3.1 What is the difference between event-driven and multi-threading concurrency

When using the event-driven concurrency approach it can happen that one single handler can take a lot of time to complete/terminate, which can cause to a "traffic jam" for other requests will not be handled for a long time. In multi-threading concurrency this is not the case because other threads are handled independently from each other and requests will be handled regardless another request is taken a very long time to complete.
Furthermore event-driven concurrency has a very inexpensive memory cost, whereas the memory cost of multi-thread concurrency is much higher.

3.2 Low-Energy Earliest Deadline First

Task	Arrival Time [s]	Deadline [s]	Length [MI]
t1	0	4	900
t2	2	8	1800
t3	2.5	8	450
t4	5	20	1000
t5	6	14	800
Processor Speed [MIPS]		Voltage	
200		1.5	
300		2	
450		3.5	

$t_0 = 0:$

$$0 + \frac{900}{200} \not\leq 4 \;\Rightarrow\; \text{FALSE}$$

$$0 + \frac{900}{300} \leq 4 \;\Rightarrow\; t = 3 \Rightarrow t1 \textit{ scheduled on } 2V$$

$t_1 = 2:$

$$2 + \frac{300}{200} \leq 4 \Rightarrow\; t = 3.5 \Rightarrow \exists\tau_2 \textit{ with 1800 MI: } 3.5 + \frac{1800}{450} = 7.5 \leq 8 \Rightarrow t1 \textit{ scheduled on } 1.5V$$

$t_2 = 2.5:$

$$2.5 + \frac{200}{200} \leq 4 \Rightarrow\; t = 3.5 \Rightarrow \exists\tau_2 \textit{ with 1800 MI: } 3.5 + \frac{1800}{450} = 7.5 \leq 8 \Rightarrow \exists\tau_3 \textit{ with 450 MI: } 7.5 + \frac{450}{450} = 8.5 \not\leq 8 \Rightarrow \text{BREAK}$$

$$2.5 + \frac{200}{300} \leq 4 \Rightarrow\; t = 3.1\overline{6} \Rightarrow \exists\tau_2 \textit{ with 1800 MI: } 3.1\overline{6} + \frac{1800}{450} = 7.1\overline{6} \leq 8 \Rightarrow \exists\tau_3 \textit{ with 450 MI: } 7.1\overline{6} + \frac{450}{450} = 8.1\overline{6} \not\leq 8 \Rightarrow \text{BREAK}$$

$$2.5 + \frac{200}{450} \leq 4 \Rightarrow\; t = 2.9\overline{4} \Rightarrow \exists\tau_2 \textit{ with 1800 MI: } 2.9\overline{4} + \frac{1800}{450} = 6.9\overline{4} \leq 8 \Rightarrow \exists\tau_3 \textit{ with 450 MI: } 6.9\overline{4} + \frac{450}{450} = 7.9\overline{4} \leq 8 \Rightarrow \text{OK}$$

$t_3 = 5:$

$$7.9\overline{4} + \frac{1000}{450} \leq 20 \Rightarrow \text{OK}$$

$t_4 = 6:$

$$7.9\overline{4} + \frac{800}{450} = 9.7\overline{1} \leq 14 \Rightarrow 9.7\overline{1} + \frac{1000}{450} \leq 20 \Rightarrow \text{OK}$$

$t_6 = 7.9\overline{4}:$

$$7.9\overline{4} + \frac{800}{200} = 11.9\overline{4} \leq 14 \ \Rightarrow \exists \tau_5 \textit{ with 1000 MI: } 11.9\overline{4} + \frac{1000}{450} = 14.1\overline{6} \leq 20 \Rightarrow \text{OK}$$

$t_5 = 11.9\overline{4}:$

$$11.9\overline{4} + \frac{1000}{200} = 16.9\overline{4} \leq 20 \Rightarrow t5 \textit{ scheduled on } 1.5V$$

Therefore we get the execution plan:

Time[s]	Processor Speed [MIPS]	Voltage
0-2	300	2V
2-2.5	200	1.5V
2.5-7.9$\overline{4}$	450	3.5V
7.9$\overline{4}$-16.9$\overline{4}$	200	1.5V