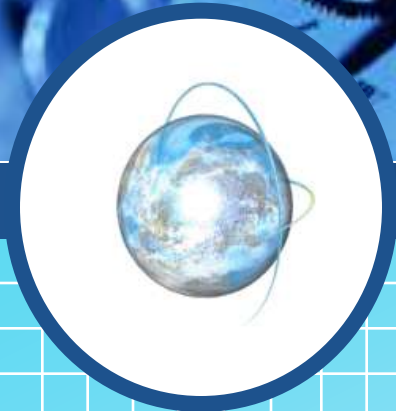


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

برنامه نویسی به زبان C++

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قسمت دوم



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مطالب جالب
اخبار سياسي و لحظه اي
و ...

مرجع نمونه سنوالات و حل تمرين ها
اخبار فناوري اطلاعات و مقالات آموزشي
تالار گفتمان درسي با حضور اساتيد

تمرین 1

```
# include<iostream.h>
int main()
{float a[5];
cout<<"Enter 5 numbers:"<<endl;
for(int i=0;i<5;i++)
{cout<<"\ta["<<i<<"]:";
cin>>a[i]; }
cout<<"In reverse order,they are:" <<endl;
for(i=4;i>=0;i--)
cout<<"\ta["<<i<<"]:"<<a[i]<<endl;
return 0;
}
```

تمرین 2

```
include<iostream.h>#
```

```
int main()  
{float a[5];  
cout<<"Enter 5 numbers:"<<endl;  
for(int i=4;i>=0;i--)  
{cout<<"\ta["<<i<<"]:";  
cin>>a[i]; }  
cout<<"In reverse order,they are:" <<endl;  
for(i=0;i<5;i++)  
cout<<"\ta["<<i<<"]:"<<a[i]<<endl;  
return 0;  
}
```



تمرین 3

```
# include<iostream.h>
float ave(int[],int n);
int main()
{int a[]={11,33,55,77};
int size= sizeof(a)/sizeof(int);
cout<<"ave(a,size)="<<ave(a,size)<<endl;
return 0;
}
float ave(int a[],int n)
{int sum=0;
for(int i=0;i<n;i++)
{sum +=a[i];
return sum/n; }
}
```



تمرین 4

```
# include<iostream.h>
void read(int[],int&);
void print(int[],int);
const int MAXSIZE=100;
int main()
{
int a[MAXSIZE]={0},size;
read(a,size);
cout<<"The array has"<<size<<"elements:";
print(a,size);
return 0;
}
void read(int a[],int& n)
{cout<<"enter integers.Terminate with 0:\n";
n=0;
do
{cout<<"a["<<n<<"]:";
cin>>a[n];}while(a[n++] !=0 && n<MAXSIZE);
--n;}
void print(int a[],int n)
{
float sum=0;float ave=0;
for(int i=0;i<n;i++)
cout<<a[i]<<" ";
for(i=0;i<n;i++)
{sum+=a[i];}
ave=sum/n;cout<<"sum="<<sum<<" "<<"ave="<<ave;}
```



تمرین 5

```
# include<iostream.h>
int main()
{unsigned int a[]={22,44,66,88};
for(int i=0;i<4;i++)
{
    cout<<"a+"<<i<<"="<<a+i<<endl;
    cout<<"*(a+"<<i<<"")="<<*(a+i)<<endl;
}
return 0;}
```

تمرین 6

```
# include<iostream.h>
int index(int,int[],int);
int main()
{int a[]={22,44,66,88,44,66,55};
cout<<"index(44,a,7)="<<index(44,a,7)<<endl;
cout<<"index(50,a,7)="<<index(50,a,7)<<endl;
return 0;}
int index(int x,int a[],int n)
{for(int i=n-1;i>=0;i--)
if(a[i]==x)return i;
return n;
}
```




تمرین 7

```
# include<iostream.h>
bool isNondecreasing(int a[],int n);
int main()
{int a[]={88,66,44,22,44,66,55};
cout<<"isNondecreasing(a,4)="<<isNondecreasing(a,4)<<endl;
cout<<"isNondecreasing(a,7)="<<isNondecreasing(a,7)<<endl;
return 0;}
bool isNondecreasing(int a[],int n)
{for(int i=1;i<n;i++)
if(a[i]>a[i-1])return false;
return true;}
```



