



 Dash

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Quiz

4 of 10 QUESTIONS

QUESTION 4

5 marks

Consider the recurrence equation

$$T(n) = 2T(n-1), \text{ if } n > 0$$
$$= 1, \text{ otherwise}$$

Then $T(n)$ is (in big O order)

○ $O(n)$

○ $O(2^n)$

○ ○(1)

- $O(\log n)$

Your submitted response was correct.

Explanation

Using Substitution Method: $T(n) = 2T(n-1)$ $T(n) = 2(2T(n-2)) = 2^2T(n-2)$ $T(n) = 2(2^2T(n-2)) = 2^3T(n-3)$ $T(n) = 2(2^3T(n-3)) = 2^4T(n-4)$ $T(n) = 2(2^4T(n-4)) = 2^5T(n-5)$ $T(n) = 2(2^5T(n-5)) = 2^6T(n-6)$ $T(n) = 2(2^6T(n-6)) = 2^7T(n-7)$ $T(n) = 2(2^7T(n-7)) = 2^8T(n-8)$ $T(n) = 2(2^8T(n-8)) = 2^9T(n-9)$ $T(n) = 2(2^9T(n-9)) = 2^{10}T(n-10)$ $T(n) = 2(2^{10}T(n-10)) = 2^{11}T(n-11)$ $T(n) = 2(2^{11}T(n-11)) = 2^{12}T(n-12)$ $T(n) = 2(2^{12}T(n-12)) = 2^{13}T(n-13)$ $T(n) = 2(2^{13}T(n-13)) = 2^{14}T(n-14)$ $T(n) = 2(2^{14}T(n-14)) = 2^{15}T(n-15)$ $T(n) = 2(2^{15}T(n-15)) = 2^{16}T(n-16)$ $T(n) = 2(2^{16}T(n-16)) = 2^{17}T(n-17)$ $T(n) = 2(2^{17}T(n-17)) = 2^{18}T(n-18)$ $T(n) = 2(2^{18}T(n-18)) = 2^{19}T(n-19)$ $T(n) = 2(2^{19}T(n-19)) = 2^{20}T(n-20)$ $T(n) = 2(2^{20}T(n-20)) = 2^{21}T(n-21)$ $T(n) = 2(2^{21}T(n-21)) = 2^{22}T(n-22)$ $T(n) = 2(2^{22}T(n-22)) = 2^{23}T(n-23)$ $T(n) = 2(2^{23}T(n-23)) = 2^{24}T(n-24)$ $T(n) = 2(2^{24}T(n-24)) = 2^{25}T(n-25)$ $T(n) = 2(2^{25}T(n-25)) = 2^{26}T(n-26)$ $T(n) = 2(2^{26}T(n-26)) = 2^{27}T(n-27)$ $T(n) = 2(2^{27}T(n-27)) = 2^{28}T(n-28)$ $T(n) = 2(2^{28}T(n-28)) = 2^{29}T(n-29)$ $T(n) = 2(2^{29}T(n-29)) = 2^{30}T(n-30)$ $T(n) = 2(2^{30}T(n-30)) = 2^{31}T(n-31)$ $T(n) = 2(2^{31}T(n-31)) = 2^{32}T(n-32)$ $T(n) = 2(2^{32}T(n-32)) = 2^{33}T(n-33)$ $T(n) = 2(2^{33}T(n-33)) = 2^{34}T(n-34)$ $T(n) = 2(2^{34}T(n-34)) = 2^{35}T(n-35)$ $T(n) = 2(2^{35}T(n-35)) = 2^{36}T(n-36)$ $T(n) = 2(2^{36}T(n-36)) = 2^{37}T(n-37)$ $T(n) = 2(2^{37}T(n-37)) = 2^{38}T(n-38)$ $T(n) = 2(2^{38}T(n-38)) = 2^{39}T(n-39)$ $T(n) = 2(2^{39}T(n-39)) = 2^{40}T(n-40)$ $T(n) = 2(2^{40}T(n-40)) = 2^{41}T(n-41)$ $T(n) = 2(2^{41}T(n-41)) = 2^{42}T(n-42)$ $T(n) = 2(2^{42}T(n-42)) = 2^{43}T(n-43)$ $T(n) = 2(2^{43}T(n-43)) = 2^{44}T(n-44)$ $T(n) = 2(2^{44}T(n-44)) = 2^{45}T(n-45)$ $T(n) = 2(2^{45}T(n-45)) = 2^{46}T(n-46)$ $T(n) = 2(2^{46}T(n-46)) = 2^{47}T(n-47)$ $T(n) = 2(2^{47}T(n-47)) = 2^{48}T(n-48)$ $T(n) = 2(2^{48}T(n-48)) = 2^{49}T(n-49)$ $T(n) = 2(2^{49}T(n-49)) = 2^{50}T(n-50)$ $T(n) = 2(2^{50}T(n-50)) = 2^{51}T(n-51)$ $T(n) = 2(2^{51}T(n-51)) = 2^{52}T(n-52)$ $T(n) = 2(2^{52}T(n-52)) = 2^{53}T(n-53)$ $T(n) = 2(2^{53}T(n-53)) = 2^{54}T(n-54)$ $T(n) = 2(2^{54}T(n-54)) = 2^{55}T(n-55)$ $T(n) = 2(2^{55}T(n-55)) = 2^{56}T(n-56)$ $T(n) = 2(2^{56}T(n-56)) = 