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Tutorial 14

Greedy approach, Backtracking

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Q1 Given $n = 5$
$W = 60$ kg.

	B_1	B_2	B_3	B_4	B_5
Weight	5	10	15	22	25
Price	30	40	45	77	90
Price/wt	6	4	3	3.5	3.6

$B_1 > B_2 > B_5 > B_4 > B_3$

(B1) 60 - 5 Price = 30
wt 55

(B2) wt 45 Price = 30 + 40

(B5) wt 20 Price = 30 + 40 + 90

wt Price = 30 + 40 + 90 + (20 × 3.5)
= ₹230

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```
#include<iostream>
using namespace std;
int main()
{
    int n;
    cout<<"Enter number of coin";
    cin>>n;
    int coin[n];
    for(int i=0;i<n;i++){
        cout<<"Enter "<<(i+1)<<"th coin"<<
    }

    for(int i=0;i<n;i++)
    {
        for(int j=0;j<n;j++)
        {
            if(arr[i]<arr[j])
            {
                int t=arr[i];
                arr[i]=arr[j];
                arr[i]=t;
            }
        }
    }
    int amt;
    cout<<"Enter amount";
    cin>>amt;
```

```
int min_coin = 0;
while (amt)
{
    int i;
    for (i = 0; i < n; i++)
    {
        if (amt >= arr[i])
        {
            amt -= arr[i];
            min_coin++;
            break;
        }
    }
    if (i == n)
    {
        cout << " not possible ";
        return 0;
    }
}
cout << " min coin " << min_coin;
}
```

Q3 Backtracking is an algorithm technique whose goal is to use brute force to find all solution to a problem. It entails gradually compiling a set of all possible solutions

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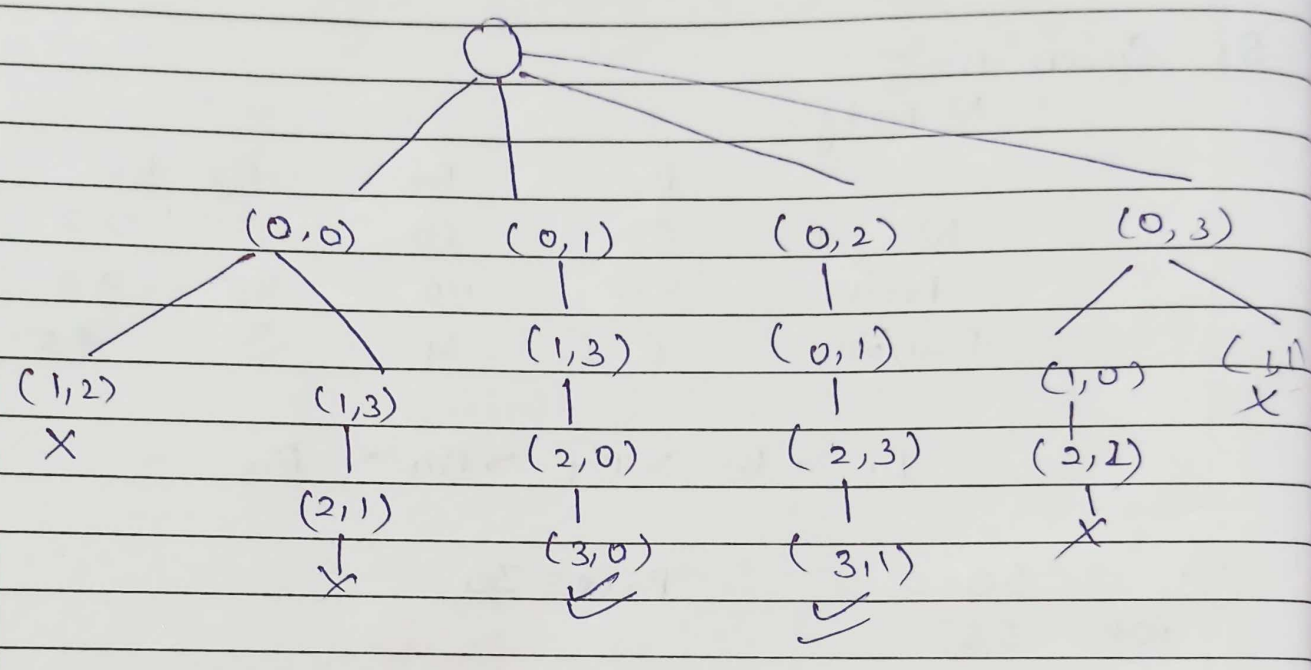
Q 4

	0	1	2	3
0	.	•	•	
1	•	.	.	•
2	.	.	•	•
3		•	•	



Q 5

Hamiltonian path ⇒ Cover every vertices one time and starting and ending point are not same

Hamiltonian ~~path~~ circuit → Covers every vertices one time and starting and end points are same

Hamiltonian graph ⇒ Contains either Hamiltonian path or ~~graph~~ circuit is called Hamiltonian graph.

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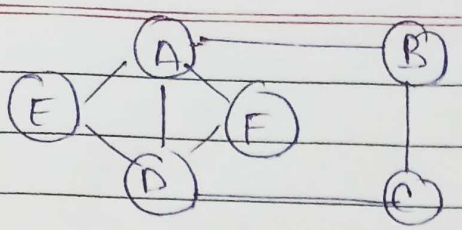
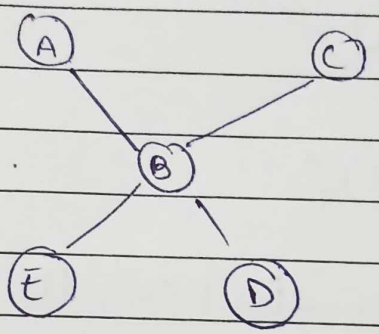
a)



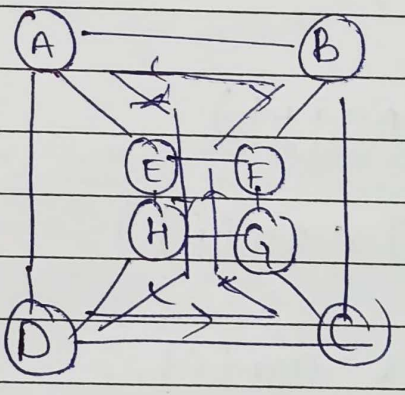
~~Have hamiltonian path~~
Hamiltonian graph X

b)

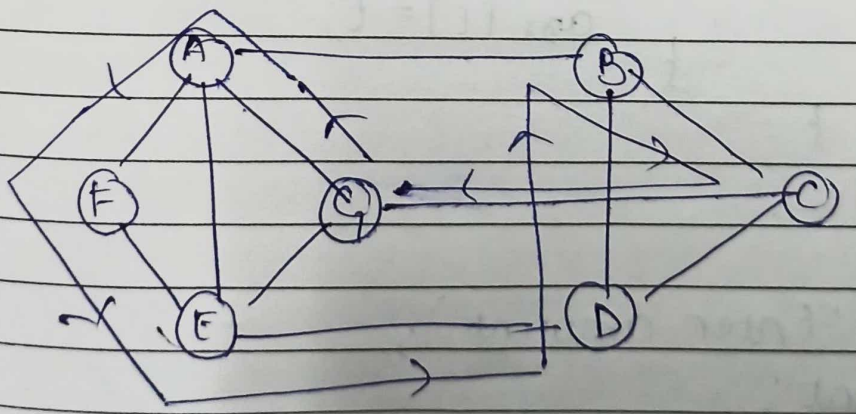


Not a hamiltonian graph X

c)



Hamiltonian graph ✓



Hamiltonian graph