تمرین 8

```
#include<iostream.h>
float min(float[],int);
int main()
{float a[]={17.3,64.3,64.17,17.17,23.4,9.7,34.6};int n;cout<<"enter n:"<<endl;cin>>n;
cout<<"min(a,n)="<<min(a,n)<<endl;
return 0;
}
float min(float a[],int n)
{float min=a[0];
for(int i=1;i<n;i++)
if(a[i]<min){float temp=a[i];a[i]=min;min=temp;}
return min;
}
```



تمرین 9

```
# include<iostream.h>
float minIndex(float[],int);
int main()
{float a[]={17.3,64.3,64.17,17.17,23.4,9.7,34.6};int n;cout<<"enter
n"<<endl;cin>>n;
cout<<"minIndex(a,n)="<<minIndex(a,n)<<endl;
return 0;
}
float minIndex(float a[],int n)
{float min=a[0];int index=0;
for(int i=1;i<n;i++)
if(a[i]<min){float temp=a[i];a[i]=min;min=temp;index=i;}
return index;
}
```



تمرین 10

```
# include<iostream.h>
void getExtremes(float&,float&,float[],int);
int main()
{float a[]={215,55.3,3.53,13.2,168.2,12.2,35.8,190.5,2.2};float min,max;
int n=sizeof(a)/sizeof(float);
getExtremes(min,max,a,n);
cout<<"min="<<min<<" "<<"max="<<max<<endl;
return 0;}
void getExtremes(float& min,float& max,float a[],int n)
{min=a[0];
max=a[1];if(a[0]>a[1]){float temp=min;
min=max;
max=temp;}

for(int i=2;i<n;i++)
{if(a[i]>max){float temp1=a[i];
a[i]=max;
max=temp1;}

if(a[i]<min){float temp=a[i];
a[i]=min;
min=temp;}

}}
```



تمرین 11

```
# include<iostream.h>
void largest(float&,float&,float a[],int);
int main()
{float a[]={52.3,67.5,115.78,12.5,14.87,189.3};float max1,max2;
int n=sizeof(a)/sizeof(float);
largest(max1,max2,a,n);
cout<<"max1="<<max1<<" "<<"max2="<<max2<<endl;
    return 0;}

void largest(float& max1,float& max2,float a[],int n)
{max1=a[0];max2=a[1];if(a[0]<a[1]){float temp=max1;
    max1=max2;

        max2=temp;}
for(int i=2;i<n;i++)
{if(a[i]>max2){float temp=max2;
    max2=a[i];

        a[i]=temp;}
if(max2>max1){float temp=max1;
    max1=max2;

        max2=temp;}
}}
```



تمرین 12

```
# include<iostream.h>
using namespace std;
void remove(float[],int&,int);int main()
{float a[]={55.5,22.2,99.9,66.6,44.4,88.8,33.3,77.7};
int n=sizeof(a)/sizeof(float);int i;
remove(a,n,i);
cout<<"n="<<n;
return 0;}
void remove(float a[],int& n,int i)
{cout<<"enter one number:";
cin>>i;for(int j=0;j<i;j++);
for(j=i;j<n;j++)a[j]=a[j+1];n=n-1;
for(j=0;j<n;j++)cout<<"a["<<j<<"]="<<a[j]<<endl;}
```



تمرین 13

```
# include<iostream.h>
bool removeFirst(float[],int&,float);
int main()
{float a[]={13.5,54.36,987.3,9.2,36.5,148.2,63.5};int n;float x;
cout<<"removeFirst(a,n,x)="<<removeFirst(a,n,x)<<endl;
return 0;}
bool removeFirst(float a[],int& n,float x)
{cout<<"enter n,x:"<<cin>>n>>x;
for(int i=0;i<n;i++)if(x==a[i])
for(int j=i;j<n;j++){a[j]=a[j+1];}n=n-1;
for(int j=0;j<n;j++)cout<<"a["<<j<<"]="<<a[j]<<" ";return true;
return false;}
```



تمرین 14

```
# include<iostream.h>
void removeAll(float[],int&,float);
int main()
{float a[]={13.5,9.2,54.36,987.3,9.2,36.5,148.2,63.5,9.2,9.2};int n;float x;
removeAll(a,n,x);
cout<<"n="<<n;
return 0;}
void removeAll(float a[],int& n,float x)
{cout<<"enter n,x:";cin>>n>>x;
for(int i=0;i<n;i++)if(x==a[i])
{for(int j=i;j<n;j++){a[j]=a[j+1];}n=n-1;i=i-1;}
for(int j=0;j<n;j++)cout<<"a["<<j<<"]="<<a[j]<<" ";
```


