

## 프로그래밍 실습 1

```
from __future__ import print_function
from sys import stdin

def printf(str, *args):
    print(str % args, end='')

domain = 5

def readfile(fn, adjacency):
    adjacencymx = [[0 for j in range(len(adjacency[0]))] for i in range(len(adjacency))]
    fp = open(fn, 'r')
    printf("입력 받은 관계 R 출력입니다.\n")
    print("R = {")

    lines = fp.readlines()
    for line in lines:
        values = line.strip('\n').split()
        x = int(values[0])
        y = int(values[1])

        adjacencymx[x][y] = 1
        printf("(%2d, %2d)  %(x,y))

    fp.close()
    return adjacencymx

# allocate initial value
adjacencymx = [[0 for j in range(domain+1)] for i in range(domain+1)]
fn = "pp4-1.dat"

adjacencymx = readfile(fn,adjacencymx)
printf("\n\n")

printf("%5cdegree of vertex\n\n"%' ')

for i in range(1, domain + 1):
    degree = 0
    for j in range(1, domain + 1):
        if adjacencymx[i][j] == 1:
            degree += 1
    printf("%9cv(%3d)=%4d\n" %(' ',i,degree))
printf("\n\n%5cadjacency matrix\n\n"%' ')

for i in range(1, domain + 1):
    printf("%5c"%' ')
    for j in range(1, domain + 1):
        if adjacencymx[i][j] == 1:
            printf("1 ")
        else:
            printf("0 ")
    printf("\n")

stdin.readline()
```

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PP4-1.DAT

1 2  
1 4  
2 2  
2 4  
3 1  
3 2  
3 3  
3 4  
3 5  
4 1  
4 3  
5 1  
5 3  
5 5

## 프로그래밍 실습 2

```
# python에서의 구현 상의 이슈로 C 언어 코드 상의 getch()는 stdin.readline()으로 대체함
from __future__ import print_function
from sys import stdin

def printf(str, *args):
    print(str % args, end='')

maxvalue = 5    # maxvalue는 정점의 개수
n = 6          # n은 입력개수

b = [[0 for j in range(3)] for i in range(n+1)]
a = [[0 for j in range(maxvalue+1)] for i in range(maxvalue+1)]

order = [0 for i in range(maxvalue+1)]
deg = [0 for i in range(maxvalue+1)]
col = [0 for i in range(maxvalue+1)]

printf("정점은 5개를 가진 그래프입니다\n")
printf("관계를 1 2와 같은 순서쌍으로 6개 입력하시오\n")
for i in range(1, n+1):
    values = stdin.readline().strip('\n').split()
    b[i][1] = int(values[0])
    b[i][2] = int(values[1])
    a[b[i][1]][b[i][2]] = 1
    a[b[i][2]][b[i][1]] = 1

printf("%5c-----\n"%' ')
printf("%5cdegree matrix\n"%' ')
for i in range(1,n+1):
    printf("%5c(%2d,%2d)\n"%' ',b[i][1],b[i][2]))
printf("%5c-----\n"%' ')
stdin.readline()

for i in range(1, maxvalue+1):
    for j in range(1, maxvalue+1):
        if a[i][j] != 0:
            deg[i] = deg[i] + 1

printf("\n%5cdegree of vertex\n\n"%' ')

for i in range(1, maxvalue+1):
    printf("%5cdeg[%d] = %d\n"%' ',i,deg[i]))
printf("%5c-----\n"%' ');
stdin.readline()

for i in range(1, maxvalue+1):
    order[i] = i

for i in range(1, maxvalue):
    for j in range(i+1, maxvalue+1):
        if deg[order[i]] < deg[order[j]]:
            temp = order[i]
            order[i] = order[j]
            order[j] = temp
```

```

c = 1
cnt = 0
for k in range(1, maxvalue+1):
    if col[order[k]] == 0:
        for i in range(1,maxvalue+1):
            if a[order[k]][i] == 0 and col[i] == 0:
                col[i] = c
                cnt += 1

        if cnt == maxvalue:
            break
        else:
            c += 1

printf("\n%5cvertex coloring\n\n",' ')
for i in range(1, maxvalue+1):
    printf("%5ccolor(v%d)=%d\n",' ',i,col[i])
printf("%5c-----\n",' ')
for i in range(1, maxvalue):
    if col[i] > col[i+1]:
        col[i+1] = col[i]
printf("이 그래프는  %d색 가능하다.\n",col[i]);

stdin.readline()

```