C assignments – 26-Sept-2022 to 1-Oct-2022

Name – Shreyas Raju Awankar

All the questions are typed in comments of the code.

26-Sept-2022

```
// Write a program in C to accept two matrices and check wheather they are equal.
#include <stdio.h>
void main()
   int ra, rb, ca, cb;
   int i, j;
    int a[ra][ca];
   int b[rb][cb];
   int valueChecker = 1;
   printf("Enter how many rows you want in first matrix\n");
    scanf("%d", &ra);
   printf("Enter how many columns you want in first matrix\n");
    scanf("%d", &ca);
    printf("Enter how many rows you want in second matrix\n");
    scanf("%d", &rb);
   printf("Enter how many columns you want in second matrix\n");
   scanf("%d", &cb);
   if (ra == rb && ca == cb)
    {
        printf("Enter the element of the first matrix.\n");
        for (i = 0; i < ra; i++)
        {
            for (j = 0; j < ca; j++)
                printf("a[%d][%d] = ?\n", i, j);
                scanf("%d", &a[i][j]);
            }
        printf("\nEnter the elements of the second matrix.\n");
        for (i = 0; i < rb; i++)
            for (j = 0; j < cb; j++)
```

```
printf("b[%d][%d] = ?\n", i, j);
                scanf("%d", &b[i][j]);
            }
        for (i = 0; i < rb; i++)
            for (j = 0; j < cb; j++)
                if (a[i][j] != b[i][j])
                    valueChecker = 0;
            }
       if (valueChecker == 1)
            printf("Two entered matrices are equal.");
        else
            printf("Two entered matrices are not equal as their elements are not
equal");
   else
        printf("Two entered matrices are not equal since their sizes are not
same.");
```

```
// Write a program to convert a binary number into a decimal number.
#include <stdio.h>
void main(){
   int a,i,j,sum=0;
   printf("Enter your binary number\n");
   scanf("%d",&a);
   for (a, i=1; a>0; a/=10,i+=i ){
        if(a%10==1)
        sum+=i;
   }
   printf("The decimal of the entered binary number is %d\n", sum);
}
```

```
// Write a program to convert a binary number into a decimal number.
#include <stdio.h>
int power(int a, int b){
   int c=1;
    while(b>0){
       c *= 2;
       b--;
    return c;
void main(){
   int binArray[16];
    int a,i,j,sum=0;
    printf("Enter your binary number strictly in 16 bit format.\n");
    scanf("%d",&a);
    for (i=15, j=0; i>=0, j<15; i--,j++){}
        binArray[i]=a%10;
       if(a%10==1)
        sum+=power(2,j);
        a/=10;
    printf("The decimal of the entered binary number is %d\n", sum);
```

