

Neuron Sandbox Expanded Worksheets

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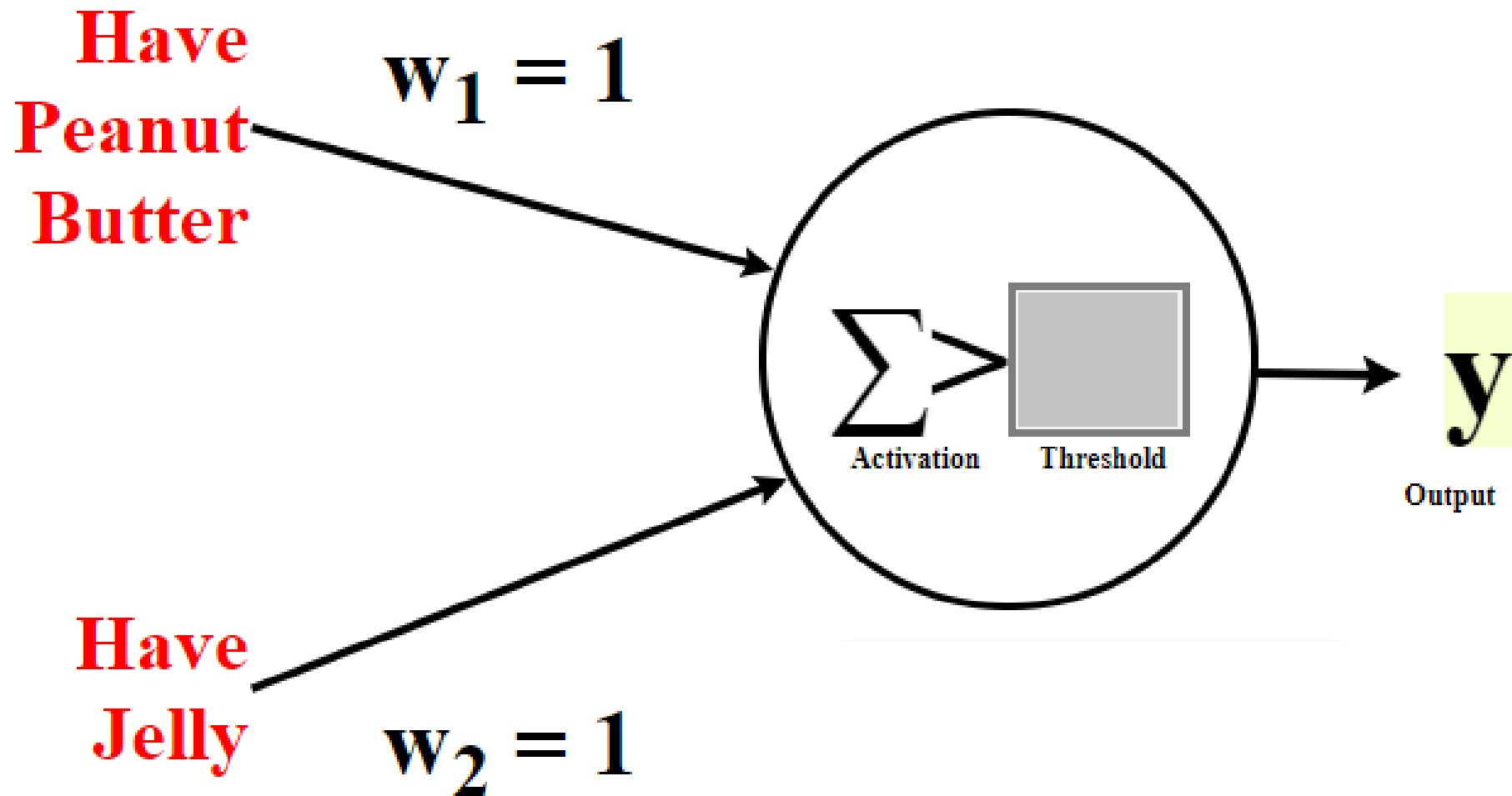


Artificial Intelligence
For Georgia

#1. Can I make a peanut butter and jelly sandwich? I need both peanut butter and jelly.

