SOURCE CODE

CODE:

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#include <stdio.h>
#include <conio.h>
#include <stdlib.h>
#include <iostream>
#include<bits/stdc++.h>
#include <malloc.h>
using namespace std;
int main(){

srand( (unsigned)time( NULL ) );

int n,i,id=0,sta=0,stb=0,stc=0,st1,st2,st3;
struct node
{    int idno;
    int at;
    int st;
    int rst;
    int tt;
    int wt;
    int ft;
    int dt;
    char c;

    struct node *next;
};

struct node *list = NULL;
struct node *tail = NULL;
struct node *outlist = NULL;
struct node *outtail = NULL;

struct node *temp, *temp1,*temp2, *temp3;

for(i=0;i<200;i++){

  n=rand()%100;

  cout << "Time= "<<i<<"   "<<"Random Number= "<<n<< endl;
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if(n<50){cout <<"customer arrived  "<<id+1<< endl<< endl;getch();
          temp=new(node);
          temp->idno=++id;
          temp->at=i;
          temp->st=0;
          temp->rst=0;
          temp->tt=0;
          temp->wt=0;
          temp->ft=0;
          temp->c='x';
          temp->next=NULL;

          if(list==NULL){list=temp;tail=temp;}


          else if(list!=NULL){tail->next=temp;tail=temp;};

         };

          if(list!=NULL){
          if(sta==0){ cout<<"Able is free"<<endl;
                    temp1=list;list=list->next;

                     n=rand()%100;
                     if(n<20)st1=2;
                     else if (n<50)st1=3;
                     else if (n<80)st1=4;
                     else if (n<100)st1=5;
                     cout<<"st="<<st1<<endl;

                     temp1->st=st1;

                     temp1->rst=st1;

                     temp1->c='A';
                     sta=1;

                   }

                   else if (stb==0)
                     { cout<<"Baker is free"<<endl;
                     temp2=list;list=list->next;
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                    n=rand()%100;
                    if(n<20)st1=4;
                    else if (n<50)st1=5;
                    else if (n<80)st1=6;
                    else if (n<100)st1=7;
                    cout<<"st="<<st1<<endl;

                    temp2->st=st1;

                    temp2->rst=st1;

                    temp2->c='B';
                    stb=1;
                  }
                  else if (stc==0)
                    { cout<<"Cable is free"<<endl;
                    temp3=list;list=list->next;

                    n=rand()%100;
                    if(n<20)st1=4;
                    else if (n<50)st1=7;
                    else if (n<80)st1=8;
                    else if (n<100)st1=9;
                    cout<<"st="<<st1<<endl;

                    temp3->st=st1;

                    temp3->rst=st1;

                    temp3->c='C';
                    stc=1;
                  }
if(sta==1){ temp1->rst=temp1->rst-1;
  if (temp1->rst==0){ sta=0;temp1->ft=i;temp1->tt=temp1->ft-temp1->at;
  if(outlist==NULL){ outlist=temp1;outtail=temp1;}
     else{outtail->next=temp1; outtail=temp1;};}} cout<<"sta=  "<<sta<<endl;


    if(stb==1){ temp2->rst=temp2->rst-1;
          if (temp2->rst==0){ stb=0;temp2->ft=i;temp2->tt=temp2->ft-temp2->at;
        if(outlist==NULL){outlist=temp2;outtail=temp2;}
        else{outtail->next=temp2; outtail=temp2;}}} cout<<"stb=  "<<stb<<endl;

     if(stc==1){ temp3->rst=temp3->rst-1;
```

```
        if (temp3->rst==0){ stb=0;temp3->ft=i;temp3->tt=temp3->ft-temp3->at;

         if(outlist==NULL){outlist=temp3;outtail=temp3;}
         else{
            outtail->next=temp3; outtail=temp3;}}} cout<<"stc=  "<<stc<<endl;

            temp=list;
            while(temp!=NULL){temp->wt+=1; temp=temp->next;
            }

 cout<<"current time="<<i<<endl<<endl;
       } ;
cout<<"simulation closes"<<endl<<endl;

      float  twt=0, awt, ttt=0,att;
      int ableC=0, bakerC=0, cableC=0, QC=0, TC=0;

      temp=outlist;

      while(temp!=NULL){ twt= twt+temp->wt;
                  ttt=ttt+temp->tt;

         if(temp->c=='A')
         ableC++;
         else if(temp->c=='B')
         bakerC++;
         else if(temp->c=='C')
         cableC++;
         else QC++;
         temp=temp->next;

      }
         awt=twt/float(id);
         att=ttt/float(id);
         cout<<"average Waiting time =  "<<awt<<endl<<endl;

         cout<<"average Turn-around time  =  "<<att<<endl<<endl;

            cout<<"Total customers  =  "<<TC<<endl<<endl;

   cout<<"No. of customers served by Able  =  "<<ableC<<endl<<endl;

   cout<<"No. of customers served by Baker  =  "<<bakerC<<endl<<endl;
```

```
	cout<<"No. of customers served by Cable =  "<<cableC<<endl<<endl;

	cout<<"No. of customers left in the Q  =  "<<QC<<endl<<endl;
}
	    }
```