Que3.

```
// Write a program to convert a binary number into a decimal number using math
function.
#include <stdio.h>
#include <math.h>
void main()
{
    int binArray[16];
    int a, i, j, sum = 0;
    printf("Enter your binary number strictly in 16 bit format.\n");
    scanf("%d", &a);
    for (i = 15, j = 0; i >= 0, j < 15; i--, j++)
    {
        binArray[i] = a % 10;
        if (a % 10 == 1)
            sum += pow(2, j);
        a /= 10;</pre>
```

```
}
printf("The decimal of the entered binary number is %d\n", sum);
}
```

```
// Write a program to reverse a 1D array.
#include <stdio.h>
void main()
    int e, i, j;
    printf("How many elements you want in your array?\n");
    scanf("%d", &e);
    int array[e];
    int reversed_array[e];
    printf("Enter the array elements\n");
    for (i = 0; i < e; i++)
    {
        printf("array[%d] = ?\n",i);
        scanf("%d", &array[i]);
    // Reversing the array.
    for (i = e-1, j = 0; i >= 0, j <= e-1; i--, j++)
        reversed_array[j] = array[i];
    // Printing the reversed array.
    printf("The reversed array elements are\n");
   for (i = 0; i < e; i++)
    {
        printf("%d ", reversed_array[i]);
```

```
// Write a program to find the second largest element in an array.
#include <stdio.h>
void main()
    int e, i;
    printf("How many elements you want in your array?\n");
    scanf("%d", &e);
    int array[e];
    printf("Enter the array elements\n");
    for (i = 0; i < e; i++)
    {
        printf("array[%d] = ?\n", i);
        scanf("%d", &array[i]);
    int max1 = array[0];
    for (i = 0; i < e; i++)
        if (array[i] > max1)
            max1 = array[i];
    printf("%d ", max1);
    int max2 = -2147483648;
    for (i = 0; i < e; i++)
    {
        if (array[i] >= max2 && array[i] < max1)</pre>
        // if (array[i] >= max2 )
            max2 = array[i];
    printf("The second largest element in your array is %d ", max2);
```

```
// Write a program to find the second smallest element in an array.
#include <stdio.h>
void main()
{
```

```
int e, i;
printf("How many elements you want in your array?\n");
scanf("%d", &e);
int array[e];
printf("Enter the array elements\n");
for (i = 0; i < e; i++)
{
    printf("array[%d] = ?\n", i);
    scanf("%d", &array[i]);
int min1 = array[0];
for (i = 1; i < e; i++)
    if (array[i] < min1)</pre>
   {
        min1 = array[i];
// printf("%d ", min1);
int min2 = 2147483647;
for (i = 2; i < e; i++)
    if (array[i] <= min2 && array[i] > min1)
        min2 = array[i];
printf("The second smallest element in your array is %d ", min2);
```

27-Sept-2022

```
// Write a program to make a calculator using user defined functions.
#include <stdio.h>
#include <stdlib.h>
float adder(float x, float y)
{
    float d = x + y;
    return d;
}
float sub(float x, float y)
{
```

```
float d = x - y;
    return d;
float devider(float x, float y)
    float d = x / y;
    return d;
void main()
    char ch = 'y';
    do{
   float a, b;
    int choice;
    printf("Enter two numbers\n");
    scanf("%f%f", &a, &b);
    printf("Please enter the operation choice: \n 1 -> add \n 2 -> substract \n 3
-> devide \n 4 -> exit the program\n");
    scanf("%d", &choice);
    switch (choice)
    {
    case 1:
        printf("The addition of two numbers is %.2f\n", adder(a, b));
        break;
    case 2:
        printf("The substraction of two numbers is %.2f\n", sub(a, b));
        break;
        printf("The division of two numbers is %.2f\n", devider(a, b));
        break;
    case 4:
        exit(0);
    printf("Do you want to continue?[y/n]\n");
    scanf("%s",&ch);
    }while (ch != 'n');
```

```
// Write a menu driven program
// choice 1 : Check for perfect number.
// choice 1 : Check for palindrome number.
// choice 1 : Check for Armstrong number.
// Using functions.
// This program may not work in vs code for Armstrong number in VS code but it
worked on other online compilers
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
int perfect(int a)
    int sum = 0;
    for (int i = 1; i <= a / 2; i++)
        if (a \% i == 0)
            sum += i;
    if (sum == a)
        return 1;
    return 0;
int Armstrong(int a)
    int b = a, c, sum = 0, count = 0;
    c = a;
    while (c > 0)
        count++;
        c /= 10;
    while (a > 0)
        sum += pow(a % 10, count);
        a /= 10;
    if (sum == b)
        return 1;
    return 0;
```

```
int palindrome(int a)
    int reversed = 0, r, b = a;
    while (a > 0)
    {
        r = a \% 10;
        reversed = reversed * 10 + r;
        a /= 10;
    if (reversed == b)
        return 1;
    return 0;
void main()
    char option = 'y';
    do
    {
        int x, choice;
        printf("Enter a number\n");
        scanf("%d", &x);
    ABC:
        printf("Enter your choice\n 1 -> To check for a perfect number \n 2 -> To
check for an Armstrong number \n 3 -> To check for a palindrome number.\n");
        scanf("%d", &choice);
        switch (choice)
        {
        case 1:
            if (perfect(x) == 0)
                printf("The given number is not a perfect number.\n");
            else
                printf("The given number is a perfect number.\n");
            break;
        case 2:
            if (Armstrong(x) == 1)
                printf("The given number is an Armstrong number.\n");
                printf("The given number is not an Armstrong number.\n");
            break;
        case 3:
            if (palindrome(x) == 0)
                printf("The given number is not a palindrome number.\n");
            else
                printf("The given number is a palindrome number.\n");
```

```
break;
case 4:
    exit(0);
default:
    printf("Please enter the correct choice out of 1,2,3,4.\n");
    goto ABC;
}
printf("Do you want to continue?[y/n]\nAny thing except 'n' will be
treated as 'y' \n");
    scanf(" %c", &option);
} while (option != 'n');
}
```

```
// Write a program to create a function called prime and send any value from main
and check if the number is prime or not.
#include <stdio.h>
int prime(int a){
    for (int i = 2; i <= a/2; i++){
        if (a\%i == 0)
        return 0;
    return 1;
void main(){
    int k, 1;
    printf("Enter your number\n");
    scanf("%d", &k);
    1 = prime(k);
    if (1==1)
    printf("Entered number %d is prime\n", k);
    printf("Entered number %d is not prime\n", k);
```

