Given file ElGamal.py

Encryption function mathematically gives

$$t = (h^k \times m) \, modulo \, p$$
$$r = (g^k) \, modulo \, p$$

Decryption function mathematically gives

$$m = (r^{q-s} \times t) \, modulo \, p$$

But using given encryption function we can create our on decryption

$$m = ((h^k)^{-1} \times t) \, modulo \, p$$

Thus we need to find k, where $1 < k < 2^{16} - 1$ as given in encryption function and we are already given $r = (g^k) \, modulo \, p$, so we iterate over powers of g and find the k.

Then for k such that $r = (g^k) \, modulo \, p$;
We calculate the following: h^k
Take inverse of h^k over $modulo \, p$ which is $(h^k)^{-1}$
And finally using the function $m = ((h^k)^{-1} \times t) \, modulo \, p$ gives us the message m.