SMAI-M20-Lec 19 Review questions

IIIT Hyderabad

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Review Question - I (one, none or more correct)

1. Consider a two input (i.e., x_1 and x_2 neuron with an activation $\phi(z)$.
   Consider $\{-1, +1\}$ logic, and $\phi(z) = +1$ if $\mathbf{w}^T\mathbf{x} \geq 1$ else -1.
   For what values of w_1 and w_2, the neuron will act as AND?

   1.1 $w_1 = 1$ and $w_2 = 1$
   1.2 $w_1 = -1$ and $w_2 = -1$
   1.3 $w_1 = 2$ and $w_2 = 2$
   1.4 $w_1 = -2$ and $w_2 = -2$
   1.5 None of the Above

   Ans: AC In Q1,Q2,Q3, options A,C are AND gates and B,D are NOR gates

Review Question - II (one, none or more correct)

Consider a two input (i.e., x_1 and x_2 neuron with an activation $\phi(z)$.
Consider $\{-1, +1\}$ logic, and $\phi(z) = +1$ if $\mathbf{w}^T\mathbf{x} \geq 1$ else -1.
For what values of w_1 and w_2, the neuron will act as OR?

1. $w_1 = 1$ and $w_2 = 1$
2. $w_1 = -1$ and $w_2 = -1$
3. $w_1 = 2$ and $w_2 = 2$
4. $w_1 = -2$ and $w_2 = -2$
5. None of the Above

Ans: E

Review Question - III (one, none or more correct)

Consider a two input (i.e., x_1 and x_2 neuron with an activation $\phi(z)$.

Consider $\{-1, +1\}$ logic, and $\phi(z) = +1$ if $\mathbf{w}^T \mathbf{x} \geq 1$ else -1

For what values of w_1 and w_2, the neuron will act as NAND?

1. $w_1 = 1$ and $w_2 = 1$
2. $w_1 = -1$ and $w_2 = -1$
3. $w_1 = 2$ and $w_2 = 2$
4. $w_1 = -2$ and $w_2 = -2$
5. None of the Above

Ans: E

Review Question -IV (one, none or more correct)

Consider a two input (i.e., x_1 and x_2 neuron with an activation $\phi(z)$.

Consider $\{-1, +1\}$ logic, and $\phi(z) = +1$ if $\mathbf{w}^T \mathbf{x} \geq -1$ else -1

For what values of w_1 and w_2, the neuron will act as AND?

1. $w_1 = 1$ and $w_2 = 1$
2. $w_1 = -1$ and $w_2 = -1$
3. $w_1 = 2$ and $w_2 = 2$
4. $w_1 = -2$ and $w_2 = -2$
5. None of the Above

Ans: E In Q4, option A, C are OR gates and B,D are NAND gates

Review Question -V (one, none or more correct)

Consider a two input (i.e., x_1 and x_2 neuron with an activation $\phi(z)$.

Consider $\{0, +1\}$ logic, and $\phi(z) = +1$ if $\mathbf{w}^T \mathbf{x} \geq 1$ else 0

For what values of w_1 and w_2, the neuron will act as AND?

1. $w_1 = 1$ and $w_2 = 1$
2. $w_1 = -1$ and $w_2 = -1$
3. $w_1 = 2$ and $w_2 = 2$
4. $w_1 = -2$ and $w_2 = -2$
5. None of the Above

Ans: E In Q5 options A,C work as OR gates, options BD are always -1