28-Sept-2022

Que.1

```
// Write a program to pass the elements of an array to a function and check how
many numbers are prime.
#include <stdio.h>
int prime(int a)
{
    for (int i = 2; i <= a / 2; i++)
    {
        if (a % i == 0)
            return 0;
    }
    return 1;
}

void main()
{
    int a, count = 0;</pre>
```

```
printf("How many array elements do you want?\n");
    scanf("%d", &a);
    int arr[a];
    for (int i = 0; i < a; i++)
    {
        printf("a[%d]=? \n", i);
        scanf("%d", &arr[i]);
        if (prime(arr[i]) == 1)
            count++;
    }
    printf("There are %d prime elements in your array", count);
}</pre>
```

```
/* Write a program to pass an entire array in a function and square every element
at that array in called function and display that array in both the functions. */
#include <stdio.h>
void squar(int array[], int a)
    printf("\nArray elements in called functions are\n");
    for (int i = 0; i < a; i++)
        array[i] *= array[i];
        printf("%d ", array[i]);
#include <stdio.h>
void main()
    printf("How many elements you want in your array?\n");
    scanf("%d",&a);
    int array[a];
    for (int i = 0; i < a; i++)
        printf("array[%d] = ?\n", i);
        scanf("%d", &array[i]);
    squar(array, a);
    printf("\nThe array elements in calling function are\n");
```

```
for (int i = 0; i < a; i++)
{
    printf("%d ", array[i]);
}
</pre>
```

```
/* Write a program to pass an entire array in a function and square every element
at that array in called function and display that array in both the functions. */
#include <stdio.h>
void squar(int array[], int a)
    printf("\nArray elements in called functions are\n");
    for (int i = 0; i < a; i++)
        array[i] *= array[i];
        printf("%d ", array[i]);
#include <stdio.h>
void main()
    printf("How many elements you want in your array?\n");
    scanf("%d",&a);
    int array[a];
    for (int i = 0; i < a; i++)
    {
        printf("array[%d] = ?\n", i);
        scanf("%d", &array[i]);
    printf("The array elements in calling function are\n");
    for (int i = 0; i < a; i++)
    {
        printf("%d ", array[i]);
    squar(array, a);
```

```
// Write a program to pass only even index elements of an array to a function.
#include <stdio.h>
void evenPrinter(int a, int i)
    printf("\narray [%d] = %d \n", i, a);
void main()
    int a, i;
    printf("How many elements you want in your array?\n");
    scanf("%d", &a);
    int array[a];
    for (i = 0; i < a; i++)
        printf("array[%d] = ?\n", i);
        scanf("%d", &array[i]);
    for (i = 0; i < a; i++)
    {
        if (i % 2 == 0)
            evenPrinter(array[i], i);
```

