C Programming (Projects)

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Post Graduate Diploma in Information Technology

by

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Question 1 Perform the following operations on integer array of 10 elements. Accept the values from user.
1.   Sort an array in ascending order.
2.   Display sum of all odd values stored in an array.
3.   Display number of even values stored in an array.

Answer 1
Code:

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

  /* Function prototype for recursive compare function */
  int intcmp(const void *v1,const void *v2);

  int sumOdd(int arr[],int n); /* Function prototype for Sum of Odd numbers */

  int evenNo(int arr[], int n); /* Function prototype for getting Number of Even
numbers */

  main(void)

  {

  int arr[10],a,b,c,d,e,f,g,h,i,j,k,count,sum,num;/* define variable to store user
input */

  clrscr(); /*Clear screen*/

  printf("Enter array values for: 1)Sort asc 2)Get Sum of Odd numbers 3) Get Number
of Even    Nos. \n");
  printf("-------------------------------------------------------\n");

  scanf("%d\n",&a);
  scanf("%d\n",&b);
  scanf("%d\n",&c);
  scanf("%d\n",&d);
  scanf("%d\n",&e);
  scanf("%d\n",&f);
```

```c
    scanf("%d\n",&g);
    scanf("%d\n",&h);
    scanf("%d\n",&i);
    scanf("%d",&j);

    printf("--------------------------------------------------------\n");
    arr[0] =a; /* Assign entered values to local array */
    arr[1] =b;
    arr[2] =c;
    arr[3]=d;
    arr[4]=e;
    arr[5]=f;
    arr[6]=g;
    arr[7]=h;
    arr[8]=i;
    arr[9]=j;
    printf("Original entered values\n");

    printf("%d\t",arr[0]); /* Print entered values values */
    printf("%d\t",arr[1]);
    printf("%d\t",arr[2]);
    printf("%d\t",arr[3]);
    printf("%d\t",arr[4]);
    printf("%d\t",arr[5]);
    printf("%d\t",arr[6]);
    printf("%d\t",arr[7]);
    printf("%d\t",arr[8]);
    printf("%d\t",arr[9]);

    /* Unformatted String output to press any key to sort */
    puts("Press a key to sort Numbers in Ascending Order\n");

    getch(); /* Wait for user input */

    /* Invoke Quick sort function passing the array having the values to be sorted along
with     other required data like Size and recursive function to be called*/

    qsort(arr,10,sizeof(arr[0]),intcmp);

    printf("----- Sorted Array in Ascending Order ----\n");
    for(count=0;count < 10;count++) /* loop until end of array and print the Sorted
```

```c
array */
    printf("arr[%d]=%d\t", count,arr[count]);

    printf("\n");

    /* Unformatted String output to press any key to get the Sum of odd numbers */
    puts("press key to get Sum of Odd\n");
    getch();  /* Wait for user input */

    /* Call function to get the Number of Odd numbers on array , pass array */
    sum = sumOdd(arr,10);

    printf("-------- Sum of Odd Values -------\n");
    printf("Sum of odd values : %d\n",sum); /* Display the Sum of the Odd numbers*/
    getch();  /* Wait for user input */

    printf("\n");

    /* Unformatted String output to press any key to ge the Number of even numbers*/
    puts("Press any key to get Number of even Numbers\n");

    getch(); /* Wait for user input */

    /*Call the function to get number of even numbers passing the array with data*/
    num = evenNo(arr,10);

    printf("------- Number of Even Numbers ------\n");
    printf("Number of Even Numbers : %d\n",num);/* Display the Number of Even
numbers*/
    getch();

    }

    /* Compare the 2 integer values and return the required number for the Qsort
algorithm*/

    int intcmp(const void *v1,const void *v2)
    {
    return (*(int *)v1 - *(int *)v2);
    }
```

```c
/* This function computes the Sum of Odd numbers, this is a Recursive function */

int sumOdd(int arr[],int n)
{
if(n==0)
return 0;
else

   {
     int smallResult =sumOdd(arr,n-1);
     if(arr[n-1] %2 ==1)
         return smallResult +arr[n-1];
          else
          return smallResult;
   }
}