تمرین 15

```
include<iostream.h>#
void rotate(int[],int,int);
int main()
{int a[]={22,33,44,55,66,77,88,99};
int n,k;
cout<<"enter n:";cin>>n;
rotate(a,n,k);for(int i=0;i<n;i++)
cout<<a[i]<<endl;
return 0;
}
void rotate(int a[],int n,int k)
{cout<<"enter k:";
cin>>k;
if(k>0){for(int i=1;i<=k;i++){float temp=a[n-1];{for(int j=n-2;j>=0;j--)a[j+1]=a[j];}
a[0]=temp;}}
else if(k<0){for(int i=-1;i>=k;i--){float temp=a[0];{for(int j=0;j<n-1;j++)a[j]=a[j+1];}
a[n-1]=temp;}}
}
```



تمرین 16

```
# include<iostream.h>
void append(int[],int,int[],int);
int main()
{int a[]={22,33,44,55,66,77,88,99};
int b[]={20,30,40,50,60,70,80};int m,n;int size=sizeof(a)/sizeof(int);
cout<<"enter m,n:";cin>>m>>n;
append(a,m,b,n);
for(int i=0;i<size;i++)cout<<a[i]<<" ";
return 0;}
void append(int a[],int m,int b[],int n)
{int size=m+n;int j=0;
for(int i=m;i<size;i++)
{a[m]=b[j];m+=1;j+=1;}
}
```



تمرین 17

```
# include<iostream.h>
void insert(float[],int&,float);
int main()
{float a[9]={9.4,16.5,33.67,35.3,45.9,70.6,99.3,99.9};float x;cout<<"enter x:";cin>>x;
int n=sizeof(a)/sizeof(float);insert(a,n,x);
for(int k=0;k<n;k++)cout<<a[k]<<" ";
return 0;}
void insert(float a[],int& n,float x)

{int k;for(k=0;k<n-1;k++)if(a[k]<=x && a[k+1]>=x){for(int j=n-2;j>k;j--)a[j+1]=a[j];
if(j=k)a[k+1]=x;break;}}
```



تمرین 18

```
# include<iostream.h>
int frequency(float[],int,int);
int main()
{float a[]={22.4,44,23.67,12.7,44,44,125.7,44};int n,x;
cout<<"enter
  n,x";cin>>n>>x;cout<<"frequency="<<frequency(a,n,x)<<endl;
return 0;}
int frequency(float a[],int n,int x)

{int f=0;

for(int i=0;i<n;i++){if(a[i]==x)f+=1;}
  return f;}
```



تمرین 19

```
# include<iostream.h>
void reverse(int [],int);
int main()
{int a[]={22,33,44,55,66,77,88,99};int n;
cout<<"enter n:";cin>>n;
reverse(a,n);for(int i=0;i<n;i++)cout<<a[i]<<" ";
return 0;}
void reverse(int a[],int n)
{int j=n-1;for(int i=0;i<(n/2);i++){int temp=a[i];
a[i]=a[j];a[j]=temp;j--;}}
```



تمرین 20

```
# include<iostream.h>
void add(float[],int,float[]);
int main()
{float a[]={2.2,3.3,4.4,5.5,6.6,7.7,8.8,9.9};
float b[]={6.0,5.0,4.0,3.0,2.0,1.0};int n;
int size=sizeof(a)/sizeof(float);
cout<<"enter n:";cin>>n;add(a,n,b);
for(int i=0;i<size;i++)cout<<a[i]<<" ";
return 0;}
void add(float a[],int n,float b[])
{int j=0;for(int i=0;i<n;i++)
{a[i]=a[i]+b[j];j++;}}
```



تمرین 21

```
# include<iostream.h>
float  outerProduct(float p[][3],float a[],float b[]);
int main()
{float a[]={2.2,3.3,4.4};
float b[]={2.0,-1.0,0.0};float p[3][3];
outerProduct(p,a,b);for(int i=0;i<3;i++){for(int j=0;j<3;j++)cout<<p[i][j]<<"
";}cout<<endl;}
return 0;}
float  outerProduct(float p[][3],float a[],float b[])
{for(int i=0;i<3;i++){
for(int j=0;j<3;j++)p[i][j]=a[i]*b[j];}
return p[3][3];}
```



