

作業一：資訊隱藏

學號：C24106082

姓名：陳宏彰

2022-09-13

1 原理

1.1 藏入

輸入 secret 和 carriers，secret 指要隱藏的字串，只能包含 ASCII，carriers 是一串用空白分隔的字串。

1. 將 secret 按照 ascii code 和 spaceMap 編碼成兩個空白，獲得一串空白字元 secretSpace.
2. 將 carriers 用空白切成一串 []string，稱為 carrierList
3. 依序將一個 carrier、一個空白串起來，直到 secretSpace 用完，在結尾在插入最後一個 carrier，如果 carrier 不夠用，則從頭開始

1.2 取出

取出所有空白字元，根據 spaceMap 解碼，就獲得原本的 secret 了

2 使用範例

2.1 隱藏

```
$ go run . hide > t
Enter what you want to hide, only ascii availabe: ncku information se
Enter the carrier text: this is a message that may repeat many times
```

2.2 取出

```
$ cat t | go run . extract  
ncku information security%
```

2.3 t 內容

```
0000: 7468 6973 e280 8469 73e2 819f 61e2 8084 this...is...a...  
0010: 6d65 7373 6167 65e2 8081 7468 6174 e280 message...that..  
0020: 846d 6179 e280 8972 6570 6561 74e2 8085 .may...repeat...  
0030: 6d61 6e79 e280 8374 696d 6573 e280 8074 many...times...t  
0040: 6869 7320 6973 e280 8461 e280 876d 6573 his is...a...mes  
0050: 7361 6765 e280 8474 6861 74e2 819f 6d61 sage...that...ma  
0060: 79e2 8084 7265 7065 6174 e280 846d 616e y...repeat...man  
0070: 79e2 8084 7469 6d65 73e3 8080 7468 6973 y...times...this  
0080: e280 8569 73e2 8080 61e2 8084 6d65 7373 ...is...a...mess  
0090: 6167 65e2 80af 7468 6174 e280 846d 6179 age...that...may  
00a0: c2a0 7265 7065 6174 e280 856d 616e 79e2 ..repeat...many.  
00b0: 8082 7469 6d65 73e2 8084 7468 6973 e280 ..times...this..  
00c0: 8769 73e2 8084 61e3 8080 6d65 7373 6167 .is...a...messag  
00d0: 65e2 8084 7468 6174 e281 9f6d 6179 e280 e...that...may..  
00e0: 8072 6570 6561 7420 6d61 6e79 e280 8574 .repeat many...t  
00f0: 696d 6573 e280 8174 6869 73e2 8084 6973 imes...this...is  
0100: e280 8361 e280 846d 6573 7361 6765 e280 ...a...message..  
0110: 8174 6861 74e2 8085 6d61 79e2 8083 7265 .that...may...re  
0120: 7065 6174 e280 856d 616e 79e2 8080 7469 peat...many...ti  
0130: 6d65 73e2 8084 7468 6973 e280 8769 73e2 mes...this...is..  
0140: 8085 61e2 8082 6d65 7373 6167 65e2 8085 ..a...message...  
0150: 7468 6174 e280 876d 6179 0a that...may.
```

this is a message that may repeat many times this is a message that
may repeat many times this is a message that may repeat many times
this is a message that may repeat many times this is a message
that may repeat many times this is a message that may

3 程式碼

完整程式碼在 <https://github.com/simbafs/NCKU-IS-HW1>，以下僅
擷取部份

3.1 隱藏

```
// input
// secret
reader := bufio.NewReader(os.Stdin)
fmt.Fprintf(os.Stderr,
"Enter what you want to hide, only ascii availabe: ")
secret, err := reader.ReadString('\n')
if err != nil {
    fmt.Fprintf(os.Stderr, "error: %v\n", err)
    return
}
// carrier
secret = strings.TrimRight(secret, "\n")
fmt.Fprintf(os.Stderr, "Enter the carrier text: ")
carrier, err := reader.ReadString('\n')
if err != nil {
    fmt.Fprintf(os.Stderr, "error: %v\n", err)
    return
}
carrier = strings.TrimRight(carrier, "\n")
// split and remove space
carrierListN := strings.Split(carrier, " ")
carrierList := []string{}
index := 0 // index to carrierList
getCarrier := func() string {
    s := carrierList[index]
    index = (index + 1) % len(carrierList)
    return s
}
for _, s := range carrierListN {
    if s != "" {
        carrierList = append(carrierList,
strings.Trim(s, " "))
    }
}
// hide
for _, c := range []rune(secret) {
    if c > unicode.MaxASCII {
        fmt.Fprintf(os.Stderr,
"error: only ascii availabe\n")
    }
}
```

```

        return
    }
    firstSpace := SpaceMap[c/16]
    secondSpace := SpaceMap[c%16]
    fmt.Printf("%s%c%s%c",
        getCarrier(), firstSpace, getCarrier(), secondSpace)
}
fmt.Printf("%s\n", getCarrier())

```

3.2 取出

```

reader := bufio.NewReader(os.Stdin)
text, err := reader.ReadString('\n')
if err != nil {
    fmt.Fprintf(os.Stderr, "error: %v\n", err)
    return
}
isFirst := true
char := '\000'
for _, c := range []rune(text) {
    if index, ok := spaceMapReverse[c]; ok {
        if isFirst {
            char = rune(index * 16)
            isFirst = false
        } else {
            char += rune(index)
            fmt.Printf("%c", char)
            isFirst = true
        }
    }
}
}

```