INPUTS		Solve for Weighted Input 1:	Solve for Weighted Input 2:	ACTIVATION	Do we want the activation in column C to be greater than the threshold?	Determine the threshold:	Is activation greater than threshold?	DESIRED OUTPUT
				Take the weighted inputs from column B and add them together		<i>What decimal number is greater than your Ns but less than your Ys?</i>	<i>(If the answer doesn't match the 0 or 1 in the <u>desired output</u>, change your threshold.)</i>	What is the correct answer for each case?
Input ₁ Have peanut butter 0 - No 1 - Yes	Input ₂ Have Jelly 0 - No 1 - Yes	Weighted Input ₁ W ₁ = 1 Input ₁ x W ₁ = __	Weighted Input ₂ W ₂ = 1 Input ₂ x W ₂ = __	Activation Sum of Weighted Inputs 1 & 2	Should activation be above threshold? (Y or N)	Threshold Write the number you want to use for the threshold	Is Activation > Threshold ? Write 0 for no or 1 for yes.	Desired Output 0 - No 1 - Yes
0	0	<u> 0 </u> x 1 = 0	<u> 0 </u> x 1 = 0					
0	1	<u> </u> x 1 = <u> </u>	<u> </u> x 1 = <u> </u>					
1	0							
1	1							
								Start Here
		B		C	D	E	F	★ A ★

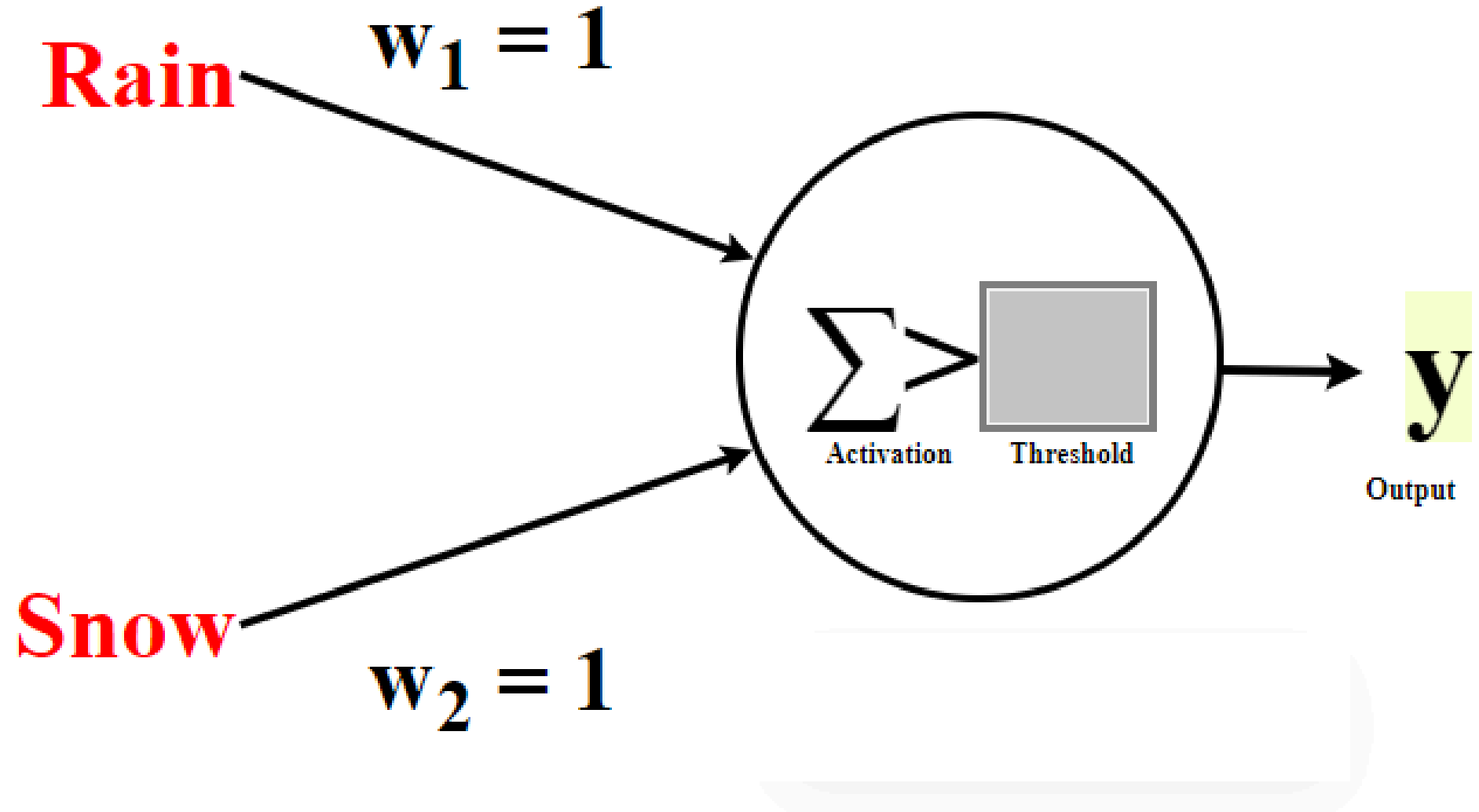
#1. Can I make a peanut butter and jelly sandwich? I need both peanut butter and jelly.