2^{57}T(n-57)$ $T(n) = 2(2^{57}T(n-57)) = 2^{58}T(n-58)$ $T(n) = 2(2^{58}T(n-58)) = 2^{59}T(n-59)$ $T(n) = 2(2^{59}T(n-59)) = 2^{60}T(n-60)$ $T(n) = 2(2^{60}T(n-60)) = 2^{61}T(n-61)$ $T(n) = 2(2^{61}T(n-61)) = 2^{62}T(n-62)$ $T(n) = 2(2^{62}T(n-62)) = 2^{63}T(n-63)$ $T(n) = 2(2^{63}T(n-63)) = 2^{64}T(n-64)$ $T(n) = 2(2^{64}T(n-64)) = 2^{65}T(n-65)$ $T(n) = 2(2^{65}T(n-65)) = 2^{66}T(n-66)$ $T(n) = 2(2^{66}T(n-66)) = 2^{67}T(n-67)$ $T(n) = 2(2^{67}T(n-67)) = 2^{68}T(n-68)$ $T(n) = 2(2^{68}T(n-68)) = 2^{69}T(n-69)$ $T(n) = 2(2^{69}T(n-69)) = 2^{70}T(n-70)$ $T(n) = 2(2^{70}T(n-70)) = 2^{71}T(n-71)$ $T(n) = 2(2^{71}T(n-71)) = 2^{72}T(n-72)$ $T(n) = 2(2^{72}T(n-72)) = 2^{73}T(n-73)$ $T(n) = 2(2^{73}T(n-73)) = 2^{74}T(n-74)$ $T(n) = 2(2^{74}T(n-74)) = 2^{75}T(n-75)$ $T(n) = 2(2^{75}T(n-75)) = 2^{76}T(n-76)$ $T(n) = 2(2^{76}T(n-76)) = 2^{77}T(n-77)$ $T(n) = 2(2^{77}T(n-77)) = 2^{78}T(n-78)$ $T(n) = 2(2^{78}T(n-78)) = 2^{79}T(n-79)$ $T(n) = 2(2^{79}T(n-79)) = 2^{80}T(n-80)$ $T(n) = 2(2^{80}T(n-80)) = 2^{81}T(n-81)$ $T(n) = 2(2^{81}T(n-81)) = 2^{82}T(n-82)$ $T(n) = 2(2^{82}T(n-82)) = 2^{83}T(n-83)$ $T(n) = 2(2^{83}T(n-83)) = 2^{84}T(n-84)$ $T(n) = 2(2^{84}T(n-84)) = 2^{85}T(n-85)$ $T(n) = 2(2^{85}T(n-85)) = 2^{86}T(n-86)$ $T(n) = 2(2^{86}T(n-86)) = 2^{87}T(n-87)$ $T(n) = 2(2^{87}T(n-87)) = 2^{88}T(n-88)$ $T(n) = 2(2^{88}T(n-88)) = 2^{89}T(n-89)$ $T(n) = 2(2^{89}T(n-89)) = 2^{90}T(n-90)$ $T(n) = 2(2^{90}T(n-90)) = 2^{91}T(n-91)$ $T(n) = 2(2^{91}T(n-91)) = 2^{92}T(n-92)$ $T(n) = 2(2^{92}T(n-92)) = 2^{93}T(n-93)$ $T(n) = 2(2^{93}T(n-93)) = 2^{94}T(n-94)$ $T(n) = 2(2^{94}T(n-94)) = 2^{95}T(n-95)$ $T(n) = 2(2^{95}T(n-95)) = 2^{96}T(n-96)$ $T(n) = 2(2^{96}T(n-96)) = 2^{97}T(n-97)$ $T(n) = 2(2^{97}T(n-97)) = 2^{98}T(n-98)$ $T(n) = 2(2^{98}T(n-98)) = 2^{99}T(n-99)$ $T(n) = 2(2^{99}T(n-99)) = 2^{100}T(n-100)$ $T(n) = 2(2^{100}T(n-100)) = 2^{101}T(n-101)$ $T(n) = 2(2^{101}T(n-101)) = 2^{102}T(n-102)$ $T(n) = 2(2^{102}T(n-102)) = 2^{103}T(n-103)$ $T(n) = 2(2^{103}T(n-103)) = 2^{104}T(n-104)$ $T(n) = 2(2^{104}T(n-104)) = 2^{105}T(n-105)$ $T(n) = 2(2^{105}T(n-105)) = 2^{106}T(n-106)$ $T(n) = 2(2^{106}T(n-106)) = 2^{107}T(n-107)$ $T(n) = 2(2^{107}T(n-107)) = 2^{108}T(n-108)$ $T(n) = 2(2^{108}T(n-108)) = 2^{109}T(n-109)$ $T(n) = 2(2^{109}T(n-109)) = 2^{110}T(n-110)$ $T(n) = 2(2^{110}T(n-110)) = 2^{111}T(n-111)$ $T(n) = 2(2^{111}T(n-111)) = 2^{112}T(n-112)$ $T(n) = 2(2^{112}T(n-112)) = 2^{113}T(n-113)$ $T(n) = 2(2^{113}T(n-113)) = 2^{114}T(n-114)$ $T(n) = 2(2^{114}T(n-114)) = 2^{115}T(n-115)$ $T(n) = 2(2^{115}T(n-115)) = 2^{116}T(n-116)$ $T(n) = 2(2^{116}T(n-116)) = 2^{117}T(n-117$

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