**Analysis and Design of Algorithms**

**Semester III**, Year **2021-22**

**Lab - 7**  Date : 22-11-2021

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**AIM:**

1.There are a total of numCourses courses you have to take, labeled from 0 to numCourses - 1. You are given an array prerequisites where prerequisites[i] = [ai, bi] indicates that you must take course bi first if you want to take course ai.

A. For example, the pair [0, 1], indicates that to take course 0 you have to first take course 1.

Return true if you can finish all courses. Otherwise, return false.

**Question 1:**

**Pseudo Code:**

START

CLASS course:

FUNCTION end(self, numCourses, preRequisites) -> bool:

IF not preRequisites:

RETURN True

ENDIF

map <- {}

for i, j in preRequisites:

IF i not in map:

map[i] <- set()

ENDIF

IF j not in map:

map[j] <- set()

ENDIF

map[i].add(j)

ENDFOR

visited <- {}

for i in range(numCourses):

IF i in map AND i not in visited:

IF dfs(map, visited, i) = False:

RETURN False

ENDIF

ENDIF

ENDFOR

RETURN True

ENDFUNCTION

FUNCTION dfs(self, map, visited, curr):

IF curr in visited:

IF visited[curr] = True: RETURN False

ELSE: RETURN True

ENDIF

ENDIF

visited[curr] <- True

curr\_res <- True

for nbr in map[curr]:

curr\_res <- curr\_res AND dfs(map, visited, nbr)

ENDFOR

visited[curr] <- False

RETURN curr\_res

ENDFUNCTION

ENDCLASS

numCourses <- int(input('Enter No.of Courses : '))

preRequisites <- []

n <- int(input('Enter size of Prerequisites Array : '))

OUTPUT 'Enter prerequisites : '

for i in range(n):

p <- list(map(int, input().split()))

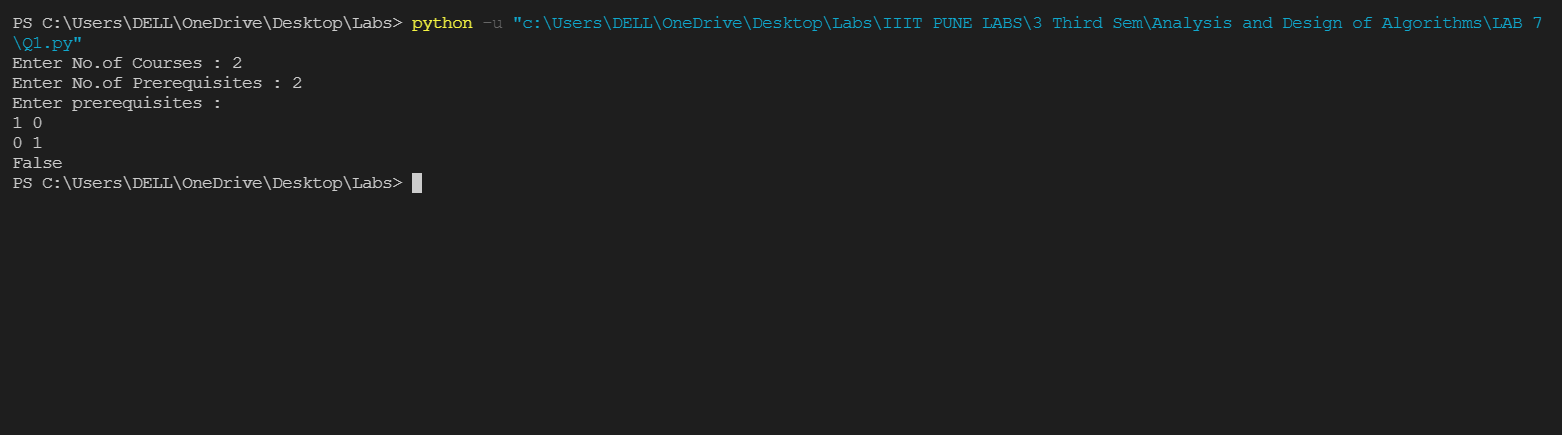
preRequisites.append(p)

ENDFOR

obj <- course()

OUTPUT obj.end(numCourses, preRequisites)END

**Output:**

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