18 inches squared or would fit with room to spare in a 12.75 in W * 58.4 in L rectangle.

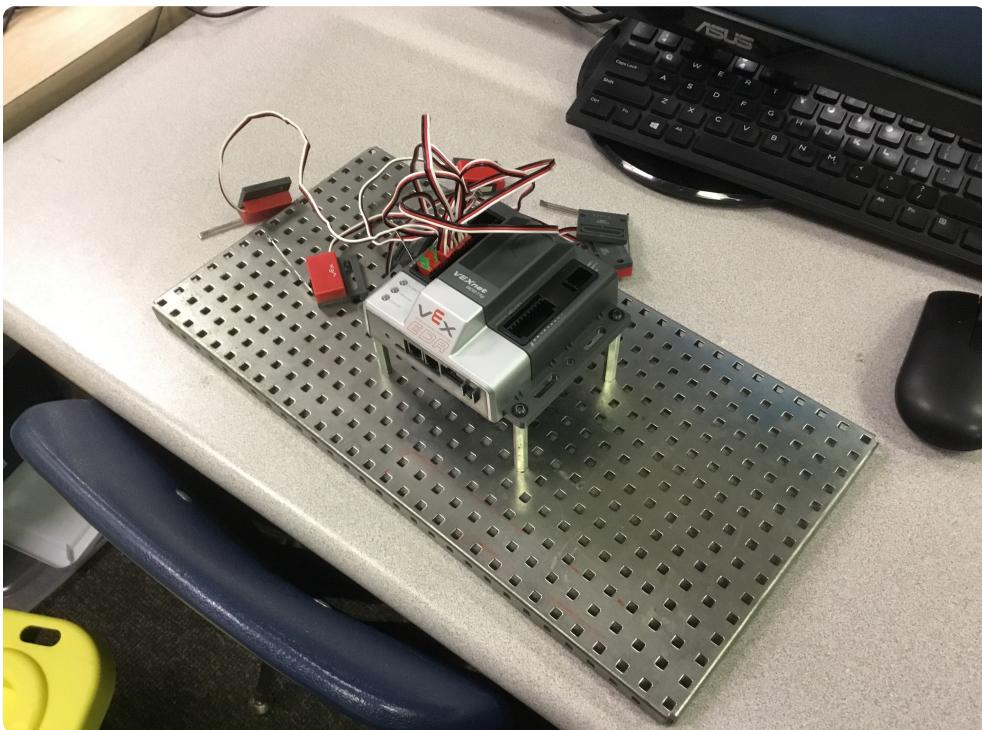
Qualitative data -

Question	Yes responses	No responses
Is the theme clear?	3	1
Is the game fun?	4	0
Is the game difficult?	3	1
Can this game be cheated?	4	0
Is it aesthetically pleasing?	4	0
Do you like it?	4	0

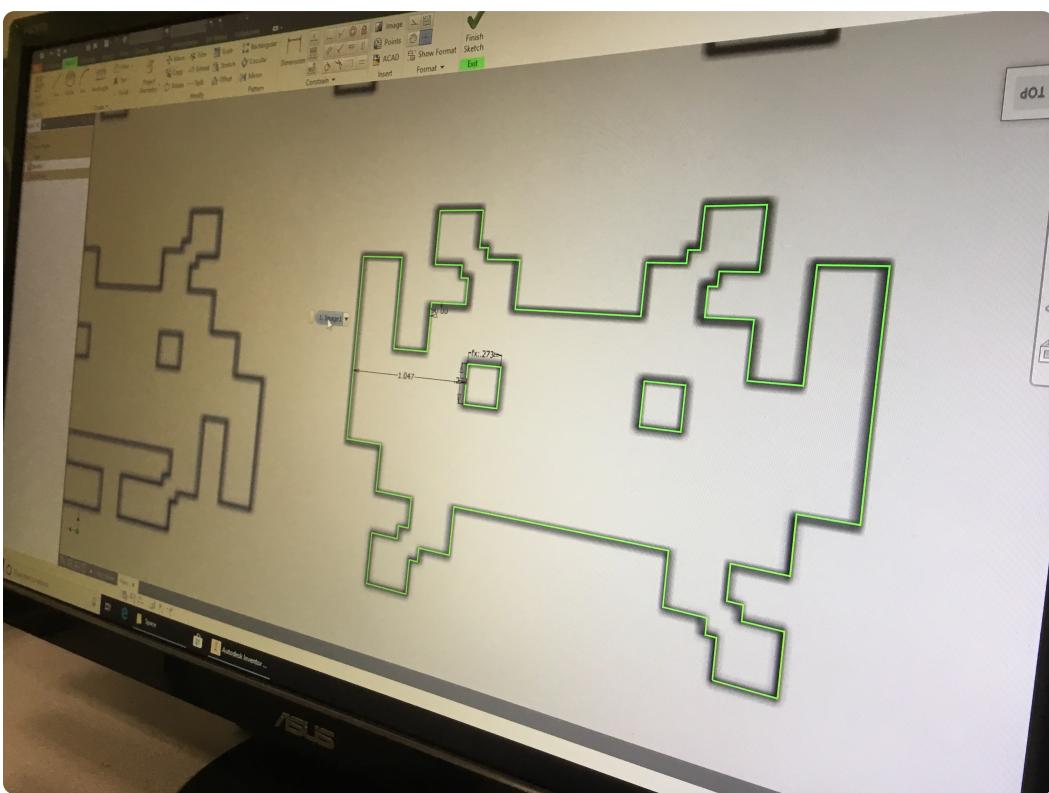
Code: <https://github.com/AkashChandra-02/SpaceInvaders/blob/master/Code/Code.c>