#2. Should I wear boots today? I should wear boots when it is raining or snowing.

INPUTS		Solve for Weighted Input 1:	Solve for Weighted Input 2:	ACTIVATION	Do we want the activation in column C to be greater than the threshold?	Determine the threshold:	Is activation greater than threshold?	DESIRED OUTPUT
				Take the weighted inputs from column B and add them together		<i>What decimal number is greater than your Ns but less than your Ys?</i>	<i>(If the answer doesn't match the 0 or 1 in the <u>desired output</u>, change your threshold.)</i>	What is the correct answer for each case?
Input ₁ Is it raining? 0 - No 1 - Yes	Input ₂ Is it snowing? 0 - No 1 - Yes	Weighted Input ₁ W ₁ = 1 Input ₁ x W ₁ = __	Weighted Input ₂ W ₂ = 1 Input ₂ x W ₂ = __	Activation Sum of Weighted Inputs 1 & 2	Should activation be above threshold? (Y or N)	Threshold Write the number you want to use for the threshold	Is Activation > Threshold ? Write 0 for no or 1 for yes.	Desired Output 0 - No 1 - Yes
0	0	<u> 0 </u> x 1 = 0	<u> 0 </u> x 1 = 0					
0	1	<u> </u> x 1 = <u> </u>	<u> </u> x 1 = <u> </u>					
1	0							
1	1							
								Start Here
		B		C	D	E	F	★ A ★

