CPA-ENCRYPTION FUNCTIONS:

1. GEN-

`Function to generate key`

Parameters	Datatype	Description
p	int	prime of group Z_p^*. Our valid set of keys will lie between (0, p-2) as the generator can have powers between this range

Return:

`binary format of chosen key`

Called by:

- `ENC`

Caller of:

`None`

2. ENC-

`Function to encrypt plaintext`

Parameters	Datatype	Description
msg	str	Plaintext
g	int	Generator
p	int	Prime
key	str	Randomly chosen key
BLK_SIZE	int	Size of each msg block

Return:

```
(str): random noise used for probabilistic encryption
(str): cipher text generated
```

Called by:

- `CCA_ENC`

Caller of:

- `msgToBinary`
- `GEN`
- `decimalToBinary`
- `binaryToDecimal`
- `PRF`

3. DEC-

`Function to decrypt ciphertext`

Parameters	Datatype	Description
counter	str	Random noise
cipher	str	Cipher text
key	str	Randomly chosen key
g	int	Generator
p	int	Prime
BLK_SIZE	int	Size of each msg block

Return:
`(str): decoded plaintext`

Called by:

- `CCAAuthDec`

Caller of:

- `decimalToBinary`
- `binaryToDecimal`
- `PRF`
- `binaryToMsg`