

# CPA-secure encryption

- Let  $F$  be a keyed function
- $\text{Gen}(1^n)$ : choose a uniform key  $k \in \{0, 1\}^n$
- $\text{Enc}_k(m)$ , for  $|m| = |k|$ :
  - Choose uniform  $r \in \{0, 1\}^n$
  - Output ciphertext  $\langle r, F_k(r) \oplus m \rangle$
- $\text{Dec}_k(\langle c_1, c_2 \rangle)$ : output  $c_2 \oplus F_k(c_1)$

# 과제

$n(\text{key size}) = 128$   
 $m = \text{"CPA-secure"}$

주어진 CPA 시작코드에서 `Gen`, `Enc`, `Dec` 함수 완성하기  
(다른 부분은 수정할 필요 없음)

출력 예:

```
r      : 3C468577F727AC2360F26F4AFBFDB945
Fkr    : CB24C3D9F6AE51A75F2C9E7AE276C08B
Fkc    : CB24C3D9F6AE51A75F2C9E7AE276C08B
C1     : 3C468577F727AC2360F26F4AFBFDB945
C2     : CB24C3D9F6AE12F71E01ED1F8103B2EE
Dec    : CPA-secure
```

※Dec을 제외한 나머지 값은 실행시마다 달라짐