<이산수학>_8장_프로그래밍 실습_파이썬 코드

프로그래밍 실습 1

```python
from __future__ import print_function
from sys import stdin

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

MAX_VERTICES = 8
MAX_EDGES = 12
INF = 1000

class Dist:
        def __init__(self):
                self.dist = [0 for i in range(MAX_VERTICES)]
                self.edge = [['' for j in range(2)] for i in range(MAX_VERTICES)]

weight = [[0 for j in range(MAX_VERTICES)] for i in range(MAX_VERTICES)]

selected = [False for j in range(MAX_VERTICES)]
dists = Dist()

def get_min_vertex(n):
        v = -1
        for i in range(0, n):
                if not selected[i]:
                        v = i
                        break

        for i in range(0, n):
                if (not selected[i]) and (dists.dist[i] < dists.dist[v]):
                        v = i
        return v

def prim(s, n):
        for u in range(0, n):
                dists.dist[u] = INF
                selected[u] = False
        dists.dist[s] = 0

        for i in range(0, n):
                u=get_min_vertex(n)
                selected[u] = True
                if dists.dist[u] == INF:
                        return
                if u != s:
                        printf("(%c, %c) "%(dists.edge[u][0],dists.edge[u][1]))

                for v in range(0, n):
                        if weight[u][v] != INF:
                                if (not selected[v]) and (weight[u][v] < dists.dist[v]):
                                        dists.dist[v] = weight[u][v]
                                        dists.edge[v][0] = chr(65+u)
                                        dists.edge[v][1] = chr(65+v)
```

```
for i in range(0, MAX_VERTICES):
        for j in range(0, MAX_VERTICES):
                if i==j:
                        weight[i][j] = 0
                else:
                        weight[i][j] = INF
printf("정점의 개수와 간선의 개수를 그래프에 맞게 변경하셨나요\n")
printf("정점_1 정점_2 가중치를 다음 형태대로 입력하세요\n")
printf("예제) a b 10\n\n")
list = []
for i in range(0, MAX_EDGES):
        list += stdin.readline().strip('\n').split()
        u_temp = ord(list.pop(0))
        v_temp = ord(list.pop(0))
        temp = int(list.pop(0))

        u = u_temp - 97;
        v = v_temp - 97;
        weight[u][v] = temp;
        weight[v][u] = temp;

prim(0,MAX_VERTICES)

stdin.readline()
```

프로그래밍 실습 2

```python
from __future__ import print_function
from sys import stdin

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

class Node:
        def __init__(self):
                self.left = None
                self.data = 0
                self.right = None

def preorder(p):
        if p != None:
                printf("%3d")%p.data)
                preorder(p.left)
                preorder(p.right)
        return 0

def inorder(p):
        if p != None:
                inorder(p.left)
                printf("%3d")%p.data)
                inorder(p.right)
        return 0

def postorder(p):
        if p != None:
                postorder(p.left)
                postorder(p.right)
                printf("%3d")%p.data)
        return 0

def insert(x, p):
        if p == None:
                p = Node()
                p.data = x
        elif x < p.data:
                p.left = insert(x, p.left)
        else:
                p.right = insert(x, p.right)
        return p

prn = None
printf("\n### Select number ###\n")
printf("1. 전위 탐방(preorder)                    search\n")
printf("2. 중위 탐방(inorder)                     search\n")
printf("3. 후위 탐방(postorder)           search\n")
printf("4. insert\n")
printf("5. ######## end ########\n")
printf("먼저 4번을 선택해서 이진 트리를 만들고 그 이진 트리에서 탐방 하세요.\n")
printf("4번의 입력 형태는 4 5와 같은 형태로 계속 같은 방법을 이용해서 이진 트리를 만드세요.\n")
```

```python
while True:
        values = stdin.readline().strip('\n').split()
        if len(values) > 0:
                ch = int(values[0])
                if ch == 1:
                        preorder(prn)
                elif ch == 2:
                        inorder(prn)
                elif ch == 3:
                        postorder(prn)
                elif ch == 4:
                        x = int(values[1])
                        prn = insert(x,prn)
                elif ch == 5:
                        break

printf("######### end #########\n")

stdin.readline()
```