Neuron Sandbox Expanded Worksheets

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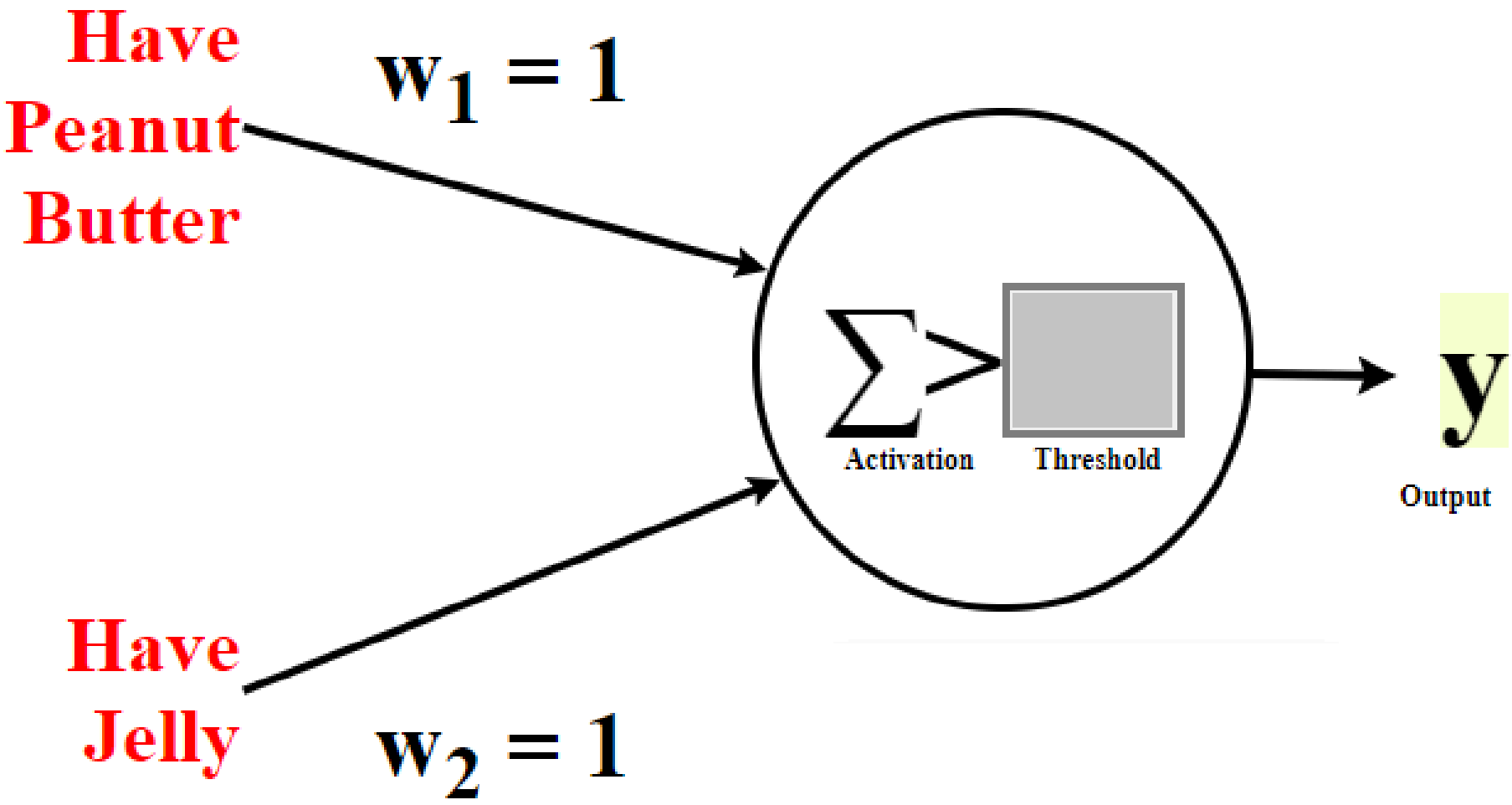
#1. Can I make a peanut butter and jelly sandwich? I need both peanut butter and jelly.

