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**Question 11:**

The function `getarraysum(int * arr, int len)` is supported to calculate and return the sum of elements of the input array `arr` of length `len` (`len > 0`). The function compiles successfully but fails to return the desired result due to logical errors.

**Given Code:**

```
#include<stdio.h>
int getarraysum(int *,int);
int main()
{
    int n,*arr,index;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
        scanf("%d",&arr[index]);
    }
    printf("%d",getarraysum(arr,n));
    return 0;
}

int getarraysum(int *arr, int len)
{
    int sum = 0,i;
    for(i=0;i<len;i++)
    {
        sum+= arr[i];
    }
    return sum;
}
```

**Question:12**

The methods `GetDigitSum(intarr[])` of class `DigitSum` accepts an integers array `arr` it is supposed to calculate the sum of digits of the even of the smallest elements in the input array it returns 1 if the calculated sum is even and returns 0 otherwise However there is a compilation error in the code your task is to fix it so that the program works for all the input values Note The methods `getdigitSum` uses another method `getSum(int sum)` which returns the sum of the digits of the input number `num`

**Corrected Code:**

```
#include<stdio.h>
int getDigitSum(int *,int);
int getSum(int);
int main()
```

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```
{
    int n,*arr,index;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
        scanf("%d",&arr[index]);
    }
    printf("%d", getDigitSum(arr,n));
    return 0;
}
int getDigitSum(int *arr,int len)
{
    int result;
    int min,i;
    for(i=0,min=arr[0];i<len;i++)
    {
        if(arr[i]<min)
            min=arr[i];
    }
    result=getSum(min)
    if(result%2==0)
        return 1;
    else
        return 0;
}
int getSum(int num)
{
    //WRITE YOUR CODE HERE
    int rem,sum=0;
    while(num)
    {
        rem=num%10;
        sum+=rem;
        num/=10;
    }
    return sum;
}
```

### Question:13

**Code Approach:** For this question, you will need to correct the given implementation. We do not expect you to modify the approach or incorporate any additional library methods. Lisa always forgets her birthday which is on 5<sup>th</sup> july

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In order to help her we have function `CheckBirthDay(char *month,int day)` which takes day and month as inputs and returns 1 if its her birthday and returns a 0 otherwise The function compiles fine but to return desired results for some cases Your task to fix the code so but that it passes at test cases

15(1)

**TestCase 1;**

**Input**

**July 13**

**Expected Return Value:**

**0**

**TestCase 2:**

**Input**

**April 3**

**Expected Return Value:**

**0**

**Corrected Code:**

```
#include<stdio.h>
int checkBirthDay(char*,int);
int main()
{
    char inp[]="july";
    int day=5;
    if(checkBirthDay(inp,day)==1)
        printf("Yes");
    else
        printf("No");
    return 0 ;
}
int checkBirthDay(char* month,int day)
{
    if(strcmp(month,"july")==0 && (day ==5))
        return 1;
    else
        return 0;
}
```

**Question:14**

**Matrix Adding odd diagonal elements**

`int calculateMatrixSum(int m, int n, int mat[m][n])`

```
{
    //WRITE YOUR CODE HERE
    int i,j,sum=0,row=m,col=n;
    if(row>0 && col>0)
    {
```

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```
        for(i=0;i<row;i++)
        {
            for(j=0;j<col;j++)
            {
                if(i==j)
                {
                    if(mat[i][j]%2==0)
                        sum+=mat[i][j];
                }
            }
        }

    }

    return sum;
}
```

#### FOR WORKING OUT

```
#include<stdio.h>
int calculateMatrixSum(int m, int n, int **mat);
int main()
{
    int **mat,M,N,row,col;
    scanf("%d%d",&M,&N);
    mat=(int **)malloc(sizeof(int*)*M);
    for(row=0;row<M;row++)
    {
        mat[row]=(int *)malloc(sizeof(int*)*N);
    }
    for(row=0;row<M;row++)
        for(col=0;col<N;col++)
            scanf("%d",&mat[row][col]);
    printf("%d ",calculateMatrixSum(M,N,mat));
    return 0;
}

int calculateMatrixSum(int m, int n, int mat[m][n])
{
    //WRITE YOUR CODE HERE
    int i,j,sum=0,row=m,col=n;
    if(row>0 && col>0)
    {
        for(i=0;i<row;i++)
```