تمرین 22

```
# include<iostream.h>
int mgh(int a[][3],int k[][3]);
int main()
{int a[3][3]={{11,22,33},{44,55,66},{77,88,99}};int k[3][3];
mgh(a,k);
for(int i=0;i<3;i++){for(int j=0;j<3;j++)cout<<k[i][j]<<" ";}cout<<endl;}
return 0;}
int mgh(int a[][3],int k[][3])
{
int i=0;for(int j=0;j<3;j++)k[j][2]=a[i][j];
i=1;for(j=0;j<3;j++)k[j][i]=a[i][j];
i=2;for(j=0;j<3;j++)k[j][0]=a[i][j];
return k[3][3];
}
```


تمرین 1

```
int* in(int a,int m)
{for (i=0; i<5; i++ )
if ( a(i)=m) a=& a(i);}
int main ()
{int a(5); int m;
cout<< "enter five number" ;
for (i=0; i<5; i++ )
cin >>a(i);
cout << "enter one numbe" ;
int* in(int a,int m);
cout << "adress m= " <<a;
return 0;
}
```

تمرین 2

```
{
void build(float* p, int n)
    cout <<"enter number of items:"; cin >>n;
    p=new float[n];
    cout <<"enter " <<n<<"numbers:"<<endl;
    for (int i=0;i<n; i++)
        {cout<<"\t" << i <<i<< " ";
        cin >> p[i];}
    {
void print(float* p,int n)
{

    for (int i=0; i< n; i++ )
        cout <<"p[i]="<< " ";
        cout << endl;
}

# include<iostream.h>

int main()
{
    float p[];
int n;
build(p,n);
print(p,n);
cout << build(p,n) << endl;
return 0;
}
```

تمرین 4

```
const int size=n;
```

```
void abs (float* p )
```

```
#include <iostream>  
using namespace std;  
int main()
```

```
{  
    float *p[n];  
    abs( *p );  
    return 0;  
}
```

```
{  
    void abs (float* p[n])  
    for(int i=0; i<n; i++ )
```

```
        if      *)p[i]<0) *p[i] *=-1;
```

```
        for (int i=0; i<n; i++ )  
        cout <<      "*p[i]=" << *p[i]<< endl;  
    }
```

تمرین 6

```
unsigned len(const char* s)
s =new char[const];
unsigned z;
cout<<"please enter const char:"<<endl;
for (int i=1; i<const; i++)
cin<<s;
if (s !='\0');
++s;
else break;
z=s;
return z;
#include <iostream.h>
int main()
{
char* s;
cout<<"len(s)= "<<len(s)<<endl;
return 0;
}
```

تمرین 7

```
void cpy (char*s1, const char* s2);
{char *s3='0'; char* end =s3-s2;
for (i=s1; i<=end; i++ )
{s(i)=s* (s2+i); cout << s(i);}
int main()
{char*s1,s3,s4,end; const char*s2;
cout <<"enter sentense ";
s3='0' ;
for (i=s1; i<=s3; i++)
cin>> s(i);
void cpy (char*s1,const char*s2 );
s4=s1+(end);
for (i=s4,i<=s3; i++)
coyt <<*s;
return 0;
}
```

تمرین 8

```
int product (int(*pf) (int k),int& n)
{//returns the mutiple f(1)*f(2)...*f(n)
int s=0;
for (int i=1; i<=n; i++)

s *=(*pf) (i);
return s;
}
int mult (int k)

{return k*k;
}
#include<iostream.h>
int main()
{int n;
product(mult,n);
cout <<product(mult,n) <<endl;
return 0;
}
```

تمرین 9

```
char * chr(char*s,char c)
{char *s2='0';
for i=s,i<=s2,i++ )
{if (*s(i)=c ) char*m=s(i)
else m=null;}
int main()
{char*s,s2,m;char c;
cout<<"enter sentence" ;
s2='0';
for (i=s;i<=s2;i=++)
cin >>s(i);
char* chr(char*s,char c);
cout <<"m"<<m;
return 0;}
```

تمرین 10

```
int product (int(*pf) (int k),int& n)
{// returns the mutiple f(1)*f(2)...*f(n)
    int s=0;
    for (int i=1; i<=n; i++)

s *=(*pf) (i);
return s;
}
int mult (int k)

{return k*k;
}
#include<iostream.h>
int main()
{int n;
product(mult,n);
cout <<product(mult,n) <<endl;
return 0;
}
```