INPUTS		**Compute Weighted input 1:**	**Compute Weighted input 2:**	**ACTIVATION**	**Do we want the activation to be greater than the threshold?** *This answer should be based on the <u>desired output</u>.*	**Determine the threshold:** *What decimal number is greater than your Ns but less than your Ys?*	**Is activation greater than threshold?** *If the answer doesn't match the 1 or 0 in the <u>desired output</u>, change your threshold*	**DESIRED OUTPUT**
$Input_1$ Have peanut butter 0 - No 1 - Yes	$Input_2$ Have Jelly 0 - No 1 - Yes	$W_1 = 1$ $Input_1 \times W_1 =$ __	$W_2 = 1$ $Input_2 \times W_2 =$ __	Sum of weighted Inputs 1 & 2	(Y or N)	Threshold	Activation > Threshold ? Write 0 for no and 1 for yes.	0 - No 1 - Yes
0	0	__0__ x 1 = 0	__0__ x 1 = 0					
0	1	___ x 1 =___	___ x 1 = ___					
1	0							
1	1							
		B		**C**	**D**	**E**	**F**	**A**

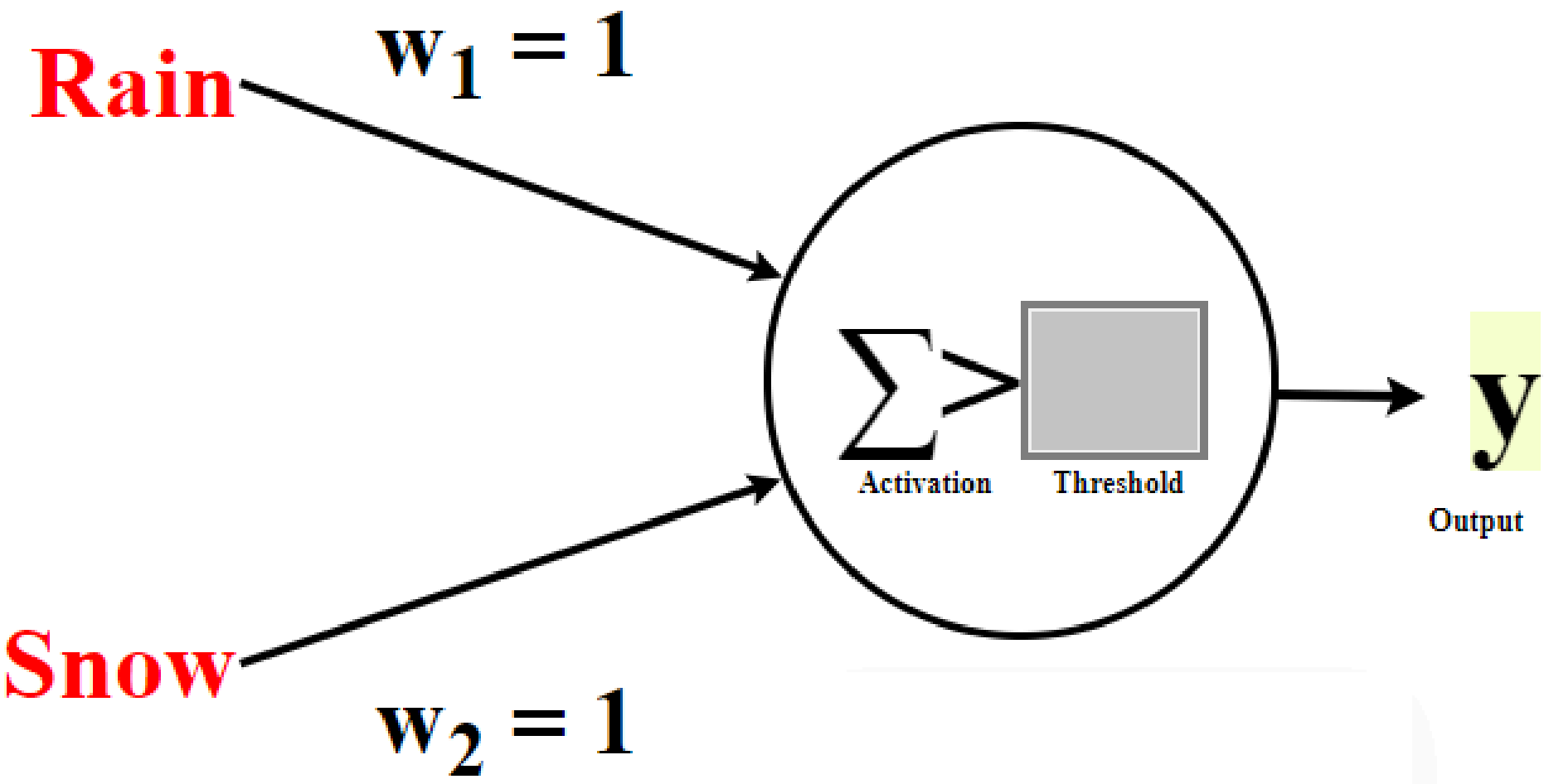
#1. Can I make a peanut butter and jelly sandwich? I need both peanut butter and jelly.



