



Name: Khizar Ali

Roll No: 22P-9269

Subject: Programing Fundamentals LAB

Submitted to: Muhammad Usman

Problem 1: Union of two sets

```
#include <stdio.h>
void findunion(int array1[], int array2[], int size1, int size2)
{
    int i, j, k = 0;
    int array3[100]={0};

    for (i = 0; i < size1; i++)
    {
        for (j = 0; j < size2; j++)
        {
            array3[k] = array1[i];
            k++;
            array3[k] = array2[j];
            k++;
        }
    }

    for (i = 0; i < k; i++)
    {
        for (j = 0; j < k - 1; j++)
        {
            if (array3[j] > array3[j+1])
            {
                int temp = array3[j];
                array3[j] = array3[j+1];
                array3[j +1 ] = temp;
            }
        }
    }

    printf("Union of the array is : \n");
    for (i = 0; i < k; i++)
    {
        int flag = 0;
        for (j = 0; j < i; j++)
        {
            if (array3[i] == array3[j])
            {
                flag = 1;
                break;
            }
        }

        if (flag == 0)
        {
            printf("%d ", array3[i]);
        }
    }
}
```

```

    }
}

int main()
{
    int array1[] = {1, 2, 3, 4, 5, 6, 3, 2};
    int array2[] = {1, 3, 5, 7};
    int size1 = 8;
    int size2 = 4;
    findunion(array1, array2, size1, size2);
    return 0;
}

```

Output:

```

PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> gcc 1.c
PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> ./a.exe
Union of the array is :
1 2 3 4 5 6 7
PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> 

```

Problem 2: Matrix Multiplication.

```

#include<stdio.h>

int main()
{
    int a[10][10], b[10][10], r1, c1, r2, c2, i, j, k;
    int result[10][10]={0};
    printf("Enter rows for first matrix: \n");
    scanf("%d",&r1);
    printf("Enter Column for first matrix: \n");
    scanf("%d",&c1);
    printf("Enter rows for second matrix: \n");
    scanf("%d",&r2);
    printf("Enter Column for second matrix: \n");
    scanf("%d",&c2);

    // If column of first matrix is not equal to row of second matrix,
    if (c1!=r2)
    {
        printf("Matrix cannot be multiplied");
    }
}

```

```

// Storing elements of first matrix.
else
{
    printf("\nEnter elements of matrix 1:\n");
    for(i=0; i<r1; i++)
        for(j=0; j<c1;j++)
        {
            scanf("%d", &a[i][j]);
        }

    // Storing elements of second matrix.
    printf("\nEnter elements of matrix 2:\n");
    for(i=0; i<r2; i++)
    {
        for(j=0; j<c2;j++)
        {
            scanf("%d",&b[i][j]);
        }
    }

    // Displaying matrices a and b
    printf("Matrix 1 is \n ") ;
    for(i=0; i<r1; i++)
    { for(j=0; j<c1; j++)
        {
            printf("%d \t",a[i][j]);
        }
        printf("\n");
    }
    printf("Matrix 2 is \n ");
    for(i=0; i<r1;i++)
    { for(j=0; j<c1; j++)
        {
            printf("%d \t",b[i][j]);
        }
        printf("\n");
    }

    // Multiplying matrices a and b & storing result in result matrix
    for(i=0; i<r1; i++)
    { for(j=0; j<c2; j++)
        {
            for(k=0; k<c1; ++k)
            {
                result[i][j]=result[i][j]+a[i][k]*b[k][j];
            }
        }
    }

    // Displaying the result
    printf("\nOutput Matrix:\n");
    for(i=0; i<r1; i++)

```

```

    { for(j=0; j<c2; ++j)
      {
          printf("%d \t ", result[i][j]);
      }
      printf("\n");
    }
    return 0;
}

```

OUTPUT

If number of rows and columns are not equal:

```

PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> gcc 2.c
PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> ./a.exe
Enter rows for first matrix:
3
Enter Column for first matrix:
3
Enter rows for second matrix:
2
Enter Column for second matrix:
2
Matrix cannot be multiplied