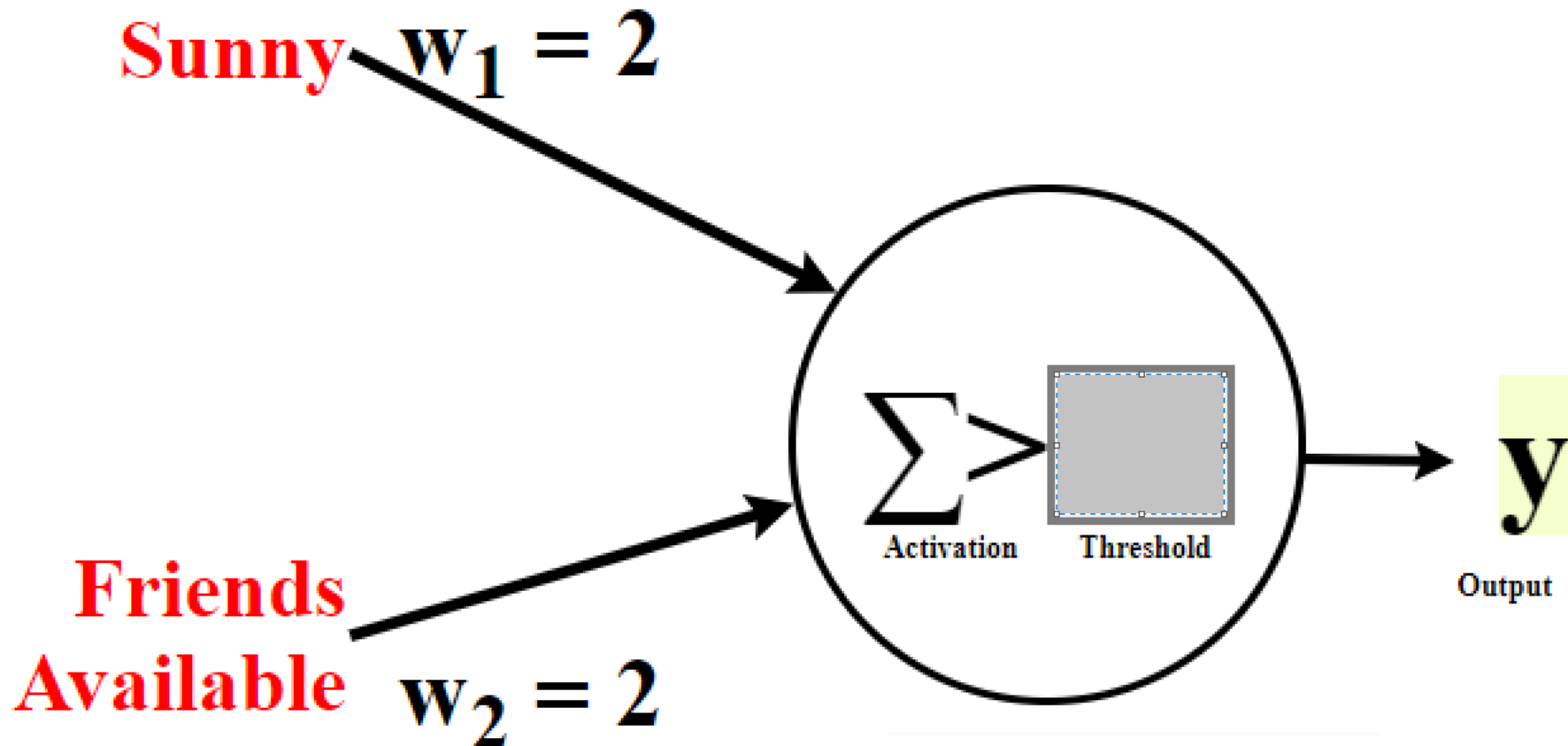
#2. Should I wear boots today? I should wear boots when it is raining or snowing.



#3. John is planning a picnic with friends. He wonders if today is a good day for a picnic. It is a good day for a picnic if it is sunny outside and his friends are available today.

INPUTS		Solve for Weighted Input 1:	Solve for Weighted Input 2:	ACTIVATION	Do we want the activation in column C to be greater than the threshold?	Determine the threshold:	Is activation greater than threshold?	DESIRED OUTPUT
				Take the weighted inputs from column B and add them together		<i>What decimal number is greater than your Ns but less than your Ys?</i>	<i>(If the answer doesn't match the 0 or 1 in the <u>desired output</u>, change your threshold.)</i>	What is the correct answer for each case?
Input ₁ Is it sunny? 0 - No 1 - Yes	Input ₂ Are friends available? 0 - No 1 - Yes	Weighted Input ₁ W ₁ = 2 Input ₁ x W ₁ = __	Weighted Input ₂ W ₂ = 2 Input ₂ x W ₂ = __	Activation Sum of Weighted Inputs 1 & 2	Should activation be above threshold? (Y or N)	Threshold Write the number you want to use for the threshold	Is Activation > Threshold ? Write 0 for no or 1 for yes.	Desired Output 0 - No 1 - Yes
0	0	<u> 0 </u> x 2 = 0	<u> 0 </u> x 2 = 0					
0	1	__ x 2 = __	__ x 2 = __					
1	0							
1	1							
								Start Here
		B		C	D	E	F	★ A ★

3. John is planning a picnic with friends. He wonders if today is a good day for a picnic. It is a good day for a picnic if it is sunny outside and his friends are available today.