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

INPUTS		**Compute Weighted input 1:**	**Compute Weighted input 2:**	**ACTIVATION**	**Do we want the activation to be greater than the threshold?** *This answer should be based on the <u>desired output</u>.*	**Determine the threshold:** *What decimal number is greater than your Ns but less than your Ys?*	**Is activation greater than threshold?** *If the answer doesn't match the 1 or 0 in the <u>desired output</u>, change your threshold*	**DESIRED OUTPUT**
$Input_1$ Is it raining? 0 - No 1 - Yes	$Input_2$ Is it snowing? 0 - No 1 - Yes	$W_1 = 1$ $Input_1 \times W_1 =$ __	$W_2 = 1$ $Input_2 \times W_2 =$ __	Sum of weighted Inputs 1 & 2	(Y or N)	Threshold	Activation > Threshold ? Write 0 for no and 1 for yes.	0 - No 1 - Yes
0	0	__0__ x 1 = __	__0__ x 1 = __					
0	1	___ x 1 = __	___ x 1 = __					
1	0							
1	1							
		B		**C**	**D**	**E**	**F**	**A**

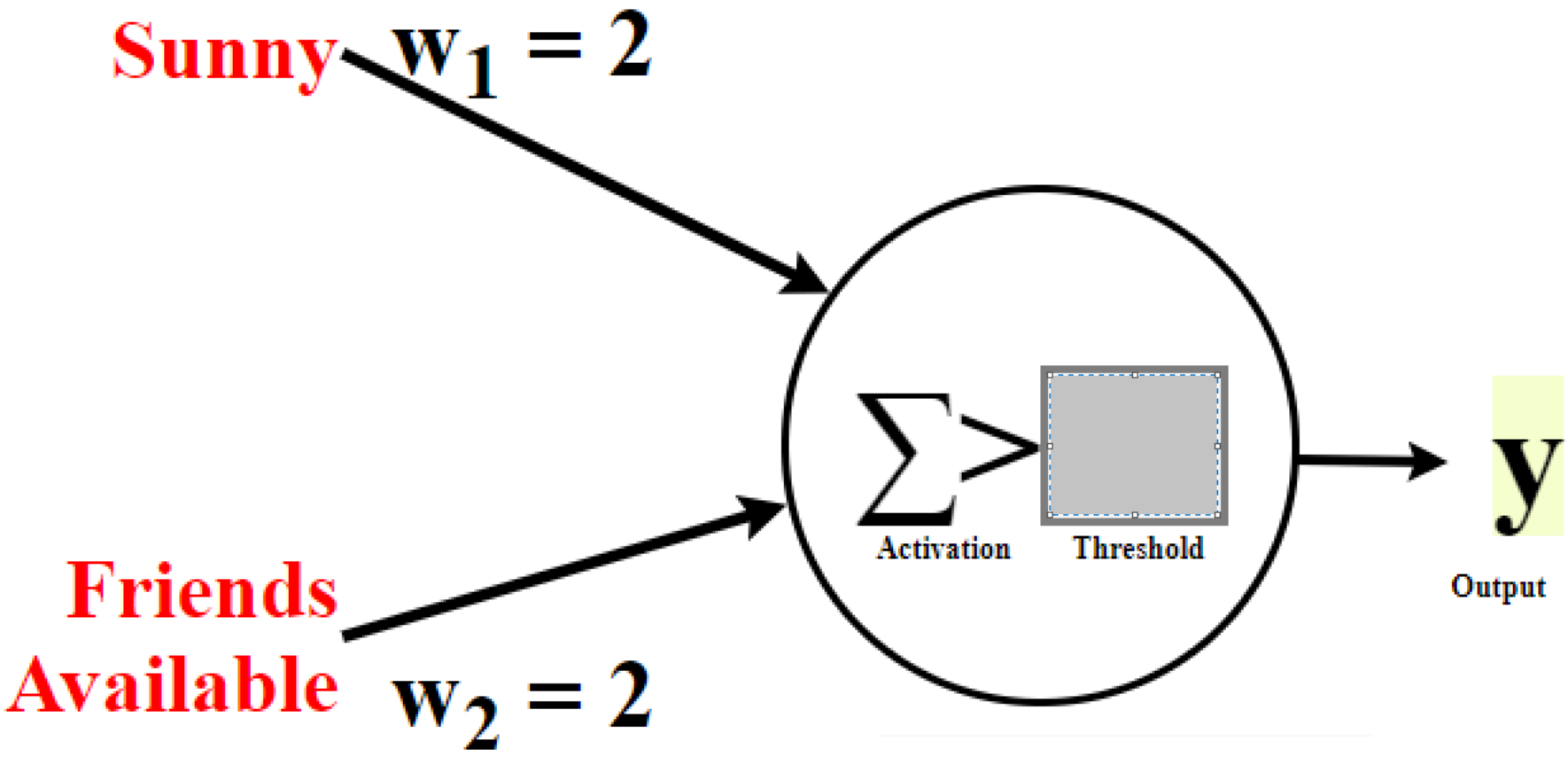
#2. Should I wear boots today? I should wear boots when it is raining or snowing.



#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		**Compute Weighted input 1:**	**Compute Weighted Input 2:**	**ACTIVATION**	**Do we want the activation to be greater than the threshold?** *This answer should be based on the <u>desired output</u>.*	**Determine the threshold:** *What decimal number is greater than your Ns but less than your Ys?*	**Is activation greater than threshold?** *If the answer doesn't match the 1 or 0 in the <u>desired output</u>, change your threshold*	**DESIRED OUTPUT**