```

When Number of rows and column are equal:

```

Enter rows for first matrix:
2
Enter Column for first matrix:
2
Enter rows for second matrix:
2
Enter Column for second matrix:
2

Enter elements of matrix 1:
1
2
3
4

Enter elements of matrix 2:
1
2
3
4
Matrix 1 is
1    2
3    4
Matrix 2 is
1    2
3    4

Output Matrix:
7    10
15   22

```

Problem 3: GPA Calculator

```
#include<stdio.h>
#include<string.h>
int main()
{
    float points=0,total=0,GPA, credithour=0,totalhour=0;
    char grade[10];
    int subjects;
    printf("Enter Number of subjects ");
    scanf("%d",&subjects) ;
    for(int i= 1; i<=subjects;i++)
    {
        printf("Enter your grade in subject (%d) \n",i );
        scanf("%s",grade);
        printf("Enter your Credit hour of subject (%d) \n",i);
        scanf("%d",&credithour);
        totalhour=totalhour+credithour;
        if ( strcmp(grade,"A" ) == 0 )
        {
            points=4.0;
        }
        else if (strcmp (grade , "A-")==0)
        {
            points=3.67;
        }
        else if (strcmp (grade , "B+")==0)
        {
            points=3.33;
        }
        else if (strcmp (grade , "B")==0)
        {
            points=3.0;
        }
        else if(strcmp (grade , "B-")==0)
        {
            points=2.67;
        }
        else if (strcmp (grade , "C+")==0)
        {
            points=2.33;
        }
        else if (strcmp (grade , "C")==0)
        {
            points=2.0;
        }
        else if (strcmp (grade , "C-")==0)
```

```

    {
        points=1.67;
    }
    else if (strcmp (grade , "D+")==0)
    {
        points=1.33;
    }
    else if (strcmp (grade , "D")==0)
    {
        points=1.00;
    }
    else if (strcmp (grade , "F")==0)
    {
        points=0;
    }

    total=total+points*credithour;
}
GPA=total/totalhour;
printf("Your GPA is %.2f ",GPA);
return 0;
}

```

Output:

```

PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> gcc 3.c
PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> ./a.exe
Enter Number of subjects 4
Enter your grade in subject (1)
A-
Enter your Credit hour of subject (1)
3
Enter your grade in subject (2)
B+
Enter your Credit hour of subject (2)
2
Enter your grade in subject (3)
C-
Enter your Credit hour of subject (3)
3
Enter your grade in subject (4)
B-
Enter your Credit hour of subject (4)
1
Your GPA is 2.89
PS C:\Users\p22-9269\Desktop\Assignment 3\Assignment 3> █

