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Exercises for
Embedded Systems
Wintersemester 19/20

Exercise Sheet 11 (Theory)

(11 Points)

Please note: Solutions must be submitted (individually or in pairs) until 10.01.2020 at 10:00 AM (mailbox in OH16, ground floor, in front of room E16). Submitting solutions via mail is *not* possible. Discussion: 13.-17.01.2020.

1 A/D Conversion (3 Points)

Please draw the schematic of a flash A/D converter for the case that 4 different voltage intervals are distinguished (2 points). Explain *shortly* how the converter works (1 point).

2 A/D Conversion (3 Points)

Please draw the schematic of a successive approximation converter with a resolution of 8 bit (2 points). Explain *shortly* how the converter works (1 point).

3 Aliasing (2 Points)

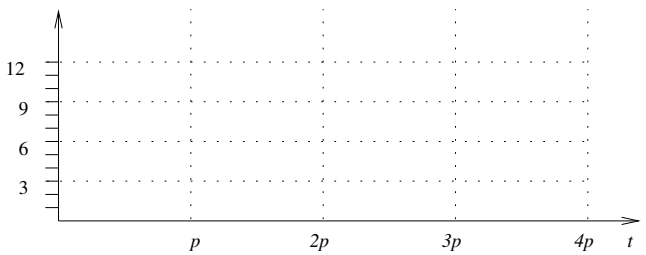
When sampling an input signal, aliasing may occur. What is aliasing (1 point)? How can aliasing be avoided (1 point)?

4 Real-Time Calculus (1 Point)

How are the maximum arrival curve $\alpha^u(\Delta)$ and the minimum arrival curve $\alpha^\ell(\Delta)$ defined?

5 Real-Time Calculus (2 Points)

Consider a stream of events, for which a burst of events occurs within a period p. In each period, 3 events arrive with distance d, starting from the begin of the period. How do the *arrival curves* for the *maximum* number of events within a time window Δ look like? Draw the curves in the interval $[0..4p]$ and indicate, which is the minimum and which is the maximum arrival curve (1 point per curve).



General information: Further information about the exercises, exercise sheets, and the exam admission can be found at
`https://ls12-www.cs.tu-dortmund.de/daes/de/lehre/lehrveranstaltungen/wintersemester-2019/es-1819.html.html`.