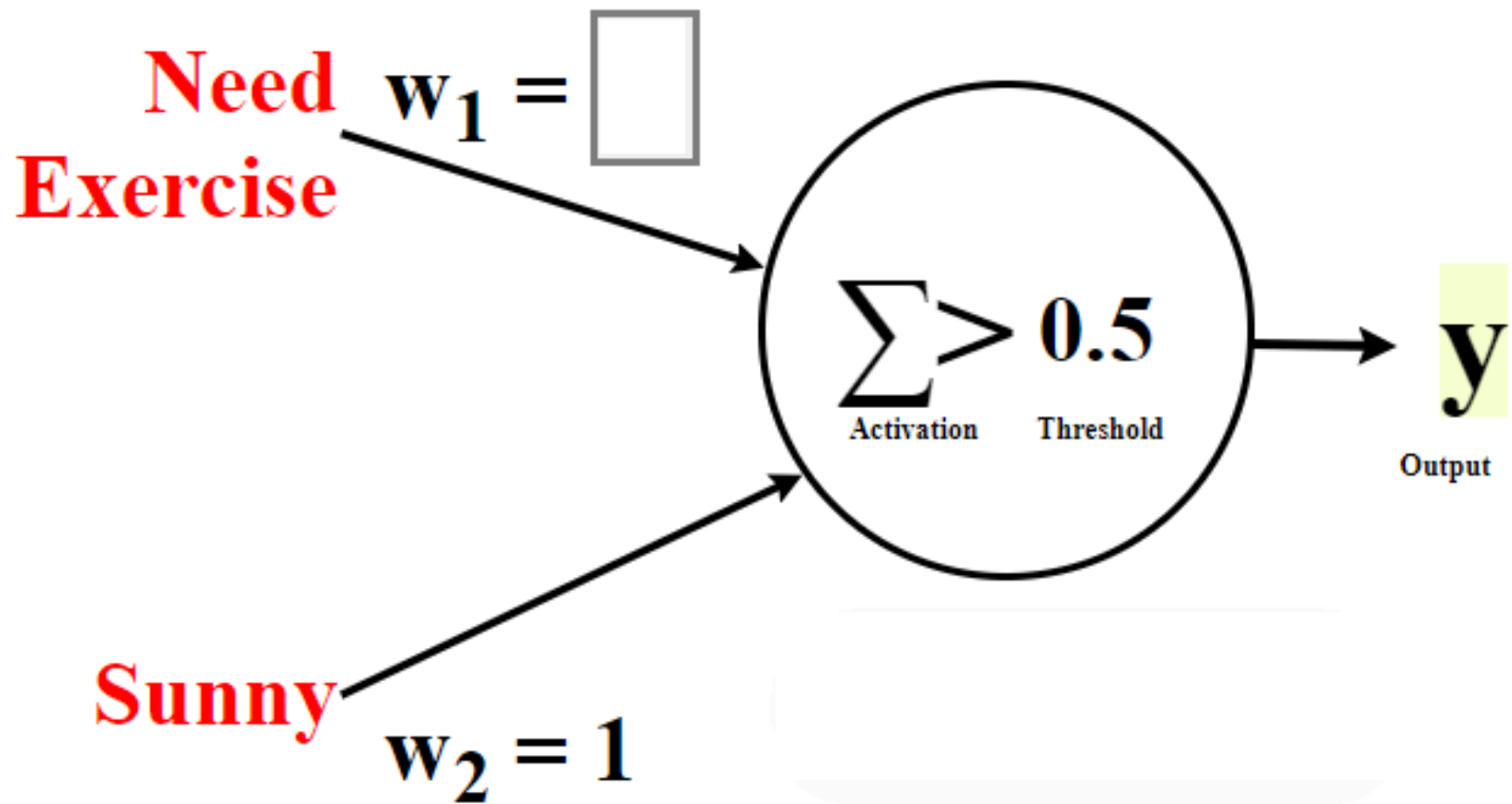


NEW WORKSHEET: "Solve for Weight"

#4. Should I play outside? I would play outside either if I need exercise or if it's sunny.

