SMAI-M20-Lec 18 Review questions

IIIT Hyderabad

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Review Question - 1 (one, none or more correct)

1. Consider the sigmoid function $g(z) = \frac{1}{1+e^{-z}}$
   1.1 when $z = 0$, $g(z) = 0.5$
   1.2 when z is negative, $g(z)$ is also negative.
   1.3 $g(z)$ is always in the range of $[0, 1]$
   1.4 $g(z)$ is always in the range of $[-1, 1]$

   Ans: AC

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

Consider the sigmoid function $g(\alpha, z) = \frac{1}{1+e^{-\alpha z}}$ where α is a positive real number.

1. if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z
2. if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \leq g(\alpha_2, z)$ for all z
3. if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z in the range $[-1, 1]$
4. if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z in the range $[1, 2]$
5. if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z in the range $[-2, -1]$

Ans: D g1(z) ¿ g2(z) for z¿0 and g1(z)¡g2(z) for z¡0

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

Consider the sigmoid function $g(z) = \frac{1}{1+e^{-z}}$ Then $g'(z)$ i.e., derivative of $g(z)$ with respect to z

1. is always positive for all values of z
2. is constant, i.e., derivative is independent of z.
3. $\frac{1}{1+e^z}$
4. $\frac{e^{-z}}{(1+e^{-z})^2}$
5. $g(z)(1 - g(z))$

Ans: ADE

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

Consider the sigmoid function $g(z) = \frac{1}{1+e^{-z}}$ Then $1 - g(z)$ is

1. is in the range of $[0, 1]$.
2. $\frac{1}{1+e^z}$
3. $\frac{e^{-z}}{1+e^{-z}}$
4. is in the range of $[-1, 0]$.
5. is in the range of $[-1, +1]$.

Ans: ACE notice that [0,1] is a subset of [-1,1]

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

You know the popular sigmoid function $g(z) = \frac{1}{1+e^{-z}}$, and also the $\tanh(z) = \frac{e^z - e^{-z}}{e^z + e^{-z}}$

1. $tanh(z)$ is in the range of $[0, 1]$
2. $tanh(z)$ is in the range of $[-1, +1]$
3. $tanh(z) = 2g(2z) - 1$
4. when $z = 0$, $tanh(z)$ is 0.
5. when $z = 0$, $tanh(z)$ is 0.5.

Ans: BCD