For problem 1, we need to write a script using DES algorithm in both encryption and decryption. Page 21 from lecture note 3 shows us the structure of how DES works. So, I combined and clean the unnecessary code from the giving files into my DES script. After reading the code, we could find out that, we need to write our own code after the step of the first xor. As a result, I did the application of substitution and permutation. After that, I xor the result and LE to find out our RE. We needed to repeat this process 16 rounds to get our final encrypted code (from lecture note page 13). For decryption, I basically did the similar process, but with reversed round key. Since the input now is a very long hex, we need to divide it into several part with length of 64. So, we can read and divide properly. After running through the whole process, I changed the result back into ascii form.

The result for encryption:
36d2e582921b6b4a4729ec8a60a4915ba76f3fec1c010014c13444b4afbefb12474358
2e779a57cf992d871fcd7e178fe0c5b2c8ccc1a78fcae1aab4c09dd92388d20af1deaf36
212e9fad48d6cf32d8299cf7bfe82e8faa32b3383d1877fb86eb489571936cdcda5d32f
1bc9a359bd63f411305859fec912107c147cb77b2f459f944561933e2ca54416929a35
c2ce30438568de299dac4a33811a43d6b1e6ec75f86e0768b8ff5eea71a6bb8907125a
17a19997c153b4665123bf24bfe084f129a72292fe22fadf0ab59a06babc93f9aecc8254
5e35920fa68a6eea18322458bf5a0fe9e50695326cb0ff211484b883a677b20a331858
4f058b818fa594e9bb2744c67a5ba2ad2d65e39d4522476efa8770e1bf5547cc90f12f7
3ec93102586e55c8a8e6bdeb8e16205040647bbcb8be20b29d589da8c3fa2a9ec2f00
dc056046c299bbb1532ef8c38b24c021558175055c4a95a1b193deec41112afa5db015
fbac30c6c95c83e3cb07f9b28c849b0330d4b4e84abf996f91ae58a499a44b87340c11c
a00748b00072d7bf22bb383f3f2e2aa185921e974e23fc695bab5c2ddd27d5fa0e6e6d
e2af262f2608fa8cbc25bfbdc4f5f8f0f785a1b4d4c63fa94f0c16601d8cff74856ca0a1ca
8e1167db0a5a55e7dbb246202ae59835c16e90c1e0c5b2c8ccc1a78f726e8963d971b
aba5db79b6739f3fa4329acdfef24b1b13d361832c5bd814d7acf7059e1b251f74e6041
16ecb90755cc43a12639c01917653cd945c9065737efa9401947fb9557568b567bdf05
9a474f95217f55ba63b3ed666854c2dda688b6acf0722076e3fd18d59b9109d4639c5a
10dcc9dd17a3e78fe956fb9687276ad8aefbfa2764ab669e7444e751fc396940fee2446
b2e40d29f277a46ab9781445b25725cd74215a01694f2566b33456851c5966303a205
3f6a22d41581fa810f1668eb7761db9206b466a8a65e50171f030c680a971cffd17e583
060cd6e32ec5bd4ba1f9bda5976a883327bada116974b7e8220290949d5315cd4d308
e297b7789bcf7466c433e6effef150ea4a44df492f449509044104c47b32351b272672f
c599ea6926482920a08dd08cfdfdd19ae50585efebe84f51afbd7487e04b5e127457e3
7e615da2b55fafc317fecebf59a

The result for decryption:
In the unforgiving world of Formula One, Lewis Hamilton abides at the top. He's the man to beat, the top earner, the most important voice, the most prominent figure - a Black man alone at the summit of motorsports' highest echelon. England's knight in Mercedes armor. Over the past 15 years, the 36-year-old Briton has won seven world championships, tying the record set by Ferrari's Michael Schumacher - the German F1 driver who was regarded as the greatest of all time until Hamilton broadsided him from that perch. At Sunday's Russian Grand Prix, Hamilton rallied through a late rain shower to claim the checkered flag on the way to becoming the first driver in the sport's history with 100 career victories. And that's besides his 100 career pole positions. As achievements go in racing, this is beyond otherworldly.

For problem 2, we need to encrypt the ppm image. This is basically the similar process as encryption for text. However, we need to read off the first 3 lines of the input in rb mode. And, we combine those lines with the output after encryption.

The output for problem 2: