**Space Invaders Design**

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The essential features of Space invaders are a horde of alien flyers descending on a planet, with a player controlled cannon able to shoot back at them. To ensure replayability, a scoring system with some sort of "High Score" mechanism is nearly essential. Also in the nearly essential category is the ability of the aliens to shoot at the planet. Less important are features such as bunkers to hide in, a life regeneration feature, different types of aliens, and a bonus ship flying past.

The player controlled cannon is constrained to move across the bottom of the screen. As such only three commands are necessary: left, right, and fire. There are three possible interfaces. First would be to implement on screen buttons. Having to move the mouse from button to button is probably much too slow of an interface for compelling gameplay, however. The second would be to tie the commands to keyboard button presses. Under either interface the intention would be to have each button/key press move the player a set amount. The third interface would be to have the player cannon track the x-position of the mouse exactly. The Fire command would then be bound to one of the mouse button clicks. Under all three interfaces, a limitation on the player fire rate would likely need to be implemented.

The alien ships will be spawned in an array. The original design of 5 rows of 11 ships seems adequate. The array will move across the width of the screen moving down one notch and reversing direction when one of them contacts the edge of the screen. (Thus if an entire column of aliens is eliminated, it will require that many more moves for the remaining array to reach the edge of the screen.) The original appears to only have the bottom (remaining) member of each column shoot, but rather than implementing such a tracking mechanism, I opted to separate out the projectiles into enemy and player categories. Thus enemy projectiles are only checked for impact with the player cannon and not with other enemies. Correspondingly, the player projectiles are only checked for impact with enemy craft. (This is, of course, barring the implementation of the bunkers for the player to hide behind.)