
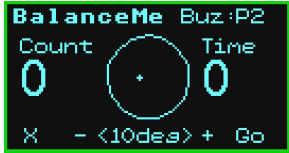
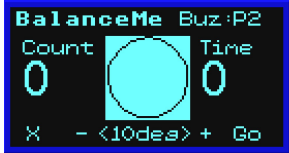




Buzzer Plug into P2	DFR0032		 
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Context

- This app emulates an egg-and-spoon race.
- The onboard accelerometer is used to simulate the spoon. The egg is a dot within a circle on the screen.
- Time and number of drops at the finish of a race is transmitted to the teacher's Kookaberry for display on the classroom smartboard or monitor

What is on the screen

1. **Top:** The name of the app with the Buzzer shown as being plugged into P2
2. **Middle:** The circle is the “spoon” and the dot is the “egg”. When the egg is dropped (ie the dot goes outside the circle), the circle shows a white rectangle behind the circle. Each time the egg is dropped, the Count timer increments by one. The Time counter shows the second elapsed since the Go button (Button B) is pressed.
3. **Bottom:** **Button A** is Exit from application; **Button C** reduces the diameter (ie the angle of tilt beyond which the algorithm deems the egg to be dropped) of the spoon; the default angle is 10 degrees; **Button D** increases the diameter of the spoon; and **Button B** stops and starts the race. When **Button B** is pressed to start the race, the indicator changes to **Stp**. When it is pressed to stop the race, it changes back to **Go**.

Directions for BalanceMe app

1. Plug the buzzer into plug **P4**
2. Run the **BalanceMe** app.
3. Use **Buttons C&D** to increase or decrease the diameter (angle) of the spoon. This is useful if you need to handicap certain players; or make it easier for some.
4. Press Button B to start the race and the Count and Time registers. The indicator changes to **Stp**.
5. Have the participant move steadily around a fixed course - with obstacles like a chair to climb over. Have them press **Button B** as they cross the Finish line
6. The time taken to go around the course, plus the number of times they have dropped the egg, will be shown on the screen.



- Pressing **Button B** as they finish will store the **Name** (of the Kookaberry), **Angle**, **Time**, and **Count** data in the USB memory and also transmit the data to a teachers' Kookaberry running the **ListenLog** app.

Directions for using BalanceMe app with the ListenLog app

- Run **ListenLog** on the teacher's Kookaberry and wait for transmissions from Kookaberry's running the **BalanceMe** app as each participant presses **Button B** as they cross the finishing line.
- The data received by the ListenLog app can be retrieved from the USB memory when power is disconnected from the teacher's Kookaberry, and then connected to the teacher's computer. The results can then be displayed on the classroom smartboard or monitor.

Mathematical Question: Who won?

Two variables are measured for each race - Count (egg drops) and Time (to go around the course).

Q: A participant can go around quickly with a lot of drops; or slowly with very few drops. How can you work out who has won?

A: It depends on the mechanism used to turn two variables into one variable. Multiply them; add them; average them? The table below shows a table of actual results and the various ways described. Which way is best.....or fairest?

1 Analysis of Data from BalanceMe App Race						
2						
3	Name	Angle	Time (T)	Count (C)		
4	John3	10	120	5	Data From Kookaberry Log File	
5	John2	10	100	8		
6	John4	10	150	2		
7	John1	10	60	12		
8	John5	10	240	1		
9	John 6	10	100	2		
10	John 7	10	60	25		
11						
12 Who Has Won?						
13		TxC	T+C	T-C		T/C
14	John3	600	125	115	24	
15	John2	800	108	92	12.5	
16	John4	300	152	148	75	
17	John1	720	72	48	5	
18	John5	240	241	239	240	
19	John 6	200	102	98	50	
20	John 7	1500	85	35	2.4	
21						
22		Fastest	Least Drops			
23	John3	120	5			
24	John2	100	8			
25	John4	150	2			
26	John1	60	12			
27	John5	240	1			
28	John 6	100	2			
29	John 7	60	25			
30						

Different ways of reducing two variables to one variable

Time(T) is in Seconds
Count(C) is number of drops

Winner is the person with the lowest value of the single variable

Which way of combining the variables seems to be the fairest
Discuss!



Algorithm (BalanceMe app)

1. Read Kappconfig file for data pertaining to the running of this app (eg, Learning plan number; radio channel)
2. Read the angle set in the display (default 10 degrees)
3. Set buzzer timings and limits on how many drops permitted before timer is reset (This to avoid a participant racing around the course with no care about how many times the egg is dropped)
4. Prepare the data logging CSV file (eg, column headings) and initialise the screen display.
5. Establish button conditions
6. Close and reset for next operation when Button B is pressed a second time