/* This function computes the Number of Even numbers */
int evenNo(int arr[], int n)
{
if(n==0)
return 0;

else
    {
      int smallResult =evenNo(arr,n-1);
      if(arr[n-1] %2 ==0)
      return smallResult+1;
       else
   return smallResult;
   }
}
```

Question 2 Write a program for the following

1.   A file name is command line argument. Display the contents of the file where each word will be displayed on a new line. Display proper message if file does not exist.
2.   Display no. of ovals stored in the file.
3.   Display no. of "the" stored in the file.
4.   Copy contents of the file to another file.

Answer 2
Code:

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

display(FILE *f); /* Function prototype for displaying content of file */

numofvowels(FILE *f); /* Function prototype for getting the Number of Vowels */

/* Function prototype for searching the specified pattern in file */
look_in(FILE *f,char *pat);

/* Function prototype for copying contents to new file */
filecopy(FILE *f, char out_name[25]);

main()
{

FILE *file; /* Define FILE pointer variable */

int j,action; /* Define variables to get user action */
int ch;

/* Specific the search string as "the" as specified by question*/
char *search_string = "the";
```

```c
    char out_file[25];
    clrscr(); /* Clear screen */

    file = fopen("fscanf.txt", "r");/* Open the provided file called as "fscanf.txt" */

    if(file == NULL)
    {
    printf("Error : cant open file\n"); /* Display error if specified file is not present */
    return 1;
    }
        else
         {
        printf("File opened succesfully\n");
          }

    /* Display to User a selection list so that he/she can do the task */
    printf(" Enter desired Number, 1 - Display content,2- Num of Vowels,3-Num of the,
4-Copy\n");

    scanf("%d",&action);/* Obtain the user's choice of task */
    printf("%n");

    switch(action) /* Select a suitable action based on user's requirement using Switch
*/
    {
    case 1:
    printf("File content\n");

    /* Call function to display the contents of the file, passing the file variable */
    display(file);
    break;

    case 2:
    /* Call function to obtain the number of Vowels in the file, passing file as
argument */
    numofvowels(file);
    break;

    case 3:
    /* Call function to search the provided string in the specified file,passing file and
    search string  as arguments */
```

```c
      look_in(file,search_string);
      break;

      case 4:
      /* Call standard file copy function passing the file pointer and the user provided
file   name */
      filecopy(file,out_file);
      break;

      }


      fclose(file); /* Close the file*/
      getch(); /* Pause for User */
      return 0;
      }

      /* Function for displaying content of file */
      display(FILE *f)
      {
      char word[100];
      /* scan file and  dump the contents word by word to console */
      while(fscanf(f,"%s",word)!=EOF)
         {
         printf("%s\n",word);
         }
      }

      /* Function for getting the Number of Vowels */
      numofvowels(FILE *f)
      {
      int ch=0,a=0,e=0,i=0,o=0,u=0; /* define variable to hold vowel count */

      ch =getc(f); /* read char from file */

      while(ch !=EOF) /* check for End of File character and loop till it is encountered */
      {

      /* Check for existence of the vowels a,e i, o, u and increment the corresponding
count */
```

```c
if(ch == 'a')
a++;

if(ch == 'e')
e++;

if(ch == 'i')
i++;

if(ch == 'o')
o++;

if(ch == 'u')
u++;

ch = getc(f); /* Read Next character from file */
}

printf("------ Results for Vowel ---------\n");
printf("No of a: %d \n", a);
printf("No of e: %d \n",e);
printf("No of i: %d \n", i);
printf("No of o: %d \n", o);
printf("No of u: %d  \n",u);

printf("Total Vowels in file %d\n", a+e+i+o+u); /* Display the toal Vowel count */
}


/* Function for searching the specified pattern in file */
look_in(FILE *f,char *pat)
{
char line[2][100]; /* variable to store LINE by LINE */
int lineno =0; /* variable to keep track of Line count */
int matches =0; /* variable to keep track of the pattern */


while(fgets(line[0],100,f))  /* Read Line by Line from file till End of file */
{
char *line_to_use = line[0]; /* Current line under search test */
```

```c
    lineno++; /* Increment Line count */

    if(strstr(line_to_use,pat)) /* use standard string search inside a string */
    matches++; /* Increment Number of Matches  if match is found */
    }

    printf("Num of matches %d\n", matches); /* Display to user the Number of matches
*/
    }


    /* Function for copying contents to new file */
    filecopy(FILE *f, char out_name[25])
    {
    FILE * out_file; /* File poibnter variable */
    int c;

    /* Open output file, here it is opened if no such file exists */
    out_file = fopen("out_file.txt","w+");

    if(out_file == NULL)
    /* If unable to open file due to permission or so then print error */
    printf("cant open %s for writing\n",out_name);

      else
       {
          while((c = getc(f))!=EOF) /* read all data from current file */
          putc(c,out_file); /* write all data to new file */
      printf("File copied successfully\n");

      }
   }
```

I/P:

To test the File use the Input file in current directory with name "fscanf.txt" with
below content:

I am the
Vijay one

File copied is named as "OUT_FILE.txt", is created in same current directory and has original file contents as below:

O/P:

I am the
Vijay one