

Instructions

The menu

This is where all the other applications are drawn from. There is (as said in the documentation) a basic UI made to allow easy navigation through each application. To run this menu you need to select the executable file named Run.sh (click execute, not execute in terminal to run) this will then open after initialising, the pause that occurs is due to the collection of files being drawn on. This slight delay occurs with every application due to the way it draws files, there was however no way to remove this. The tests below are shown in the order that they are available through the menu. We have also added in an extra function which is placed at the bottom of the menu, this is an exit function which when the joystick is pressed in will initiate the closing of the menu and the program.



Figure 1 this is the shutdown image

To clarify which options are which here is a short simple list of the options

1. Arrow reaction
2. Caterpillar
3. Lights off
4. Maze
5. Memory
6. Pong
7. Speed
8. Exit

Game 1: Arrow reaction

This is the very first game we have created for the Pi, once selected this game is very simple to understand. This is a reaction based game and is the first option available.

1. A countdown from 3 down to 1 will begin
2. An arrow will appear on the LCD screen after the countdown
3. The user must then react as quickly as possible by moving the joystick in the direction that the arrow on the display is pointing
4. Then the users time will be shown across the screen and recorded
5. This is repeated automatically 3 times

Game 2: Caterpillar

This game is reaction based, a green dot (the Caterpillar) will appear as will a red dot (the Apple). The aim is to move the green dot (Caterpillar) to collect the red dots (apples) therefore extending the caterpillar body. This is then the second option available.

1. The game will start with a fast moving green dot
2. The joystick is used to move the green dot (Caterpillar)
3. A red dot will appear on the screen and this is the apple
4. The user then directs the caterpillar toward the apple with the joystick
5. If the user hits the border or 'eats' themselves then it's game over
6. The aim is to eat many apples (red) and grow the caterpillar (green)
7. The game will then flash seven times to indicate where you died

Game 3: lights off

This game is all about logic, a large amount of yellow dots will appear at random points around the area. The aim is to turn off all the lights. This is the third option.

1. The game will initialise with a few lights being switched on
2. A plus (+) shape will also appear after a very short period
3. This is the cursor and can be controlled by the joystick
4. When the centre button of the joystick is pressed the areas covered in the white will be switched on (if they're off) or switched off (if the light is on)
5. To move the cursor use the joystick
6. Once all the lights are off the game ends
7. In order to exit the game if it is too difficult which it may be, there is a blue dot at the edge of the screen
8. Move the cursor into the blue dot and then press the joystick and the game will quit

Game 4: Maze

This is a blend of both reaction and logic. The maze game involves a procedurally generated maze with an exit point at a random location. As the user progresses a small bar will fill in the bottom left indicating how far the user has left to travel. The controlled object is in white and the walls are in red with the exit being green. Once the exit is reached the user is returned to the menu. Fourth option on the menu.

1. The game starts with the map having been generated and the users cursor in the top left of the map overall (there are some boundaries)
2. Then to move the cursor the joystick is used allowing you to navigate through the series of dead ends leading to the exit
3. As the bar at the bottom left begins to fill, it indicates how close the user is to the exit along the X axis
4. Once it is full the user must navigate around that area to find the exit
5. Once reached the user must navigate the cursor over the top and then that's game over

Note: there may be occasions where there is not enough time to fully complete so to exit in emergency press the joystick in for 3 seconds and it will exit.

Game 5: Memory

This test is as described in the documentation, it involves series of 4 lights which illuminate in a random order through a series of levels of difficulty. This is a more logical game, so due to the high levels of difficulty possible the user has 3 failed attempts available before being returned to the menu. Fifth option available.

1. The series of lights will begin once the test has loaded starting with only a few illuminating in sequence (the light will flash)
2. The screen will then go blank indicating the user is now active
3. Then the current light selected will be in white and to move the cursor simply use the joystick
4. To select a light simply press the joystick in
5. Make sure to follow the order
6. If you fail once you will have 2 more attempts available throughout the game and then if you fail once more you will only have one more attempt available. Once that has gone it's game over
7. If the combination you use is correct then a green tick will be displayed, if you do not succeed a red cross will appear and one of your tries gone.

8. Once the 3 tries are had then the user will be returned to the menu

Game 6: Pong

This game is a mix of both reaction and a little bit of logic due to the way the ball moves (which is only at 45° angles) with the aim being too last as long as is possible. Sixth option available.

1. The white paddle will appear on the left side and the ball (red dot) will appear at a set point and will head to the right side
2. The ball will then bounce off at a 45° angle on any wall it hits
3. The user then moves the paddle to where the ball is going and then the ball will bounce away
4. Once the user misses the ball the screen will freeze for a short moment to show that it hit and that's game over

Game 7: Speed

This is a reaction test. This involves a line of 3 green dots (the vehicle) proceeding through a road as though there were blockages throughout. The aim is to steer the vehicle around them and as you proceed further and further the speed you move at increases, hence the name speed, if you hit the blockage its game over. Sixth option available

1. The game starts with the red border and the vehicle on the screen
2. The vehicle may not look like it is moving however it is so once the first turning comes up quick reactions are needed to get round
3. So in order to control the vehicle the joystick is used once more
4. As said above while you progress your speed increases meaning the time available to go round the corners is limited.
5. Once you hit the blockage then the game will stop and return the user to the menu

The menu itself

The overall menu allows all the selections of the different tests in one easy to use UI (user interface). Each game has its own animation that is displayed if an option is highlighted, then if the user decides they want to complete that test then they press the joystick in.