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```
        {
            for(j=0;j<col;j++)
            {
                if(i==j)
                {
                    if(mat[i][j]%2!=0)
                        sum+=mat[i][j];
                }
            }
        }
    }
    return sum;
}
```

#### **Question:15**

##### **Manchester Encoding**

```
#include<stdio.h>
int * Manchester(int *, int);
int main()
{
    int n,*arr,index;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
        scanf("%d",&arr[index]);
    }
    arr=Manchester(arr,n);
    for(index=0;index<n;index++)
    {
        printf("%d ",arr[index]);
    }
    return 0;
}

int * Manchester(int *arr, int len)
{
    //WRITE YOUR CODE HERE
    int i;
    int *res=(int *)malloc(sizeof(int)*len);
    res[0]=arr[0]; //res[0]=(arr[0]!=0);
```

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```
    for(i=1;i<len;i++)
        res[i]=arr[i]^arr[i-1];
    return res;
}
```

### **Question:16**

#### **Matrix Sum**

#### **Corrected Code:**

```
int MatrixSum(int m, int n, int mat[m][n])
{
    int i,j,sum=0;
    for(i=0;i<m;i++)
    {
        for(j=0;j<n;j++)
        {
            sum+=mat[i][j];
        }
    }
    return sum;
}
```

### **FOR WORKING OUT**

```
#include<stdio.h>
int MatrixSum (int m, int n, int **mat);
int main()
{
    int **mat,M,N,row,col;
    scanf("%d%d",&M,&N);
    mat=(int **)malloc(sizeof(int*)*M);
    for(row=0;row<M;row++)
    {
        mat[row]=(int *)malloc(sizeof(int*)*N);
    }
    for(row=0;row<M;row++)
        for(col=0;col<N;col++)
            scanf("%d",&mat[row][col]);
    printf("%d ", MatrixSum (M,N,mat));
    return 0;
}

int MatrixSum(int m, int n, int mat[m][n])
{
```

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```
int i,j,sum=0;
for(i=0;i<m;i++)
{
    for(j=0;j<n;j++)
    {
        sum+=mat[i][j];
    }
}
return sum;
}
```

**Question 17:**

**Replace all the elements of the array with the maximum element of array.**

**//WRITE DOWN YOUR CODE HERE**

```
#include<stdio.h>
int * maxReplace(int *, int);
int main()
{
    int n,*arr,index;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
        scanf("%d",&arr[index]);
    }
    arr=maxReplace(arr,n);
    for(index=0;index<n;index++)
    {
        printf("%d ",arr[index]);
    }
    return 0;
}

int * maxReplace(int *arr, int len)
{
    int i
    if(len>0)
    {
        int max=arr[0];
        for(i=1;i<len;i++)
        {
            if(max<arr[i])
```

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```
                max=arr[i];
            }
            for(i=0;i<len;i++)
                arr[i]=max;
        }
        return arr;
    }
}
```

**Question 18:**

**Find the number of occurrences of a given value in the array.**

**Corrected Code:**

```
#include<stdio.h>
int occurrence(int *, int,int);
int main()
{
    int n,*arr,index,val;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
        scanf("%d",&arr[index]);
    }
    scanf("%d",&val)
    printf("%d",occurrence(arr,n,val));
    return 0;
}

int occurrence(int *arr, int len,int value)
{
    int i=0,count=0;
    while(i<len)
    {
        if(arr[i]==value)
            count++;
        i++;
    }
    return count;
}
```

**Question 19:**

**The function patternPrint(int n) supposed to print n number of lines in the following pattern**

**For n=4 the pattern should be:**

**1**

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1 1  
1 1 1  
1 1 1 1

**The function complies successfully but fails to return the desired results due to logical errors Your task is to debug the program to pass all the test cases**

**Corrected Code:**

```
#include<stdio.h>
void patternPrint (int num);
int main()
{
    int n;
    scanf("%d",&n);
    patternPrint (n);
    return 0;
}

void patternPrint(int n)
{
    int print=1,i,j;
    for(i=0;i<n;i++)
    {
        for(j=0;j<=i;j++)
        {
            printf("%d",print);
        }
        printf("\n");
    }
}
```

**Question:20 The function removeElement(int \*arr,intlen,int index)takes an array arr of length len as an input. It is supposed to return an array len-1 after removing the integer at the given index in the input arrayarr. If the given index is out of bounds, then this function should return the input array arr. The function compiles successfully but fails to return the desired result due to logical errors \*/**