$Input_1$ Is it sunny? 0 - No 1 - Yes	$Input_2$ Are friends available? 0 - No 1 - Yes	$W_1 = 2$ $Input_1 \times W_1 =$ __	$W_2 = 2$ $Input_2 \times W_2 =$ __	Sum of weighted Inputs 1 & 2	(Y or N)	Threshold	Activation > Threshold ? Write 0 for no and 1 for yes.	0 - No 1 - Yes
0	0	__0__ x 2 =	__0__ x 2 =					
0	1	___ x 2 =__	___ x 2 = __					
1	0							
1	1							
		B		**C**	**D**	**E**	**F**	**A**

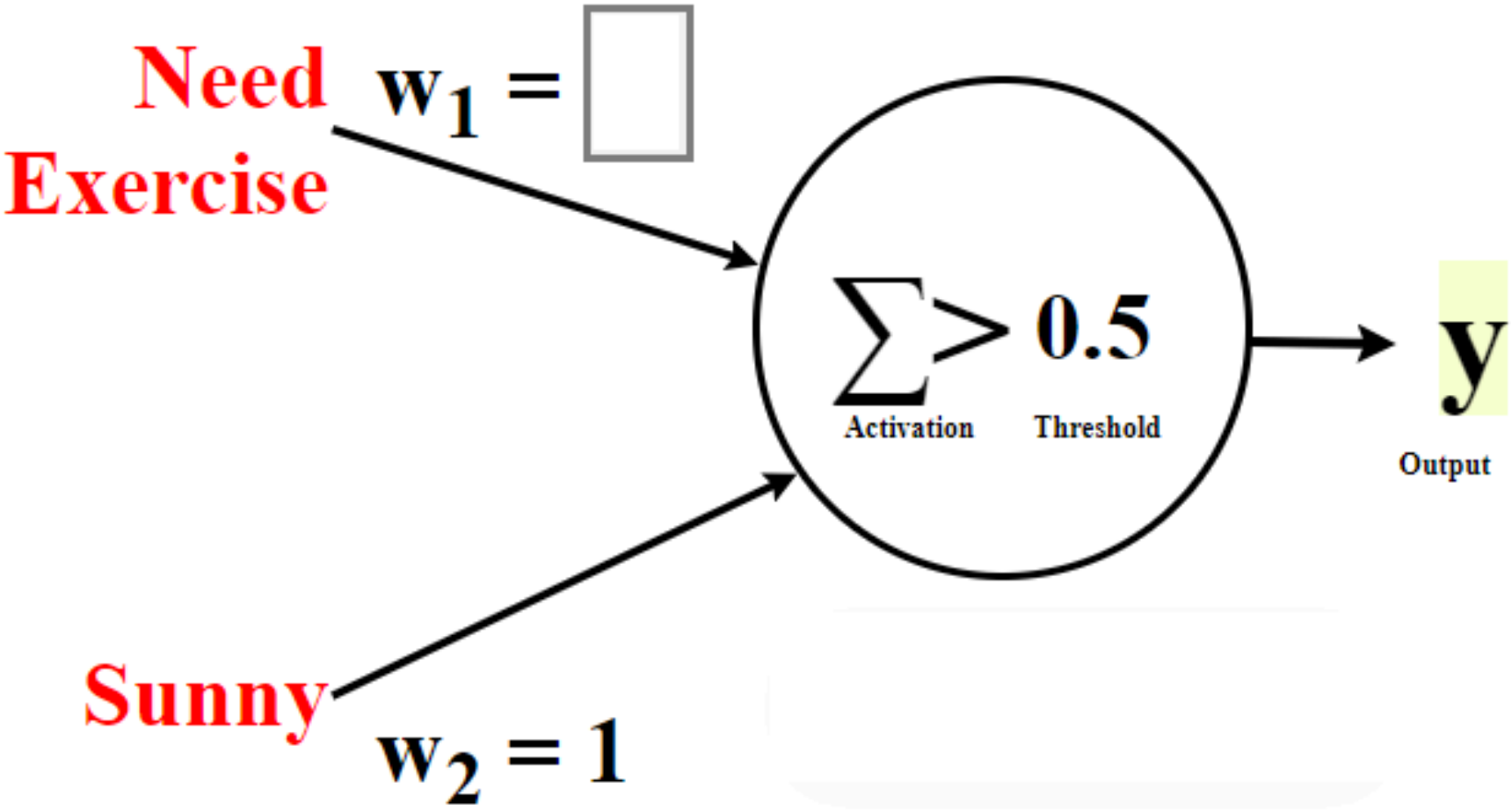
#3. John is planning a picnic with friends. He wonders if today is a good day for a picnic. It is a good day for a picnic if it is sunny outside and his friends are available today.



