

```
/*
A square matrix is having same number of rows and columns, is called a diagonal matrix if its
diagonal elements are non zero. A matrix is called upper triangular matrix if all the elements
below the diagonals are 0, and the lower triangular matrix if all the elements above the
diagonal are 0. Write a program that determines if a given matrix is one of these
*/
```

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
```

```
void main(){
int a[10][10], row, col, i, j, p=0, up=1, low=1;
while(1){
printf("enter row & column:\n");
scanf("%d%d", &row, &col);
if(row==col){
break;
}else{
printf("You have not Entered a square Matrix\n");
printf("Please Enter a square Matrix\n");
}
for(int i=0; i<row; i++){
for(int j=0; j<col; j++){
printf("Enter the value of position a[%d][%d]", i, j);
scanf("%d", &a[i][j]);
}
}
```

```
for(int i=0, p=0; ((i<row)&&(p==0)); i++){
for(int j=0; j<col; j++){
if(i!=j){
if(a[i][j]!=0){
p=1;
break;
}
}
}
}
```

```
if(p==0){
printf("It is a diagonal Matrix\n");
}else{
printf("It is not a diagonal Matrix\n");
}
}
```

```
if(p==1){
for(int i=0; i<row; i++){
for(int j=0; j<col; j++){
if(j>i){
if(a[i][j]!=0){
low=0;
break;
}
}
}
}
```

```
if(i>j){
if(a[i][j]!=0){
up=0;
break;
}
}
}
}
```

```
if(up==1){
printf("It is an upper triangular Matrix\n");
}else{
printf("It is not an upper triangular Matrix\n");
}
}
```

```
if(low==0){
printf("It is a lower triangular Matrix\n");
}else{
printf("It is not a lower triangular Matrix\n");
}
}
```