**WRITE YOUR CODE**

```
#include<stdio.h>
int * removeelement(int *, int,int);
int main()
{
    int n,*arr,index,rindex;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
```

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```
        scanf("%d",&arr[index]);
    }
    scanf("%d",&rindex);
    arr=removeelement(arr,n,rindex);
    for(index=0;index<n-1;index++)
    {
        printf("%d ",arr[index]);
    }

    return 0;
}
int* removeelement(int *arr, int len, int index)
{
    int *rarr;
    int i,j;
    if(index<len)
    {
        for(i=index;i<len-1;i++)
        {
            arr[i]=arr[i+1];
        }
        rarr=(int*)malloc(sizeof(int)*(len-1));
        for(i=0;i<len-1;i++)
            rarr[i]=arr[i];
        return rarr;
    }
    else
        return arr;
}
```

**Question:21 Replace a given array with zeros and ones depending on the even or odd criteria of the array length. //WRITE DOWN YOUR CODE HERE**

```
#include<stdio.h>
int * replaceValues(int *, int);
int main()
{
    int n,*arr,index;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
```

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```
        scanf("%d",&arr[index]);
    }
    arr=replaceValues(arr,n);
    for(index=0;index<n;index++)
    {
        printf("%d ",arr[index]);
    }

    return 0;

}
int *replaceValues(int *arr, int len)
{
    int i;
    for(i=0;i<len;i++)
        arr[i]=len%2;
    return arr;
}
```

**Question: 22 Selection Sort**

**Corrected Code:**

```
#include<stdio.h>
int * sortArray(int *, int);
int main()
{
    int n,*arr,index;
    scanf("%d",&n);
    arr=(int *)malloc(sizeof(int)*n);
    for(index=0;index<n;index++)
    {
        scanf("%d",&arr[index]);
    }
    arr=sortArray(arr,n);
    for(index=0;index<n;index++)
    {
        printf("%d ",arr[index]);
    }

    return 0;

}
int * sortArray(int *arr, int len)
{
    int x=0,y=0,n=len;
```

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```
int index_of_min, temp;
for(x=0;x<n;x++)
{
    index_of_min=x;
    for(y=x;y<n;y++)
    {
        if(arr[index_of_min]>arr[y])
        {
            index_of_min=y;
        }
    }
    temp = arr[x];
    arr[x] = arr[index_of_min];
    arr[index_of_min] = temp;
}
return arr;
}
```

**QUESTION:23**

**Return the difference between two given times in seconds**

**TESTCASE**

**TestCase1:**

**Input:**

**Time:1:58:42, Time:2:1:45**

**Expected Return values:**

**183**

**Testcase 2**

**Input:**

**Time:3:49:57, Time:2:45:57**

**Expected Return Values**

**3600**

```
#include<stdio.h>
struct Time
{
    int h;
    int m;
    int s;
};
typedef struct Time TIME;
toSeconds(TIME * gt)
{
    int in_seconds;
```

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```
        in_seconds = gt->h * 3600 + gt->m * 60 + gt->s;
        return in_seconds;
    }
int abs(int val)
{
    if (val< 0)
        return -val;
    else
        return val;
}

diff_in_times(TIME *t1, TIME *t2)
{
    //WRITE DOWN YOUR CODE HERE
    int t5,t6,res,result;
    t5= toSeconds(t1);
    t6= toSeconds(t2);
    res= t5-t6;
    result=abs(res);
    return result;
}

int main()
{
    TIME t1 = {1,58,42}, t2 = {2,59,45};
    printf("%d", diff_in_times(&t1, &t2));
    return 0;
}
```

**Question:24**

**Print the following Pattern**

1

1 2 1

1 2 3 2 1

1 2 3 4 3 2 1

**//WRITE DOWN YOUR CODE HERE**

```
#include<stdio.h>
void printPattern (int num);
int main()
{
    int n;
    scanf("%d",&n);
    printPattern (n);
    return 0;
}
```

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```
void printPattern(int n)
{
    int i,j;
    for(i=1;i<=n;i++,printf("\n"))
    {
        for(j=1;j<=i;j++)
        {
            printf("%d",j);
        }
        for(j--;j>=1;j--)
        {
            printf("%d",j);
        }
    }
}
```

**Or**

```
void printPattern(int n)
{
    int i,j,num=1;
    for(i=1;i<=n;i++)
    {
        num=num*10+1;
        printf("%d\n", num*num);
    }
}
```

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