INPUTS		Should activation be above threshold? <i>Answer should be based on the <u>desired output</u> (column A)</i>	Type of constraint on weight W_1 <i>Either “greater than” or “less than”</i>	Margins for Weight W_1	Solution for Weight W_1 <i>What value for W_1 satisfies all constraints in columns C+D?</i>	Compute Weighted input 1	Weighted input 2	ACTIVATION	Is activation greater than threshold? <i>If the answer doesn’t match the 1 or 0 in the <u>desired output</u>, go back to column E</i>	DESIRED OUTPUT		
Input ₁	Input ₂		If column B is “Y”, put “>” here. If column B is “N”, put “<” here.	Take the threshold 0.5 and subtract Weighted Input 2 (column G)	Example: If C+D says “> 0.5” then the value of W_1 must be something greater than 0.5	$W_1 = \underline{\hspace{1cm}}$ from E $\text{Input}_1 \times W_1 = \underline{\hspace{1cm}}$	$W_2 = 1$ $\text{Input}_2 \times W_2 = \underline{\hspace{1cm}}$	Sum of weighted Inputs 1 & 2 (columns F and G)	Activation > Threshold ? Is column H > 0.5 Write 0 for no or 1 for yes.	Desired Output 0 - no 1 - yes		
0	0		Constraints on W_1 only make sense when Input ₁ is active (not 0)			$\underline{0} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$0 \times 1 = \mathbf{0}$					
0	1					$\underline{0} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$1 \times 1 = \mathbf{1}$					
1	0						$0.5 - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$\underline{1} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$0 \times 1 = \mathbf{0}$			
1	1						$0.5 - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$\underline{1} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$1 \times 1 = \mathbf{1}$			
		B	C	D	E	F	G	H	I	★ A ★		

#4. Should I play outside? I would play outside either if I need exercise or if it's sunny.



Answer to:

#4. Should I play outside? I would play outside either if I need exercise or if it's sunny.