CAD: <https://github.com/AkashChandra-02/SpaceInvaders/tree/master/CAD%20Files>

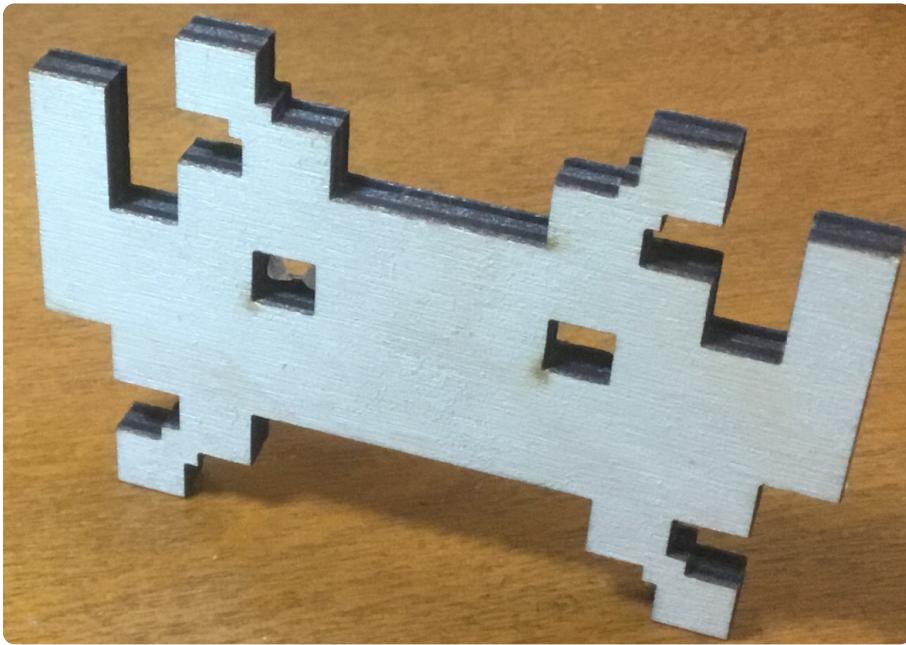
Photos



The prototype of the game, with all the switches and LEDs



The CAD design being made



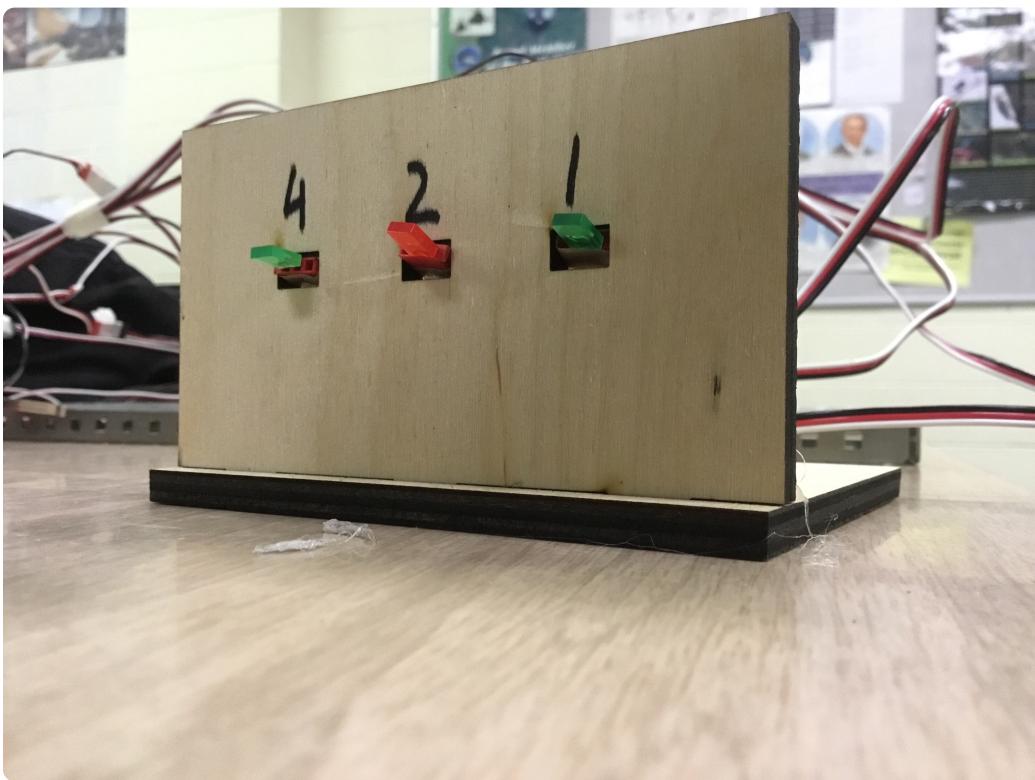
The laser cut monster , 1 out of 6



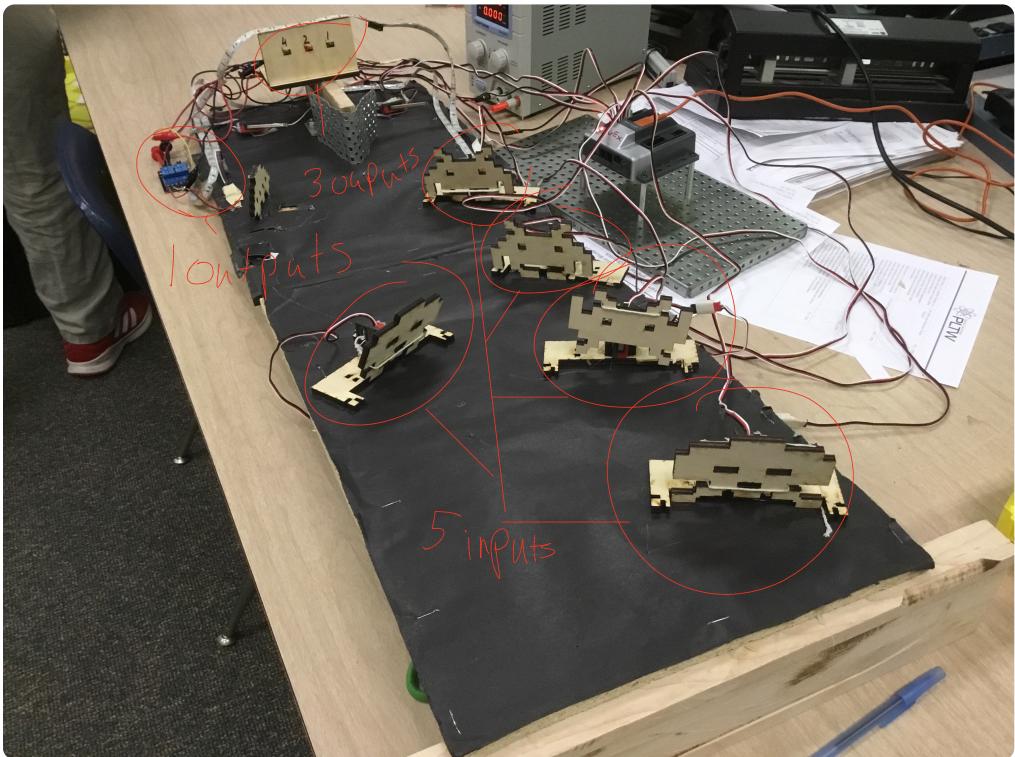
The beginning of building the game



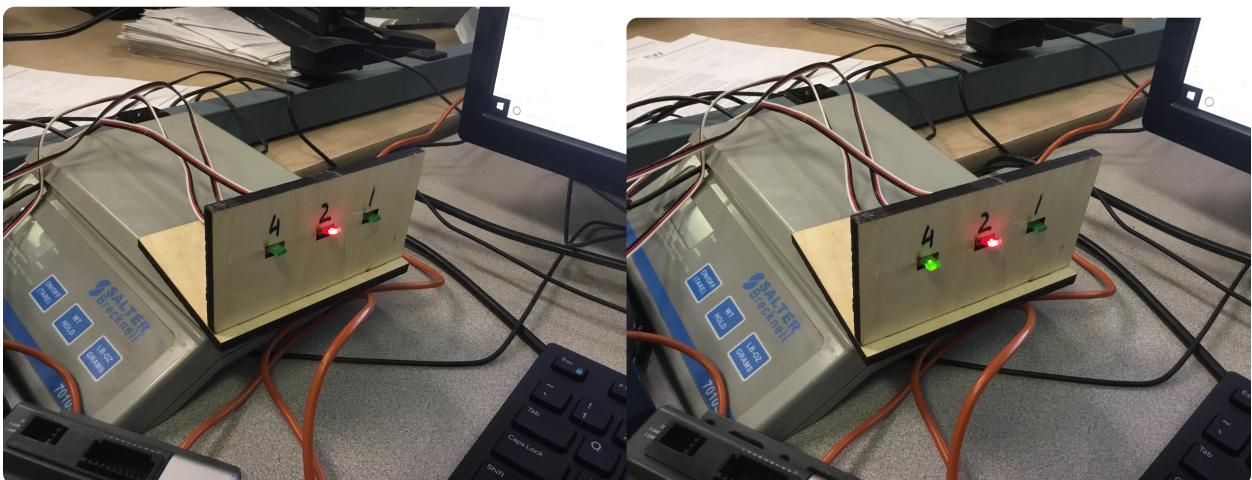
The final steps of putting the game together



The LED scoreboard



The final game



The score board with a value of 2

The score board with a value of 6

Videos

Sadly, we did not get any videos of the game working

Reflection - what went well (evidence), what went poorly (evidence, why), what would you do differently (connected with poorly)

The most major problem was the LED strip relay wouldn't work or the flawed laser cutting for the stands. The relay was fixed by trial and error. It took 5 tries, but in the