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

void main( )
{
char *a[ ]={"DELHI", "MUMBAI","VARANSAI"};
char **p;
p=a;
cout<<*p<<”   “<<*a<<”\n”;  // *2000 =1000 = DELHI
cout<<*p+1<<"  "<<*a+1<<"\n";     //*2000 +1 = 1000+1= 1001 = ELHI
cout<<*(p+1)<<"  "<<*(a+1)<<"\n";  // *(2000+1)= *(2002) = 1006 = MUMBAI
cout<<*a<<","<<*(a+1)<<","<<*(a+2)<<endl;
cout<<sizeof(a)<<", "<<sizeof(a[0])<<", "<<sizeof(p)<<endl;  // a is array having
3 location each of 2 bytes
cout<<++*p<<", "<<*++p<<endl;
  // *++p is evaluated first which is *(++2000)=*(2002) = 1006= MUMBAI
//++*p  is  ++(*2002) as p now contains 2002 =++1006 = 1007 = UMBAI
cout<< **a << ", "<<a[1]<<"," <<*(a+1)<<", " <<a[2]<<endl;
}
```

Memory allocation (first declaration)

P 2000

a 2000

2000	2002	2004
1000	1006	1013
0	1	2

1000						1006							1013								
D	E	L	H	I	\0	M	U	M	B	A	I	\0	V	A	R	A	N	A	S	I	\0

OUTPUT

```
DELHI DELHI
ELHI  ELHI
MUMBAI  MUMBAI
DELHI,MUMBAI,VARANSAI
6, 2, 2
 UMBAI, MUMBAI
D, UMBAI,UMBAI, VARANSAI
```

Note: In the below declaration each string will be allocated exactly 10 bytes whereas in the above declaration exact number of bytes including \0 will be allocated so that no wastage of memory is there. The size of an array is number of bytes allocated for it in memory. Any increment decrement on array names is an error since it is a constant pointer.

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

```
#include<conio.h>
void main( )
{char a[ ][10]={"DELHI", "MUMBAI","VARANSAI"};
char (*p)[10];  // p is a pointer to array having second dimension 10
p=a;
cout<<*p<<"   "<<*a<<"\n";  // *2000 =1000 = DELHI
cout<<*p+1<<"  "<<*a+1<<"\n";
cout<<*(p+1)<<"  "<<*(a+1)<<"\n";
cout<<*a<<","<<*(a+1)<<","<<*(a+2)<<endl;
cout<<sizeof(a)<<", "<<sizeof(a[0])<<", "<<sizeof(p)<<endl;
cout<< **a << ", "<<a[1]<<"," <<*(a+1)<<", " <<a[2]<<endl;
}
```

Memory allocation

P 2000

a 2000

2000	2002	2004
1000	1010	1020
0	1	2

1000										1010																1020	
D	E	L	H	I	\0					M	U	M	B	A	I	\0				V	A	R	A	N	A	S	I	\0	

OUTPUT

ELHI ELHI

MUMBAI MUMBAI

DELHI,MUMBAI,VARANSAI

30, 10, 2

D, MUMBAI,MUMBAI, VARANSAI

Note: All address will be displayed as hexadecimal numbers . In the below question each address displayed , ie a, a+1 and a+2 differs by 2 bytes as each address requires two bytes in memory.

```
#include<iostream.h>
#include<conio.h>
#include<stdlib.h>
void main( )
{clrscr();
char b[20];
char *a[]={"Physics","English","Computer"};
cout<<a<<"    "<<&a[0][0]<<"\n";  //0x8fc1fff0   Physics
cout<<*a<<"\t"<<a[0]<<"\n";  //Physics   Physics
cout<<**a<<"\n"; //P
cout<<a+1<<"\n"; //0x8fc1fff2
```

```
cout<<*(a+1)<<"\n";//English
cout<<*a+1<<"\n"; //hysics
cout<<**(a+1)<<"\n";//E
cout<<*(a+1)+2<<"\n";//glish
cout<<*(*(a+1))+2<<"\n";//71
cout<<*(*(a+1)+2)<<"\n";//g
cout<<a+2<<"\n"; //0x8fc1fff4
cout<<*(a+2)<<"\n";//Computer
cout<<*a+2<<"\n";   //ysics
cout<<**(a+2)<<"\n"; //C
cout<<*(a+2)+3<<"\n";//puter
cout<<*(*(a+2))+3<<"\n";//70
cout<<*(*(a+2)+3)<<"\n";//p
}
```

Output given as comment along with each statement for the above program code

```
void main()
{clrscr();
int a[3][4]={10,20,30,40,100,200};
int (*p)[4]=a;
cout<< sizeof(a)<<"  "<<sizeof(p)<<"\n";
cout<<*a<<"  "<<*p<<"\n";
cout<<**a<<"  "<<**p<<"\n";
cout<<a+1<<"  "<<p+1<<"\n";
cout<<*(a+1)<<" "<<*(p+1)<<"\n";
cout<<**(a+1)<<"\n";
cout<<*(a+1)+2<<"\n";
cout<<*(*(a+1))+2<<"\n";
}
```

OUTPUT

```
24  2
0x8fd0ffde  0x8fd0ffde
10  10
0x8fd0ffe6  0x8fd0ffe6
0x8fd0ffe6 0x8fd0ffe6
100
0x8fd0ffea
102
```