#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?** *Answer should be based on the <u>desired output</u> (column A)*	**Type of constraint on weight W_1** *Either "greater than" or "less than"*	**Margins for Weight W_1**	**Solution for Weight W_1** *What value for W_1 satisfies all constraints in columns C+D?*	**Compute Weighted input 1**	**Weighted input 2**	**ACTIVATION**	**Is activation greater than threshold?** *If the answer doesn't match the 1 or 0 in the <u>desired output</u>, go back to column E*	**DESIRED OUTPUT**
$Input_1$ 0 - Don't Need Exercise 1 - Need Exercise	$Input_2$ 0 - Not Sunny 1 - Sunny	(Y or N)	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 = ___ from E $Input_1$ x W_1= __	W_2 = 1 $Input_2$ x W_2= __	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.	0 - no 1 - yes
0	0		**Constraints on W_1 only make sense when $Input_1$ is active (not 0)**			<u>0</u> x __ = __	0 x 1 = **0**			
0	1					<u>0</u> x __ = __	1 x 1 = **1**			
1	0			0.5 - __= __		<u>1</u> x __ = __	0 x 1 = **0**			
1	1			0.5 - __ = __		<u>1</u> x __ = __	1 x 1 = **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:

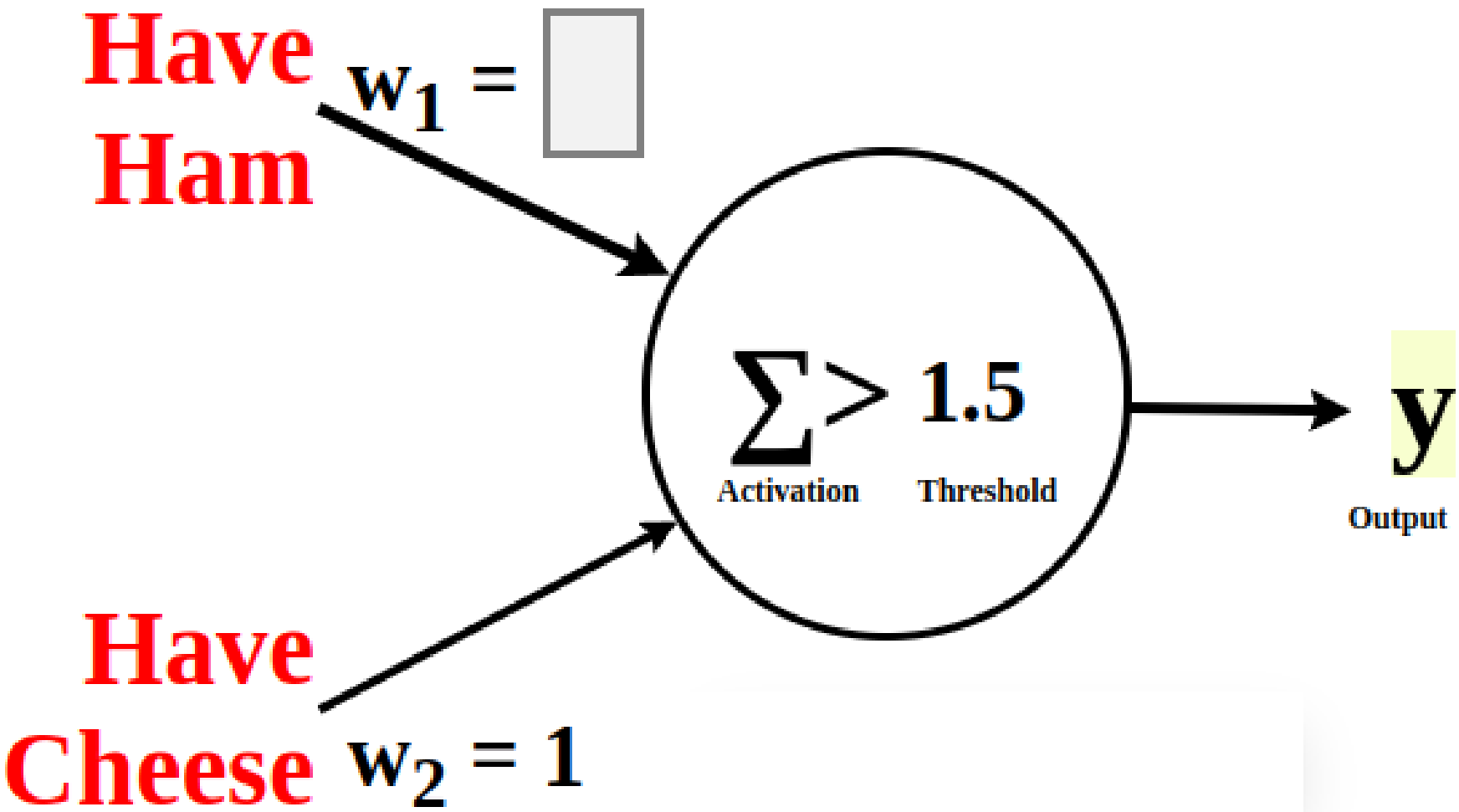
#4. Should I play outside? I would play outside either if I need exercise or if it's sunny.

