

### Encryption:

In the AES Encryption, I first put all the supported functions into a single file and arrange the order. Then, I create the function for substitution, shift rows, mix columns, and add round key. Then, in the main encrypted function, I first find the correct round key, create the state array. Then, I xor the state array and the first round key before the loop. Then I create a loop to go through 14 rounds. In the loop we do the operation with the order of substitution, shift rows, mix columns, and add round key. However, we should not mix columns for the last round. Finally, we write our output in hex.

### Decryption:

In the AES Decryption, I did similar thing, but only reverse the order of the round key and change the order of the function to inverse shift rows, inverse substitution, add columns, and add round keys. Finally, we write our output in text.

### Encryption output:

```
2bd280a572d58f866b407a63e2ac60a4a58e4f16d71808c75b85a3188aa78de704538
83720af225915d84feff6fc415edfd642d338f4d61f1d8b696e47a0e2f3769c340a5d249
ebaae0fd1817f6db4166b2b9e32c7a9c93dcf801f52946997ba0f0584ee0b118e3335a
5efabf959e799736ec47b6df311c0f05ede6c2ae6a130d33722616b931f1982d9039f76
09f77d734d54b495016d43c5e22e7f9d4b7f9d3fbf031faf35f93de2178d6b7b1281db8
8be2c3708441843af5ab489dabde7ddefd3407c4b895fa18bb803259e4c2925360176
82376f140070dec722414b5c971b144be144ccbd55169ca58c8785393ab6023ca02c6
2e3184dacc3598ed9027a9ef4debd3dbf04b953eabee5ee753046c695ff58206fabcc29
e59d4917ceddc0f791dd3790be6a55dad78c25fb35924c9e3ab50e50fd268ab9c20338
a4098aacfb3053534ac9737828be7a615b609196ec23cf880fa1ae2407ba15a4c4c305f
612181320100e5b87649e4eb9565c83e1d0898312461e38d63c8452e38abe8099c4c
b17964a0d4dd3bbde0ec018d37c2aaa9fe33e1f69a9d886a7c3fa0f03554965f572d90
506bb3c07fc8d8af0d0f10ce1b6eef25f64e4c0a0d8ece2958b860a3c14e84993511caa
d9e5f5611f7516d82d89e5680cb8a248b5c3a686d26164c98dc9dd4f8336390afda650
3b79dce3e9e561b0f006bf32a7071e16fd7e7da6a72a884afce43f42a61c85926a17056
f54084f6355fbe34d6d05eb6cedef0864b8
```

### Decryption output:

As a constructor in Formula One, Ferari has a record 16 Constructors' Championships. Their most recent Constructors' Championships was won in 2008. The Team also holds the record for the most Drivers' Championships with 15, won by nine different drivers: Alberto Ascari, Juan Manuel Fangio, Mike Hawthorn, Phil Hill, John Surtees,

Niki Lauda, Jody Scheckter, Michael Sschumacher and Kimi Raikkonen. Raikkonen's title in 2007 is the most recent for the team. The 2020 Tuscan Grand Prix marked Ferrari's 1000th Grand Prix in Formula One.