1. I connected all of the final states to a new start state, I turned the original start state into the new final state. Lastly I reversed every edge keeping all symbols the same.Diagram, schematic

Description automatically generated

2.DFAs used for product table

Diagram

Description automatically generated

Product Table

|  |  |  |
| --- | --- | --- |
| State | a | b |
| {r0,s0} | {r1,s1} | {jail,s1} |
| {r1,s1} | {r2,s2} | {jail,s2} |
| {jail,s1} | {jail,s2} | {jail,s2} |
| +{r2,s2} | {jail,s3} | {r2,s3} |
| {jail,s2} | {jail,s3} | {jail,s3} |
| +{jail,s3} | {jail,s1} | {jail,s1} |
| +{r2,s3} | {jail,s1} | {r2,s1} |
| +{r2,s1} | {jail,s2} | {r2,s2} |

3. All states that are accepting states from R or S or both  
{r2,s2}  
{jail,s3}  
{r2,s3}  
{r2,s2}

4. All states that are accepting states in both R and S (&&)  
{r2,s3}

5. All states that are accepting states R but not in S  
{jail,s3}

6. All states that are accepting states in S but not R  
{r2,s2}  
{r1,s1}

7. All states that are in either S or R but not both (Xor)  
{r2,s2}  
{r1,s1}  
{jail,s3}