29-Sept-2022

```
// Write a program in C to convert a decimal number to binary using
recursion.
#include <stdio.h>
int dec(int x){
   int c;
   c = x%2;
   if (x>1)
   dec(x/2);
   printf("%d", c);
}
```

```
void main(){
   int a,f;
   printf("Enter a decimal number\n");
   scanf("%d",&a);
   dec(a);
}
```

```
// Write a c program to check two given integers and return the value
whichever value is nearest to 13 without going over. Return 0 if both
numbers go over.
#include <stdio.h>
int nearest(int x, int y)
    if (x >= 13 \&\& y >= 13)
        return 0;
    else if (x < 13 \&\& y > 13)
    {
        int z = x, r = y, counter1 = 0, counter2 = 0;
        while (z <= 13)
        {
            counter1++;
            z++;
        while (r >= 13)
            counter2++;
            r--;
        if (counter1 < counter2)</pre>
            return x;
        else if (counter1 == counter2)
            return 2;
        else
            return y;
    else if (x > 13 \&\& y < 13)
```

```
int z = x, r = y, counter1 = 0, counter2 = 0;
        while (z >= 13)
        {
            counter1++;
            Z--;
        while (r \ll 13)
            counter2++;
            r++;
        if (counter1 < counter2)</pre>
            return x;
        else if (counter1 == counter2)
            return 2;
        else
            return y;
    }
void main()
    int a, b, near;
    printf("Enter two numbers\n");
    scanf("%d%d", &a, &b);
    near = nearest(a, b);
    if(nearest(a,b)!=0 && nearest(a,b)!=2)
    printf("The nearest number to 13 is %d ", near);
    else if (nearest(a,b)==2)
    printf("Both the numbers share the same distance from 13");
    else
    printf("Both the numbers go over 13");
```

```
// Write a program in C to count the digit in a given number using
recursion.
#include <stdio.h>
int counter(int x, int y){
   int c = x%10;
   if (x==0)
```

```
return 0;
else if (c == y)
return 1+counter(x/10,y);
else
return counter(x/10,y);
}
void main()
{
   int a,b, count;
   printf("Enter your number\n");
   scanf("%d", &a);
   printf("Enter your digit\n");
   scanf("%d", &b);
   count = counter(a,b);
   printf("The digit occured %d times",count);
}
```

```
// Write a program in C to convert a decimal number to binary using
recursion.
#include <stdio.h>
int dec(int x){
    int c;
    c = x%2;
    if (x>1)
    dec(x/2);
    printf("%d", c);
}
void main(){
    int a,f;
    printf("Enter a decimal number\n");
    scanf("%d",&a);
    dec(a);
}
```

```
// Write a c program to check two given integers and return the value whichever
value is nearest to 13 without going over. Return 0 if both numbers go over.
#include <stdio.h>
int nearest(int x, int y)
    if (x >= 13 \&\& y >= 13)
    {
        return 0;
    else if (x < 13 \&\& y > 13)
        if (13 - x < y - 13)
            return x;
        else if (13 - x == y - 13)
            return 2;
        else
            return y;
    else if (x > 13 \&\& y < 13)
        if (x - 13 < 13 - y)
            return x;
        else if (x - 13 == 13 - y)
            return 2;
        else
            return y;
    else
    {
        if (13 - x < 13 - y)
            return x;
        else if (x - 13 == 13 - y)
            return 2;
        else
            return y;
void main()
    int a, b, near;
    printf("Enter two numbers\n");
    scanf("%d%d", &a, &b);
    near = nearest(a, b);
```

```
if (nearest(a, b) != 0 && nearest(a, b) != 2)
    printf("The nearest number to 13 is %d ", near);
else if (nearest(a, b) == 2)
    printf("Both the numbers share the same distance from 13");
else
    printf("Both the numbers go over 13");
}
```

```
// WAP for power function using recursion..
#include <stdio.h>
int power(int a, int b)
{
    if (b == 0)
        return 1;
    else
        return a * power(a,b - 1);
}
void main()
{
    int a, b, pow;
    printf("Enter a number to make power of\n");
    scanf("%d", &a);
    printf("Enter the value which you want to power the number by\n");
    scanf("%d", &b);
    pow = power(a,b);
    printf("The power of %d by %d is %d", a, b, pow);
}
```

```
//Write a program to check if a triple is present in an array of integers or not.
If the vale appears three times in a row in an array is called triple.
#include <stdio.h>
void main(){
   int a,i,c=0;
   printf("How many elements you want in your array?\n");
   scanf("%d",&a);
   int array[a+2];
   for(i=0; i<a; i++){
      printf("array[%d]=?\n", i);
}</pre>
```

```
scanf("%d",&array[i]);
}
for(i=0; i<a; i++){
    if(array[i] == array[i+1] && array[i] == array[i+2]){
    c=1;
    printf("%d is present for 3 times contiguously.", array[i]);
    }
}
if (c==0)
printf("No element repeated for 3 times contiguously.");</pre>
```

