Exp - 10	Unit Commitment

Aim:

To find the optimum committed units in power plant for given load demand.

Apparatus Required:

SI.No	Apparatus	Specification
1	PC	Dual core, RAM 512 MB 1.2 GHz speed, 80 GB
2	MATLAB	7.5

Theory:

Algorithm:

Step 1: Start the program

Step 2: Get the fuel cost parameter and fuel cost of each unit to find the fuel load average product cost

$$C_1 = K_1 \times \frac{H_i(P_{Gi})}{P_{Gi}}$$

Step 3: Form the priority order based on C_1

Step 4: Commit the number of corresponding priority

Step 5: Calculate P_{Gi} value

Step 6: Form the load curve, draw the priority order

Step 7: Determine the number of hours, H before the unit will be needed again

Step 8: Check for minimum shut down time. If yes go to last step otherwise continue

8.1: Calculate the true cost

8.2: Sum of average production cost

8.3: Recalculate the same for unit shut down and start up cost for either cooling or burn

Step 9: Display the result

Step 10: Stop the program

Program:

```
clc;
clear all;
n=input('Enter the number of units:');
for i=1:n
   for j=1:n
      h(i,j)=input('Enter the heat rate characteristics value');
   end
end
for i=1:n
Unit=i
pgmin(i)=input('Enter the minimum generating limit:');
pgmax(i)=input('Enter the maximum generating limit:');
fuelcost(i)=input('Enter the fuel cost:');
end
pd=input('Enter the load demand:');
for i=1:n
   for j=1:n
      f(i,j)=h(i,j)*fuelcost(i);
   end
end
f
for i=1:n
    prodcost(i)=((f(i,1)*pgmax(i)^2)+(f(i,2)*pgmax(i)+f(i,3)));
end
prodcost
for i=1:n
   avgprodcost(i)=prodcost(i)/pgmax(i);
end
avgprodcost
sortlist=sort(avgprodcost)
for i=1:n
   for j=1:n
   if sortlist(i)==avgprodcost(j)
     k(i)=j;
   end
  end
end
k
m=n;
for i=1:n
  maxprodlist(i)=sum(pgmax(k(1:m)));
  m=m-1;
end
maxprodlist
z=n;
for i=1:n
  if pd>maxprodlist(z)
   z=z-1;
  end
end
```

```matlab
disp('The units committed to satisfy the demand are:');
k(1:z)
```

Result: