**Exercice 1:** Réaliser un décompteur asynchrone Modulo M=6 < 23 (5 --> 0)

Table de vérité du décompteur M=6

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **N** | **Q2** | **Q1** | **Q0** | **R2** | **S2** | **R1** | **S1** | **R0** | **S0** |
| **5** | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **4** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **3** | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **1** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 1 | 1 | 1 | *0* | *1* | *1* | *0* | *0* | *1* |
| ~~6~~ | ~~1~~ | ~~1~~ | ~~0~~ | X | X | X | X | X | X |

Attention: Les entrées de forçage des bascules sont actives qu'avec un niveau haut (1).

R1=S2=S0=

R2=R0=S1=0

**Exercice 2:** Réaliser un compteur asynchrone Modulo M=10 < 24 (0 --> 9) (compteur à décade)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **N** | **Q3** | **Q2** | **Q1** | **Q0** | **R3** | **S3** | **R2** | **S2** | **R1** | **S1** | **R0** | **S0** |
| **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **1** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **3** | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **4** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **5** | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **6** | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **7** | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **8** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **9**  **Forçage** | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **10** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| **11** | 1 | 0 | 1 | 1 | X | X | X | X | X | X | X | X |
| **12** | 1 | 1 | 0 | 0 | X | X | X | X | X | X | X | X |

R0=R1=R2=R3=Q1.Q3

S0=S1=S2=S3=0

**Exercice 3:** Réaliser un décompteur asynchrone Modulo M=10 < 24 (9 --> 0)

Table de vérité du décompteur M=10

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **N** | **Q3** | **Q2** | **Q1** | **Q0** | **R3** | **S3** | **R2** | **S2** | **R1** | **S1** | **R0** | **S0** |
| **9** | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **8** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **7** | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **6** | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **5** | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **4** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **3** | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **1** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F | 1 | 1 | 1 | 1 | *1* | *0* | *0* | *1* | *0* | *1* | *1* | *0* |
| E | 1 | 1 | 1 | 0 | X | X | X | X | X | X | X | X |

**S3=R2=R1=S0=**

**R0=R3=S2=S1==1**

Attention: Les entrées de forçage des bascules sont actives qu'avec un niveau BAS (0).

R1=S2=S0=

R2=R0=S1=0