Checkpoint 2

1)

Pin	Symbol	Explaintion
1-8	Ch0-Ch7	Inputs for analog signals to be converted into digital signals by the ADC
9	DGND	Pin provides a ground connection to the ~~portions~~ of the circuits inside the ADC that control the digital signals. (this is done not to mix the analog & digital signals inside the ADC chips)
10	$\overline{CS}$/SHDN	This pin controls when the chip is initiated & 'turned off.' When 'pulled high' (ie: when a high voltage* is passed through it, or 1) the ~~transistor~~ ADC will be put on low power stand by & when 'pulled low' (ie: wen a low voltage** is passed through it, or 0) the ADC will be initiated
11	Din	This pin sends digital signals into the ADC (in this case to enable the ADC to communicate w/ the Raspberry Pi)
12	Dout	This pin ~~outputs~~ allows for the output of digital signals that the ADC has converted from analog signals
13	CLK	Pin that controls sampling rate ~~&~~ of the ADC & clock out every bit of the signal conversion done by the ADC
14	AGND	Pin provides a ground connection to the circuits in the ADC that control the analog signals
15	Vref	This provides a constant analog signal voltage that will be used as a referance when comparing input analog signals & converting them to digital signals.
16	VDD	This pin supplies the current needed to operate the ADC chip.

* in this case; 3,3V

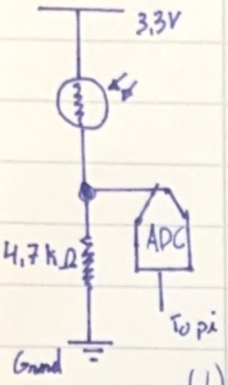
** in this case; 0V

2)

Method Name	Return value explination
. analogCount()	Returns the number of channels available on the ADC
. analogResolution()	Returns the resolution of the ADC in bits
. analogMaximum()	Returns the maximum integer that the ADC can output (limitation of available bits)
. analogReference()	~~Returns integer value of the digital signal being output from desired channel~~
. analogRead(int) *	Returns integer value of the digital signal being ~~output~~ input from the desired chanel.
. analogReadFloat(int) *	Returns float value of the digital signal being ~~input~~ output from the desired chanel
. analogReadVolt(int)	Returns the voltage being input from the desired channel
. analogReadAll()	Does same as their respective methods (see above) but will ~~output~~ Returns the readings for all available channels in form of a list.
. analogReadAllFloat()	
. analogReadAllVolt()	

* will return the float/int of the digital signal corresponding to the analog signal being input from desired channel

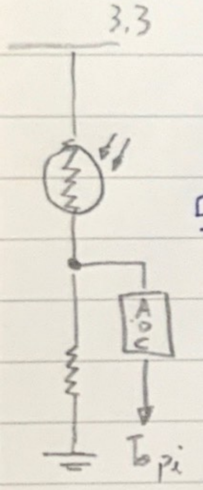
3) The most direct ADC output is that of 0V or any voltage less than the min-resolution of the ADC as it will always correspond to the minimum digital number possible that the ADC can output.



In order to find what the final voltage output of the ADC, the following formula can be employed:

$$\text{ADC Values} = \frac{\text{AnalogMesuredVoltage} \times \text{Resolution of ADC}}{\text{System volage}}$$

4) As an LDR has an inverse relation between light intensity & Resitance, when the LDR is covered by the hand, it's resitance increases. As the LDR is set up in a voltage divider w/a fixed resistor, the output Voltage when the LDR is covered will decrease. The ADC will read this reduced voltage & will compare it to the constant 'reference voltage'. The ADC will then use that comparison (which will be lower than the previous ~~volt~~ input voltage) & output a reduced digital signal (ie: number).



5)

Pin	Symbol	Explination
1	V_{DD}	This pin supplies the current needed to operate the ADC chip
2	NC	
3	$\overline{\text{CS}}$	When pulled low, this pin will enable the DAC to preform data funtions & Serial clock (ie: timing)
4	SCK	Pin that ~~enables the~~ controles the Serial clock of the DAC
5	SDI	Controls the Serial data input, Enables communication between the RaspberryPi & the DAC
6&7	NC	
8	$\overline{\text{LDAC}}$	When this pin is pulled low, the DAC will output the specified voltages from both Voltage out pins.
9	$\overline{\text{SHDN}}$	When this pin is pulled low, the DAC will shut down, seasing any more volage output from the Voltage output pins.
10	V_{OUTB}	The two (seperate) output channels of the DAC. Output voltages will come out of these pins
14	V_{OUTA}	
11	V_{REFB}	Provides a constant voltage that can be used as a referance in order to correctly output the desired voltage ~~of~~ to the output pins. Each reference voltage pin acts as a referense for it's respective output voltage channel
13	V_{REFA}	
12	V_{SS}	Pin that provides a ground connection for the entire circuitry in the DAC.