1-Oct-2022

Que1.

```
// Write a program to read a character from user and print the character is
vowel, comsonent Or number...
#include <stdio.h>
void main()
{
    char c;
    printf("Enter an alphabet/digit:\n");
    scanf("%c", &c);
    if (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u' || c == 'A' || c
== 'E' || c == 'I' || c == 'O' || c == 'U')
    printf("\'%c\' is a vowel.", c);
    else if (c >= '0' && c<='9' )
    printf("\'%c\' is a number",c);
    else
        printf("\'%c\' is a consonant.", c);
}</pre>
```

Que2.

```
// Write a program to read a character from user and check ther character is
upper case Or lower case..
#include <stdio.h>
void main()
{
    char c;
    printf("Enter an alphabet:\n");
```

```
scanf("%c", &c);
if(c>='a' && c<='z')
printf("Entered alphabet is lowercase");
else if(c>='A' && c<='Z')
printf("Entered alphabet is uppercase");
else
printf("Entered character is not an alphabet");
}</pre>
```

Que3.

```
// Write a program to read a 2 character from user and multiply them...
#include <stdio.h>
void main()
   char ch1, ch2;
   int mul;
A:
   printf("Enter first character\n");
  scanf(" %c", &ch1);
  printf("Enter second character\n");
   scanf(" %c", &ch2);
   if (ch1 >= 48 \&\& ch1 <= 57 \&\& ch2 >= 48 \&\& ch2 <= 57)
      mul = (ch1 - 48) * (ch2 - 48);
      printf("The multiplication is %d\n", mul);
   }
   else
      printf("The input character should range between 0-9\n");
      goto A;
```

Que4.

```
// Write a program to read a string from user and display only vowels...
#include <stdio.h>
void main()
{
    char str[20];
    printf("Enter your string\n");
    gets(str);
    printf("The vovels in the string are\n");
```

```
for(int i=0; i<20; i++){
  if(str[i]=='a' || str[i]=='e' || str[i]=='i' || str[i]=='o' || str[i]=='u' ||
  str[i]=='A' || str[i]=='E' || str[i]=='I' || str[i]=='0' || str[i]=='U')
  printf("%c ", str[i]);
  }
}</pre>
```

Que5.

```
// Write a program to read a string from user and display the count of vovels and
consonents...
#include <stdio.h>
void main()
   char str[20];
   int c1=0,c2=0;
   printf("Enter your string\n");
   gets(str);
   for(int i=0; i<20; i++){
  if(str[i]=='a' || str[i]=='e' || str[i]=='i' || str[i]=='o' || str[i]=='u' ||
str[i]=='A' || str[i]=='E' || str[i]=='I' || str[i]=='0' || str[i]=='U')
   c1++;
  else if(str[i]=='\0')
  break;
  else if(str[i]!=' ')
  c2++;
   printf("The vovels in the string are : %d\n", c1);
   printf("The consonents in the string are : %d", c2);
```