```

Problem 4: Restaurant Menu

```
#include<stdio.h>
#include<string.h>
int menu1()
{ char size;
int input=0,total=0,price=0;
printf(".....espresso & mocha chiller:.....\n");
    printf("1. Very vanilla Chiller:\n price: small=361 regular= 409 \n");
    printf("2. Coco Locd: \n price: small=361 regular= 409 \n");
    printf("3. Cookies n cream:\n price: small=361 regular= 409 \n");
    printf("4. HAZELNUT MOCHA CHILLER:\n Price:  small= 396  regular= 461\n");
    printf("5. CHOCOLATE MACADAMIA CHILLER:\n Price:  small= 396  regular= 461\n");
    printf("6. ITALIAN DOLCE CHILLER:\n Price:  small= 396 regular= 461\n");
    printf("7. CARAMEL NUT CHILLER:\n Price:  small= 396  regular= 461\n");
    printf("8. TIRAMISU CHILLER:\n Price:  small= 399 regular= 509\n");
    printf("9. TOFFEE NUT CHILLER:\n Price:  small= 399 regular= 509\n");
    printf("Enter R for regular and S for small \n");
    scanf("\n %c",&size);
    printf("Choose the Number \n ");
    scanf("\n%d",&input);
    if(input==1 && size=='R' || size=='r')
    {
        price=409;
        total=total+price;
    }
    else if((input==1 && size=='S' || size=='s'))
    {
        price=361;
        total=total+price;
    }
    else if((input==2 && size=='R' || size=='r'))
    {
        price=409;
        total=total+price;
    }
    else if((input==2 && size=='S' || size=='s'))
    {
        price=361;
        total=total+price;
    }
    else if((input==3 && size=='R' || size=='r'))
    {
        price=409;
        total=total+price;
    }
    else if((input==3 && size=='S' || size=='s'))
    {
        price=361;
        total=total+price;
    }
```



```
}  
    else if((input==4 && size=='S' || size=='s'))  
    {  
        price=396;  
        total=total+price;  
    }  
    else if((input==4 && size=='R' || size=='r'))  
    {  
        price=461;  
        total=total+price;  
    }  
    else if((input== 5 && size=='S' || size=='s'))  
    {  
        price=396;  
        total=total+price;  
    }  
    else if((input==5 && size=='R' || size=='r'))  
    {  
        price=461;  
        total=total+price;  
    }  
    else if((input==6 && size=='S' || size=='s'))  
    {  
        price=396;  
        total=total+price;  
    }  
    else if((input==6 && size=='R' || size=='r'))  
    {  
        price=461;  
        total=total+price;  
    }  
    else if((input==7 && size=='S' || size=='s'))  
    {  
        price=396;  
        total=total+price;  
    }  
    else if((input==7 && size=='R' || size=='r'))  
    {  
        price=461;  
        total=total+price;  
    }  
    else if((input==8 && size=='S' || size=='s'))  
    {  
        price=399;  
        total=total+price;  
    }  
    else if((input==8 && size=='R' || size=='r'))  
    {  
        price=509;  
        total=total+price;  
    }
```

```

    }
    else if((input== 9&& size=='S' || size=='s'))
    {
        price=399;
        total=total+price;
    }
    else if((input==9 && size=='R' || size=='r'))
    {
        price=509;
        total=total+price;
    }
    return total;
}

int menu2()
{ char size;
int input=0,total=0,price=0;
printf(".....Over Ice..... \n");
printf("1. SIGNATURE ICED COFFEE \n price: small=300 regular= 374 \n");
printf("2. ICED MOCHA : \n price: small=300 regular= 361 \n");
printf("3. ICED CARAMEL LATTE:\n price: small=378 regular= 430 \n");
printf("4. ICED AMERICAND: \n Price:  small= 252  regular= 274\n");
printf("5. BLUEBERRY LEMONADE: \n Price:  small= 250  regular= 291 \n");
printf("6. LYCHEE LEMONADE: \n Price:  small= 250  regular= 291\n");
printf("7. GREEN APPLE LEMONADE:\n Price:  small= 250  regular= 291\n");
printf("8. PEACH LEMONADE:\n Price: small= 250  regular= 291\n");
printf("9. APPLE SODA:\n Price:  small= 335 regular= 348\n");
printf("10. LIME SODA:\n Price:  small= 335 regular= 361\n");
printf("11. ICED TEAS (Peach/Lemon Lycheel:\n Price:  small= 239  regular= 291 \n
");

printf("Enter R for regular and S for  small \n");
scanf("\n%c",&size);
printf("Choose  the Number \n ");
scanf("\n%d",&input);
if(input==1 && size=='R' || size=='r')
{
    price=374;
    total=total+price;
}
else if((input==1 && size=='S' || size=='s'))
{
    price=300;
    total=total+price;
}
else if((input==2 && size=='R' || size=='r'))
{
    price=361;
    total=total+price;
}
else if((input==2 && size=='S' || size=='s'))
{

