Homework 3 Solution

HW Arrays

EX1: Example of Multidimensional Array In C

```
#include <stdio.h>
int main(){
   float a[2][2], b[2][2], c[2][2];
   int i,j;
   printf("Enter the elements of 1st matrix\n");
/* Reading two dimensional Array with the help of two for loop. If there was
an array of 'n' dimension, 'n' numbers of loops are needed for inserting data
to array.*/
   for(i=0;i<2;++i)
       for(j=0;j<2;++j){
       printf("Enter a%d%d: ",i+1,j+1);
       scanf("%f",&a[i][j]);
       }
   printf("Enter the elements of 2nd matrix\n");
   for(i=0;i<2;++i)
       for(j=0;j<2;++j){
       printf("Enter b%d%d: ",i+1,j+1);
       scanf("%f",&b[i][j]);
       }
   for(i=0;i<2;++i)
       for(j=0;j<2;++j){
/* Writing the elements of multidimensional array using loop. */
       c[i][j]=a[i][j]+b[i][j];  /* Sum of corresponding elements of two
arrays. */
       }
   printf("\nSum Of Matrix:");
   for(i=0;i<2;++i)
       for(j=0;j<2;++j){
       printf("%.1f\t",c[i][j]);
           if(j==1)             /* To display matrix sum in order. */
              printf("\n");
      }
return 0;
}
```

EX2: C Program to Calculate Average Using Arrays

```
#include <stdio.h>
int main(){
    int n, i;
    float num[100], sum=0.0, average;
    printf("Enter the numbers of data: ");
    scanf("%d",&n);
    while (n>100 || n<=0)
    {
        printf("Error! number should in range of (1 to 100).\n");
        printf("Enter the number again: ");
        scanf("%d",&n);
    }
   for(i=0; i<n; ++i)
   {
      printf("%d. Enter number: ",i+1);
      scanf("%f",&num[i]);
      sum+=num[i];
   }
   average=sum/n;
   printf("Average = %.2f",average);
   return 0;
}
```

EX3: C Program to Find Transpose of a Matrix

```c
#include <stdio.h>
int main()
{
    int a[10][10], trans[10][10], r, c, i, j;
    printf("Enter rows and column of matrix: ");
    scanf("%d %d", &r, &c);

/* Storing element of matrix entered by user in array a[][]. */
    printf("\nEnter elements of matrix:\n");
    for(i=0; i<r; ++i)
    for(j=0; j<c; ++j)
    {
        printf("Enter elements a%d%d: ",i+1,j+1);
        scanf("%d",&a[i][j]);
    }
/* Displaying the matrix a[][] */
    printf("\nEntered Matrix: \n");
    for(i=0; i<r; ++i)
    for(j=0; j<c; ++j)
    {
        printf("%d  ",a[i][j]);
        if(j==c-1)
            printf("\n\n");
    }

/* Finding transpose of matrix a[][] and storing it in array trans[][]. */
    for(i=0; i<r; ++i)
    for(j=0; j<c; ++j)
    {
       trans[j][i]=a[i][j];
    }

/* Displaying the transpose,i.e, Displaying array trans[][]. */
    printf("\nTranspose of Matrix:\n");
    for(i=0; i<c; ++i)
    for(j=0; j<r; ++j)
    {
        printf("%d  ",trans[i][j]);
        if(j==r-1)
            printf("\n\n");
    }
    return 0;
}
```

EX4: C Program to Insert an element in an Array

```
#include<stdio.h>

int main() {
   int arr[30], element, num, i, location;

   printf("\nEnter no of elements :");
   scanf("%d", &num);

   for (i = 0; i < num; i++) {
      scanf("%d", &arr[i]);
   }

   printf("\nEnter the element to be inserted :");
   scanf("%d", &element);

   printf("\nEnter the location");
   scanf("%d", &location);

   //Create space at the specified location
   for (i = num; i >= location; i--) {
      arr[i] = arr[i - 1];
   }

   num++;
   arr[location - 1] = element;

   //Print out the result of insertion
   for (i = 0; i < num; i++)
      printf("n %d", arr[i]);

   return (0);
}
```

EX5: C Program to Search an element in Array

```
#include<stdio.h>

int main() {
   int a[30], ele, num, i;

   printf("\nEnter no of elements :");
   scanf("%d", &num);

   printf("\nEnter the values :");
   for (i = 0; i < num; i++) {
      scanf("%d", &a[i]);
   }

   //Read the element to be searched
   printf("\nEnter the elements to be searched :");
   scanf("%d", &ele);

   //Search starts from the zeroth location
   i = 0;
   while (i < num && ele != a[i]) {
      i++;
   }

   //If i < num then Match found
   if (i < num) {
      printf("Number found at the location = %d", i + 1);
   } else {
      printf("Number not found");
   }

   return (0);
}
```

HW: Strings

Ex1: C Program to Find the Frequency of Characters in a String

```
#include <stdio.h>
int main(){
   char c[1000],ch;
   int i,count=0;
   printf("Enter a string: ");
   gets(c);
   printf("Enter a character to find frequency: ");
   scanf("%c",&ch);
   for(i=0;c[i]!='\0';++i)
   {
       if(ch==c[i])
           ++count;
   }
   printf("Frequency of %c = %d", ch, count);
   return 0;
}
```

EX2: C Program to Find the Length of a String

```
#include <stdio.h>
int main()
{
    char s[1000],i;
    printf("Enter a string: ");
    scanf("%s",s);
    for(i=0; s[i]!='\0'; ++i);
    printf("Length of string: %d",i);
    return 0;
}
```

EX3: C Program to Reverse String Without Using Library Function

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

int main() {
   char str[100], temp;
   int i, j = 0;

   printf("\nEnter the string :");
   gets(str);

   i = 0;
   j = strlen(str) - 1;

   while (i < j) {
      temp = str[i];
      str[i] = str[j];
      str[j] = temp;
      i++;
      j--;
   }

   printf("\nReverse string is :%s", str);
   return (0);
}
```