تمرین 2

```
# include<iostream.h>
using namespace std;
int main()
{char buffer[80];
cin.get line(buffer,80,'$');
char* name[4];
name[0]=buffer;
int count=0;
for(char *p=buffer;*p!='\0';p++)
if(*p=='\n')
{*p='\0';
name[count++]=p+1;
}
cout<<"the names are:";
for(int i=0;i<count;i++)
cout<<name[i]<<endl;
}
```



تمرین 3

```
# include<iostream.h>
```

```
# include<cstring>
```

```
using namespace std;
```

```
int main()
```

```
{char s[];
```

```
int m=strlen(s);
```

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

```
cin>>s[i];
```

```
for(i=m;i>=0;i--)
```

```
cout<<s[i]<<endl;
```

```
}
```



تمرین 4

```
# include<iostream.h>
using namespace std;
int main()
{char word[80];
do
{cin>>word;
if(*word)
cout<<word<<endl;
}
while(*word)
}
```

تمرین 5

```
# include<iostream.h>
using namespace std;
int a(char ch[]);
int main()
{char ch[80];
cin.get line(ch,80);
cout<<a(ch)<<endl;
}
```

تمرین 7

```
# include<iostream.h>
using namespace std;
int main()
{char word[5][15];
cout<<"enter at most 5 word with at most 14 char:";
count=0;
for(i=0;i<5;i++)
{cin>>name[i];
while(cin.get(ch))
if(ch=='m')++count; break;}
}
```

تمرین 8

```
# include<iostream.h>
using namespace std;
int main()
{char ch[80];
cin.getline(ch,80);
while(cin.get(ch))
ch+='A'-'a';
cout<<ch<<endl;
}
```



تمرین 9

```
# include<cctype>
# include<iostream.h>
using namespace std;
int main()
{char ch[80];
cin.getline(ch,80);
while(cin.get(ch))
cout.put(char(tolower(ch)))endl;
}
```



تمرین 10

```
# include<iostream.h>
using namespace std;
int main()
{char ch[80];
cin.getline(ch,80);
while(cin.get(ch))
}count=0;
if(ch=='0')
++count;
}
cout<<ch<<count<<endl;
int a(charch[])
{int count=0;
while(cin.get(ch))
if(ch=='m') ++count;
return count;
}
```




تمرین 11

```
# include<iostream.h>
char inveres(ch, );
int main()
{char ch="ABCD";
cin>>ch;
cout<<"inveres(ch)<<" " <<endl;
inveres(ch,int i,j)
for(i=0;i<5;i++)
cin>>ch;
for(i=j;i>=0;i--)
ch[j]=ch[i]; j++;
return(ch[j]);
}
```



تمرین 15

```
# include<iostream.h>
int main()
{char line[80];
int count=0;
do
cin.get(ch);
for(i=0;i<n;i++)
if(ch==' '||ch=='\n')
count++;
if(ch==e)
count++;
}
```

تمرین 1

```
class point{
public:
point();
point(const point&p):x(p.x),y(p.y),z(p.z)
void negate();
float norm();
void point();
private:
float x;
float y;
float z;
};
point::point()
{
x=y=z=0
}
void point::negate()
{
x=-x;y=-y;z=-z;
}
float point::norm()
{
return sqrt((x*x)+(y*y)+(z*z));
}
void point::point()
cout<<"x is:"<<x<<"y is:"<<y<<"z is:"<<z;}
{
```

تمرین 2

```
class stack{
public:
    stack();
    ~ stack();
    void push(const int& x);
    int* pop(int &x);
    boolean isempty();
    boolean isfull();
private:
    int top;
    int* stack;
    int maxsize;
};
stack::stack(int
    maxstacksize):maxsize(maxstack
    size)
}
stack=new int[maxsize];
top=-1;
{
boolean stack::isfull()
}
```

```
if(top==maxsize-1) return true;
else
return false;
{
boolean stack::isempty()
if(top==-6) return true;}
else return false;
void stack::push(const &x){
if(isfull())
cout<<"stack is full";
else stack[++top]=x;
{
int *stack::pop(int &x){
if(isempty())
cout<<"stack is empty";
return 0;
else
x=stack[--top];
return &x;
}
stack::~~stack(){
delete[]stack;
}}
```

