

VASAVI COLLEGE OF ENGINEERING

(AUTONOMOUS)
(Affiliated to Osmania University)
Hyderabad - 500 031.

DEPARTMENT OF : CSE

NAME OF THE LABORATORY : DAA

Name K.S.I. SIVANI Roll No. —052 Page No. 47

PRELAB QUESTIONS - 4 :

- 1) What are the different types of graphs?
Give example for each.

→ Different types of graphs are Undirected graphs, directed graphs, weighted graphs, unweighted graphs, complete graphs, trees, sparse graphs.

- 2) How to detect cycle in the graph using degrees of nodes of graph? Analyze the time complexity?

~~→ bool isCyclic()
{ bool *visited =~~

→ bool hasCycle(int n)
{ int visited[10]; int i;
for(i=0; i<n; i++)
{ if(visited[i] == 1)
continue;
if(dfs(i, visited, -1))
return true;
}
}

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3) What are the walks, trails, paths, cycles, and circuits in graph? Explain with an example:

→ Walk: sequence of vertices and edges of a graph i.e. if we traverse a graph then we get a walk.

→ Trail: open walk in which no edge is repeated.

→ Circuit: Traversing a graph such that not an edge is repeated and it is closed also i.e. it is a closed trail.

→ Path: It is a trail in which neither vertices nor edges are repeated i.e. if we traverse graph such that we do not repeat a vertex and nor we repeat an edge. also known as open walk.

→ Cycle: Traversing a graph such that we do not repeat a vertex nor we repeat a edge but the starting and ending vertex must be same i.e. we can repeat starting and ending vertex only then we get a cycle.

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- Q) What are the complete graphs, wheels, hypercube, bipartite graph?
- Hypercube is the graph formed from the vertices and edges of n -dimensional hypercube.
- * If cube graph Q_3 is the graph formed by the 8 vertices and 12 edges of 3-D cube.
- Q_n has 2^n vertices and is a regular graph with n edges touching each vertex.
- Bipartite graph / bi graph is a graph whose vertices can be divided into 2 disjoint and independent sets. It is a graph that does not contain any odd-length cycles.
- Complete graph is a simple undirected graph in which every pair of distinct vertices is connected a unique edge.

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LAB PROGRAMS -4

→ Programs to implement ~~coin~~ Greedy algorithm.

1) Coins problem.

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
int b[10] = {0};
```

```
int c=0, j=0;
```

```
#define x 9
```

```
void coins (int n)
```

```
{ int a[x] = {1000, 500, 100, 50, 20, 10, 5, 2, 1};
```

```
int i;
```

```
if (n > 0)
```

```
{ for (i=0; i < x; i++)
```

```
{ if (a[i] <= n)
```

```
{ b[j] = a[i];
```

```
c++;
```

```
j++;
```

```
break; } }
```

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```
n = n - a[i];  
coins(n); }  
}  
int main()  
{ int m;  
  printf("Enter the amount:");  
  scanf("%d", &m);  
  coins(m);  
  printf("Minimum no. of notes required: %d\n", c);  
  for(int i=0; i<c; i++)  
  { printf("%d\t", b[i]); }  
  return 0; }
```

* Output:

Enter the amount: 70

Minimum no. of notes required: 2

50 20

Enter the amount: 121

Minimum no. of notes required: 3

100 20 1

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2) Scheduling and counting the jobs done by a person.

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
typedef struct
```

```
{ int start; int end; } Job;
```

```
int main()
```

```
{ int n, i, k;
```

```
printf("Enter the no. of jobs: ");
```

```
scanf("%d", &n);
```

```
printf("Enter the arrival and end time for  
each process:\n");
```

```
Job j[n], temp;
```

```
for(i=0; i<n; i++)
```

```
{ scanf("%d", &j[i].start);
```

```
scanf("%d", &j[i].end); }
```

```
for(i=0; i<n; i++)
```

```
{ for(k=0; k k<n; k++)
```

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```
if (j[k].end > j[k+1].end)
{
    temp = j[k];
    j[k] = j[k+1];
    j[k+1] = temp;
}
}

printf("Jobs done by the person : ");
printf("\n");
k = 0;
for (i = 1; i < n; i++)
{
    if (j[i].start >= j[k].end)
    {
        printf("%d\n", i);
        k = i;
    }
}

return 0;
```

Outputs:

Enter the no. of jobs: 6

Enter the arrival and end time for each process:

1
2
3
4
0
6
5
6
8
9
5
9

Jobs done by the person: 0 1 3 4 5 6