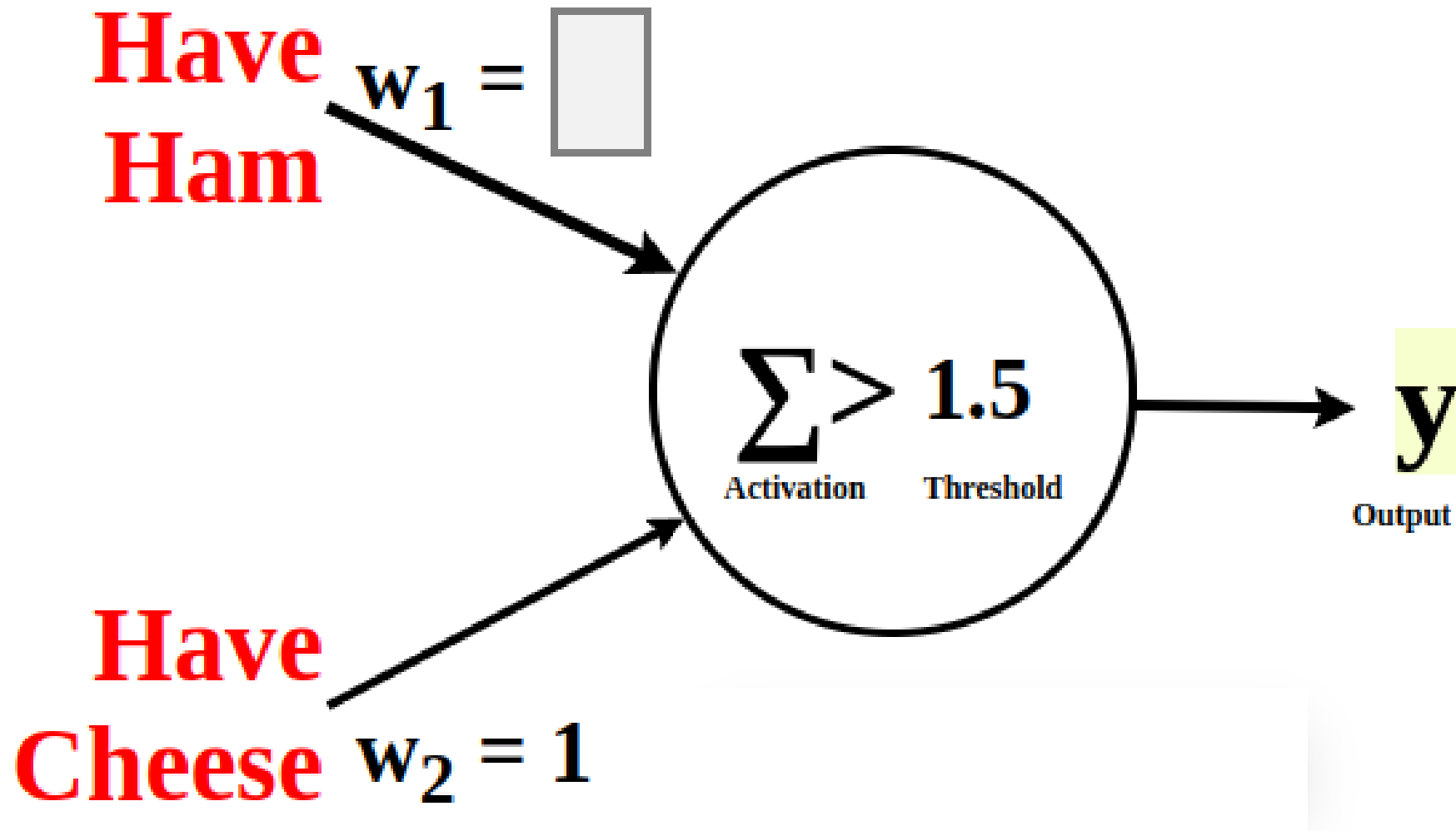
INPUTS		Should activation be above threshold? <i>Answer should be based on the <u>desired output</u> (column A)</i>	Type of constraint on weight W_1 <i>Either "greater than" or "less than"</i>	Margins for Weight W_1	Solution for Weight W_1 <i>What value for W_1 satisfies all constraints in columns C+D?</i>	Compute Weighted input 1	Weighted input 2	Activation	Is activation greater than threshold? <i>If the answer doesn't match the 1 or 0 in the <u>desired output</u>, go back to column E</i>	DESIRED OUTPUT
Input ₁	Input ₂		If column B is "Y", put ">" here. If column B is "N", put "<" here.	Take the threshold 0.5 and subtract Weighted Input 2 (column G)	Example: If C+D says "> 0.5" then the value of W_1 must be something greater than 0.5	$W_1 = \underline{\hspace{1cm}}$ from E $\text{Input}_1 \times W_1 = \underline{\hspace{1cm}}$	$W_2 = 1$ $\text{Input}_2 \times W_2 = \underline{\hspace{1cm}}$	Sum of weighted Inputs 1 & 2 (columns F and G)	Activation > Threshold ? Is column H > 0.5 Write 0 for no or 1 for yes.	Desired Output 0 - no 1 - yes
0	0	N	Constraints on W_1 only make sense when Input ₁ is active (not 0)		1 (could be any value greater than 0.5)	$0 \times \underline{1} = \underline{0}$	$0 \times 1 = 0$	0	0	0
0	1	Y				$0 \times \underline{1} = \underline{0}$	$1 \times 1 = 1$	1	1	1
1	0	Y	>	$0.5 - \underline{0} = \underline{0.5}$		$1 \times \underline{1} = \underline{1}$	$0 \times 1 = 0$	1	1	1
1	1	Y	>	$0.5 - \underline{1} = \underline{-0.5}$		$1 \times \underline{1} = \underline{1}$	$1 \times 1 = 1$	2	1	1
		B	C	D	E	F	G	H	I	★ A ★

NEW WORKSHEET: "Solve for Weight"

#5. Can I make a ham and cheese sandwich? I need both ham and cheese.