INPUTS		Should activation be above threshold? *Answer should be based on the desired output (column A)*	Type of constraint on weight W_1 *Either "greater than" or "less than"*	Margins for Weight W_1	Solution for Weight W_1 *What value for W_1 satisfies all constraints in columns C+D?*	Compute Weighted input 1	Weighted input 2	Activation	Is activation greater than threshold? *If the answer doesn't match the 1 or 0 in the desired output, go back to column E*	Desired Output
$Input_1$ 0 - Don't Need Exercise 1 - Need Exercise	$Input_2$ 0 - Not Sunny 1 - Sunny	(Y or N)	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 = ___ from E $Input_1 \times W_1$= ___	W_2 = 1 $Input_2 \times W_2$= ___	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.	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 x 1 = 0	0 x 1 = **0**	0	0	0
0	1	Y				0 x 1 = 0	1 x 1 = **1**	1	1	1
1	0	Y	>	0.5 - 0 = 0.5		1 x 1 = 1	0 x 1 = **0**	1	1	1
1	1	Y	>	0.5 - 1 = -0.5		1 x 1 = 1	1 x 1 = **1**	2	1	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.

INPUTS		**Should activation be above threshold?** *Answer should be based on the <u>desired output</u> (column A)*	**Type of constraint on weight W_1** *Either "greater than" or "less than"*	**Margins for Weight W_1**	**Solution for Weight W_1** *What value for W_1 satisfies all constraints in columns C+D?*	**Compute Weighted input 1**	**Weighted input 2**	**Activation**	**Is activation greater than threshold?** *If the answer doesn't match the 1 or 0 in the <u>desired output</u>, go back to column E*	**Desired Output**
$Input_1$ 0 - Don't Have Ham 1 - Have Ham	$Input_2$ 0 - Don't Have Cheese 1 - Have Cheese	(Y or N)	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 = ___ from E $Input_1$ x W_1= __	W_2 = 1 $Input_2$ x W_2= __	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.	0 - no 1 - yes
0	0		**Constraints on W_1 only make sense when $Input_1$ is active (not 0)**			<u>0</u> x __ = __	0 x 1 = **0**			
0	1					<u>0</u> x __ = __	1 x 1 = **1**			
1	0			1.5 - __= __		<u>1</u> x __ = __	0 x 1 = **0**			
1	1			1.5 - __ = __		<u>1</u> x __ = __	1 x 1 = **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? *Answer should be based on the desired output (column A)*	Type of constraint on weight W_1 *Either "greater than" or "less than"*	Margins for Weight W_1	Solution for Weight W_1 *What value for W_1 satisfies all constraints in columns C+D?*	Compute Weighted input 1	Weighted input 2	Activation	Is activation greater than threshold? *If the answer doesn't match the 1 or 0 in the desired output, go back to column E*	Desired Output
$Input_1$ 0 - Don't Have Ham 1 - Have Ham	$Input_2$ 0 - Don't Have Cheese 1 - Have Cheese	(Y or N)	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 = ___ from E $Input_1 \times W_1$= ___	W_2 = 1 $Input_2 \times W_2$= ___	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.	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 between 0.5 and 1.5)	0 x 1 = 0	0 x 1 = **0**	0	0	0
0	1	N				0 x 1 = 0	1 x 1 = **1**	1	0	0
1	0	N	<	1.5 - 0 = 1.5		1 x 1 = 1	0 x 1 = **0**	1	0	0
1	1	Y	>	1.5 - 1 = 0.5		1 x 1 = 1	1 x 1 = **1**	2	1	1
		B	C	D	E	F	G	H	I	A