تمرین 3

```
class time{
public:
    time();
    int get hour(); int get minute(); int get second();
    void advance(int h, int m ,int s);
    void reset(int h,int m ,ints);
    void print();
private:
    int hour;
    int min;
    int sec;
time::time() {hour=min=sec=0;}
void time::reset(int h,int m,int s){
hour=(h>=0 && h<24)?h:0;
min=(m>=0 && m<60)?m:0;
sec=(s>=0 && s<60)?s:0;
}
int time::get hour(){
return hour;
}
int time::get minute(){
return min;
}
time::get second(){
return sec;
}
void time::print(){
cout<<"hour is:"<<hour<<"minute is:"<<min<<"second is:"<<sec<<endl;
}
void time::advance(int h,int m,int s){
hour+=h;
min+=m;
sec+=s;
}
```

تمرین 5

```
class person{
public:
    person();
    ~ person();
    int get birthday();
    int get dieday();
    char *getname();
    void print();
private:
    char *name;
    int birthday;
    int dieday;
};
person::person([
    name=new char[30]);{
int person::get birthday(){
    return birthday;
}
int person::get dieday(){
    return dieday;
}
char *person::print(){
    cout<<"person name is:"<<nmae<<"birthday is:"<<birthday<<"dieday is:"<<dieday<<endl;
person::~~person(){
delete [] name;
}
```



تمرین 6

```
class matrix{
public:
    matrix();
    matrix(const matrix& m):mat[1][1](m[1][1]),mat[1][2](m[1][2]),mat[2][1](m[2][1]),mat[2][2](m[2][2]);
    matrix inverse();
    float det();
    boolean is singular();
    void print();
private:
    float*mat;
};
matrix::matrix(){mat=new float[2][2];}
matrix*matrix::inverse(){if (is singular())
    cout<<"not able"
else
    temp=mat[1][1]; mat[1][1]=mat[2][2]; mat[2][2]=temp; r=1/(det()); mat[1][2]=-mat[1][2]; mat[2][1]=-mat[2][1];
for(i=0;i<2;i++)
    for(j=0;j<2;j++)
        r*mat[i][j];
return &matrix;
}
float matrix::det(){ return mat[1][1]*mat[1][2]*mat[2][1];}
boolean matrix::is singular(){
if(det())
    return 0;
else
    return 1;
}
void matrix::print(){
for(i=0;i<2;i++){
for(j=0;j<2;j++)
    cout<<mat[i][j]<<setw(4);
    cout<<endl;
}
}
```



تمرین 7

```
class point{
public:
    point();
    point(const point &p):x(p.x),y(p.y)
    void negate();
    float norm();
    void print();
private:
    float x;
    float y;
};
point::point();
{
x=y=0;
}
void point::negate()
{
x=-x; y=-y;
}
float point::norm(){
return sqrt((x*x)+(y*y));
}
void point::print(){
cout<<"x is:"<<x<<"y is:"<<y;
}
```




تمرین 8

```
class circle{
public:
    circle();
    float getreduce();
    float getx();
    float gety();
    float area();
    float circumference();
private:
    float x,y;
    float reduce;
};
circle::circle(){
x=y=0; reduce=1;}
float circle::getreduce(){ return reduce;}
float circle::getx(){ return x;}
float circle::gety(){ return y;}
float circle::area(){ return reduce*reduce*3.14;}
float circle::circumference(){ return 2*3.14*reduce;}
```

تمرین 9

```
class stack{
public:
    stack();
    ~ stack();
    void push(const int &x);
    int *pop(int &x);
    boolean isempty();
    boolean isfull();
    int count();
private:
    int top;
    int *stack;
    int maxsize;
};
int stack::count(){
if (isempty())
    return 0;
else
if (isfull())
    return (maxsize-1);
return top++;}
```



تمرین 10

```
class stack{
public:
    stack();
    ~ stack();
    void push(const int &x);
    int &pop(int &x);
    boolean isempty();
    boolean isfull();
    int count();
    void print();
private:
    int top;
    int *stack;
    int maxsize;
};
void stack::print(){
    if (isempty())
        cout<<"the stack is empty"<<endl;
    for(int i=0;i<top;i++)
        cout<<stack[i]<<setw(4);
}
```



تمرین 11

```
class stack{
public:
    stack();
    ~ stack();
    void push(const float &x);
    float *pop(float &x);
    boolean isempty();
    boolean isfull();
    int count();
    void print();
private:
    int top;
    float *stack;
    int maxzize;
}
```