Que6.

```
// Write a program to pass every element of 2D array to a function and
print only those elements which are prime. Read elements from the user.
#include <stdio.h>
void primechecker(int a){
   int shivgami = 1;
   for(int i = 2;i<=a/2;i++){
        if(a%i==0){
        shivgami=0;
        break;
     }
}</pre>
```

```
if(shivgami ==1 && a!=1)
    printf("%d ",a);
void main(){
   int r,c;
    printf("Enter the number of rows in your array?\n");
    scanf("%d", &r);
   printf("Enter the number of columns in your array?\n");
    scanf("%d", &c);
    int array[r][c];
    for(int j = 0; j < r; j++){
        for (int k = 0; k < c; k++){
            printf("Array[%d][%d]?\n",j,k);
            scanf("%d", &array[j][k]);
        }
    printf("The prime elements in the array are.\n");
    for(int j = 0; j < r; j++){
        for (int k = 0; k < c; k++){
            primechecker(array[j][k]);
    }
```

Que7.

```
// Write a program to pass every element of 2D array to a function and
five count of even and odd numbers.
#include <stdio.h>
static int c1, c2;
void checker(int x)
{
    // c1 = 0, c2 = 0;
    if (x % 2 == 0)
        c1++;
    else
        c2++;
}

void main()
{
    int r, c;
```

```
static int count1 = 0, count2 = 0;
printf("Enter the number of rows in your array?\n");
scanf("%d", &r);
printf("Enter the number of columns in your array?\n");
scanf("%d", &c);
int array[r][c];
for (int j = 0; j < r; j++)
{
    for (int k = 0; k < c; k++)
        {
        printf("Array[%d][%d]?\n", j, k);
        scanf("%d", &array[j][k]);
        checker(array[j][k]);
    }
}
printf("The even elements are %d \n", c1);
printf("The odd elements are %d \n", c2);
}</pre>
```

Que8.

```
scanf("%d", &r);
printf("Enter the number of columns in your array?\n");
scanf("%d", &c);
int array[r][c];
for (int j = 0; j < r; j++)
{
    for (int k = 0; k < c; k++)
    {
        printf("array[%d][%d]=?\n",j,k);
        scanf("%d", &array[j][k]);
}
cube(array);
printf("\nThe array elements in calling function are\n");
for (int j = 0; j < r; j++)
{
    for (int k = 0; k < c; k++)
        printf("%d ", array[j][k]);
```

Que9.

```
else
                return 1;
void main()
    printf("Enter the number of rows in your array1?\n");
    scanf("%d", &ra);
    printf("Enter the number of columns in your array2?\n");
    scanf("%d", &ca);
    printf("Enter the number of rows in your array1?\n");
    scanf("%d", &rb);
    printf("Enter the number of columns in your array2?\n");
    scanf("%d", &cb);
    int array1[ra][ca];
    int array2[rb][cb];
    if (ra == rb && ca == cb)
        printf("\nEnter the elements of the array1\n");
        for (int j = 0; j < ra; j++)
        {
            for (int k = 0; k < ca; k++)
            {
                printf("array1[%d][%d]=?\n", j, k);
                scanf("%d", &array1[j][k]);
        printf("\nEnter the elements of the array2\n");
        for (int j = 0; j < rb; j++)
        {
            for (int k = 0; k < cb; k++)
                printf("array2[%d][%d]=?\n", j, k);
                scanf("%d", &array2[j][k]);
        }
        if (equalChecker(array1, array2) == 1)
            printf("Both the arrays are equal.");
        else
            printf("Two entered matrices are not equal as their elements
are not equal."):
```

```
else
    printf("Two entered matrices are not equal since their sizes are
not same.");
}
```