INPUTS		Should activation be above threshold? <i>Answer should be based on the <u>desired output</u> (column A)</i>	Type of constraint on weight W_1 <i>Either “greater than” or “less than”</i>	Margins for Weight W_1	Solution for Weight W_1 <i>What value for W_1 satisfies all constraints in columns C+D?</i>	Compute Weighted input 1	Weighted input 2	Activation	Is activation greater than threshold? <i>If the answer doesn't match the 1 or 0 in the <u>desired output</u>, go back to column E</i>	Desired Output
Input ₁	Input ₂		If column B is “Y”, put “>” here. If column B is “N”, put “<” here.	Take the threshold 1.5 and subtract Weighted Input 2 (column G)	Example: If C+D says “> 0.5” then the value of W_1 must be something greater than 0.5	$W_1 = \underline{\hspace{1cm}}$ from E $\text{Input}_1 \times W_1 = \underline{\hspace{1cm}}$	$W_2 = 1$ $\text{Input}_2 \times W_2 = \underline{\hspace{1cm}}$	Sum of weighted Inputs 1 & 2 (columns F and G)	Activation > Threshold ? Is column H > 1.5 Write 0 for no or 1 for yes.	Desired Output 0 - no 1 - yes
0	0		Constraints on W_1 only make sense when Input ₁ is active (not 0)			$0 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$0 \times 1 = \mathbf{0}$			
0	1					$0 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$1 \times 1 = \mathbf{1}$			
1	0			$1.5 - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$		$1 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$0 \times 1 = \mathbf{0}$			
1	1			$1.5 - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$		$1 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	$1 \times 1 = \mathbf{1}$			
		B	C	D	E	F	G	H	I	★ A ★

#5. Can I make a ham and cheese sandwich? I need both ham and cheese.



Answer to:

#5. Can I make a ham and cheese sandwich? I need both ham and cheese.

INPUTS		Should activation be above threshold? <i>Answer should be based on the <u>desired output</u> (column A)</i>	Type of constraint on weight W_1 <i>Either “greater than” or “less than”</i>	Margins for Weight W_1	Solution for Weight W_1 <i>What value for W_1 satisfies all constraints in columns C+D?</i>	Compute Weighted input 1	Weighted input 2	Activation	Is activation greater than threshold? <i>If the answer doesn't match the 1 or 0 in the <u>desired output</u>, go back to column E</i>	Desired Output
Input ₁	Input ₂		If column B is “Y”, put “>” here. If column B is “N”, put “<” here.	Take the threshold 1.5 and subtract Weighted Input 2 (column G)	Example: If C+D says “> 0.5” then the value of W_1 must be something greater than 0.5	$W_1 = \underline{\hspace{1cm}}$ from E $\text{Input}_1 \times W_1 = \underline{\hspace{1cm}}$	$W_2 = 1$ $\text{Input}_2 \times W_2 = \underline{\hspace{1cm}}$	Sum of weighted Inputs 1 & 2 (columns F and G)	Activation > Threshold ? Is column H > 1.5 Write 0 for no or 1 for yes.	Desired Output 0 - no 1 - yes
0	0	N	Constraints on W_1 only make sense when Input ₁ is active (not 0)	1.5 - 0 = 1.5	1 (could be any value between 0.5 and 1.5)	$0 \times \underline{1} = \underline{0}$	$0 \times 1 = 0$	0	0	0
0	1	N				$0 \times \underline{1} = \underline{0}$	$1 \times 1 = 1$	1	0	0
1	0	N	<	$1.5 - \underline{0} = \underline{1.5}$		$\underline{1} \times \underline{1} = \underline{1}$	$0 \times 1 = 0$	1	0	0
1	1	Y	>	$1.5 - \underline{1} = \underline{0.5}$		$\underline{1} \times \underline{1} = \underline{1}$	$1 \times 1 = 1$	2	1	1
		B	C	D	E	F	G	H	I	★ A ★