

## Isaac Woods – Arduino written report

### Instructions:

- Naming:
  - Use right and left buttons to select letters
  - Use up and down buttons to change selected letter
  - Press select button to submit pet name
- Menus:
  - Use up and down buttons to scroll through menu options
  - Press select button to choose the shown option
  - For the main pause menu, press the select button to show it
- Pet controls:
  - Press the down button to feed the pet, increases fullness by 1
  - Press the right button to play with the pet, increases happiness by 1
  - Press the up button to grow the pet, increased development stage by 1 (if it's at least 35 seconds old, happiness is at least 1, and fullness is at least 3)
  - ADDITIONAL CONTROL – When in development stage 2, press the left button to feed the pet 'fizzy pop drink', increases happiness by 2.

### Features:

- Start-up
  - Arduino checks for a present save in EEPROM by checking the first memory location for a marker of 0 or 1
    - If save is present, presents the option of loading it or starting new in a sub-menu
    - If there's no save it moves on to the next step
- New pet
  - ADDITIONAL FEATURE - Upon starting a new pet, the user can give it a three character name. They do this by cycling through the alphabet of the three characters. To show which character is selected at any time, I created an arrow character and an inverted arrow character (white arrow in black box), this is so that the inverted arrow is present for the selected character.
  - ADDITIONAL FEATURE – When the new pet's stats are shown, they are shown with one of three small 8-bit style sprites I created that represent an animal. This updates along with the change of the pet's development stage, going from egg to two other animal sprites
  - The pet's stats are displayed very plainly, beneath a counting timer of it's age. The stats are formatted to show the current development stage ("D"), happiness ("H") and fullness ("F").
  - Happiness and fullness start at 2 and 3 respectively, all other stats at 0
- Main pet development
  - After 5 seconds, the egg hatches and shows a new sprite, and the happiness and fullness begin to drain every 7 and 11 seconds respectively. These timers are done without the use of a delay, but instead takes two time readings and checks if a certain interval has passed.

- (See above manual for which buttons do what) – When fed, the pet’s fullness increases by 1, and if it reaches the maximum of 4 then happiness resets to 0. When played with, the happiness increases by 1 if fullness is at least 2. The pet grows to development stage 2 (updating the sprite again) if 35 seconds have passed and happiness and fullness are at least 1 and 3 respectively
- Main Menu
  - OPTIONAL ADDITION - When the select button is pressed, it opens up the main menu and pauses the progression of the pet and it’s timers, allowing the whole simulation to be paused. (see user manual above for how to navigate the menu) Within this menu, the user can:
    - Save – write the pet’s stats and name to the EEPROM. I decided to allow the user to still continue from this point instead of stopping it running, so they have the option to turn off the Arduino when they want, or if they want to carry on after saving
    - Delete – simply deletes the current save on the EEPROM by changing the ‘save present’ bit from a 1 (true) to a 0 (false), therefore it assumes the memory here can be overwritten at another time
    - Start new – Simply resets all variables to their default, sets timers to the current time (using millis() ) and lets the user rename the pet
    - Leave the menu
- End of timer
  - ADDITIONAL FEATURE – When the timer reaches 9 minutes 59 seconds, I made it so the current pet lays a new egg and flees to live the rest of it’s life in the wild. This new egg hatches to have the parent pet’s name with a new “Jr.” suffix (e.g. BEN Jr.). This is done simply by resetting the stats and timers as if starting a new pet, but keeping the name the same. This means that all saves have an additional bit that can indicate whether the pet is a “junior” or not.
- Development stage 2
  - ADDITIONAL FEATURE – When in development stage 2, the pet’s maximum happiness and fullness are increased by 1, now being at 3 and 5 respectively.
  - ADDITIONAL FEATURE – When in development stage 2, the happiness stat drains 2x as fast (every 3.5 seconds) and fullness drains every 9 seconds instead of 11.
  - ADDITIONAL FEATURE – When in development stage 2, the pet can be fed fizzy pop drinks by pressing the left button. This increases the happiness stat by 2 even if fullness is 0. Being fed this fizzy pop drink does not increase fullness.