end, it worked flawlessly. The flawed laser parts were used to secure the switch to the game board. I did some research into the CNC router, laser cutter, and the 3D printer, trying to find the best machine to use, and that dictated the way I did that CAD. We used the design matrix heavily. We went with the design that had the most points, however, we had modified it by removing the motors Abu wanted, because that would make it more complex. The prototype that we made was successful. One minor negative was the wires and pins became a problem as it was hard to manage. One positive was how easy it was to add and remove switches or LEDs. The construction of the actual game was straightforward, with the only major negative was the stands weren't cut correctly, which was a setback we were able to overcome by reusing the pieces. The physical prototype was a great success and worked to all of my expectations, in most aspects. The software and physical components worked excellent, however, the aesthetics weren't the best. It still worked well, despite its mediocre aesthetics. Everyone seemed to enjoy the game, however they felt they didn't understand what was happening. That was probably the fault of the people that ran the game, not the game itself. I think the idea to use the Space Invaders Monsters, due to the fact that the younger children didn't get the "retro" aesthetic. Our groups primary method communication was simply meeting and talking in class. It was effective. The theme was Space Invaders, because it seemed simple to implement. We implemented the theme well, however, for little children, it was hard to recognize the aliens as Space Invaders. The biggest we had was trying to implement the LED strip. It was too complex for the scope of the game. We had gotten it working, but it wasn't the best idea. I learned to keep things as simple as possible.