```

```
    price=300;
    total=total+price;
}
else if((input==3 && size=='R' || size=='r'))
{
    price=430;
    total=total+price;
}
else if((input==3 && size=='S' || size=='s'))
{
    price=378;
    total=total+price;
}
else if((input==4 && size=='S' || size=='s'))
{
    price=252;
    total=total+price;
}
else if((input==4 && size=='R' || size=='r'))
{
    price=274;
    total=total+price;
}
else if((input== 5 && size=='S' || size=='s'))
{
    price=250;
    total=total+price;
}
else if((input==5 && size=='R' || size=='r'))
{
    price=291;
    total=total+price;
}
else if((input==6 && size=='S' || size=='s'))
{
    price=250;
    total=total+price;
}
else if((input==6 && size=='R' || size=='r'))
{
    price=291;
    total=total+price;
}
else if((input==7 && size=='S' || size=='s'))
{
    price=250;
    total=total+price;
}
else if((input==7 && size=='R' || size=='r'))
{
```

```

        price=291;
        total=total+price;
    }
    else if((input==8 && size=='S' || size=='s'))
    {
        price=250;
        total=total+price;
    }
    else if((input==8 && size=='R' || size=='r'))
    {
        price=291;
        total=total+price;
    }
    else if((input== 9&& size=='S' || size=='s'))
    {
        price=335;
        total=total+price;
    }
    else if((input==9 && size=='R' || size=='r'))
    {
        price=348;
        total=total+price;
    }
    else if((input== 10 && size=='S' || size=='s'))
    {
        price=335;
        total=total+price;
    }
    else if((input==10 && size=='R' || size=='r'))
    {
        price=341;
        total=total+price;
    }
    else if((input== 11 && size=='S' || size=='s'))
    {
        price=239;
        total=total+price;
    }
    else if((input== 11 && size=='R' || size=='r'))
    {
        price=391;
        total=total+price;
    }
    return total;
}

int menu3()
{ char size;
int input=0,total=0,price=0;
printf(".....Chochlate chiller ..... \n");
printf("1. ORIGINAL ICED CHOCOLATE: \n price: small=348 regular= 365 \n");

```

```

        printf("2. WHITE ICED CHOCOLATE : \n price: small=348 regular= 365 \n");
        printf("3. CHOCOLATE DELIGHT:\n price: small=348 regular= 400 \n");
        printf("Enter R for regular and S for small \n");
        scanf("\n%c",&size);
        printf("Choose the Number \n ");
        scanf("\n%d",&input);
        if(input==1 && size=='R' || size=='r')
        {
            price=365;
            total=total+price;
        }
        else if((input==1 && size=='S' || size=='s'))
        {
            price=348;
            total=total+price;
        }
        else if((input==2 && size=='R' || size=='r'))
        {
            price=365;
            total=total+price;
        }
        else if((input==2 && size=='S' || size=='s'))
        {
            price=348;
            total=total+price;
        }
        else if((input==3 && size=='R' || size=='r'))
        {
            price=400;
            total=total+price;
        }
        else if((input==3 && size=='S' || size=='s'))
        {
            price=348;
            total=total+price;
        }
        return total;
    }
}
int menu4()
{
    char size;
    int input=0,total=0,price=0;
    printf("..... FUSION ..... \n");
    printf("1.ICED LIME : \n price: small=335 regular= 365 \n");
    printf("2.APPLE CHILLER: \n price: small=335 regular= 365 \n");
    printf("3.CHAH CHILLER:\n price: small=348 regular= 400 \n");
    printf("4.GREEN TEA CHILLER:\n price: small=348 regular= 400 \n");
    printf("Enter R for regular and S for small \n");
    scanf( "\n%c",&size);
    printf("Choose the Number \n ");

```

[illegible]

```

for ( int i= 1;;i++)
{
    printf(" 1. Espresso & MOCHA CHILLER:\n");
    printf(" 2. Over ice: \n");
    printf(" 3. Chocolate Chiller:\n");
    printf(" 4. Fusion  \n");
    printf("Enter N to exit \n");
    printf("Select the menu you want  \n",i );
    scanf("\n%s",Menu);
    if ( strcmp(Menu, "1" )==0)
        a=menu1();

    else if ( strcmp(Menu, "2" )==0)
    {
        b=menu2();
    }
    else if ( strcmp(Menu, "3" )==0)
    {
        c= menu3();
    }
    else if ( strcmp(Menu, "4" )==0)
    {
        d=menu4();
    }
    else if ( strcmp(Menu, "No" )==0 || strcmp(Menu,"N")==0 || strcmp(Menu,"n")==0)
    {
        break;
    }
    total=a+b+c+d;
}

printf("Your bill without S.R and tax is %d \n ",total);
SR=500;
printf("Service charge = %d \n",SR);
tax=(20*total)/100;
printf("Your TAX is = %.2f\n",tax);
Stotal=SR+tax+total;
printf("Your Total Bill is %.2f",Stotal);
return 0;
}

```

Output:

[illegible]

1. Espresso & MOCHA CHILLER:
2. Over ice:
3. Chocolate Chiller:
4. Fusion

Enter N to exit

Select the menu you want

4

..... FUSION

1. ICED LIME :

```
price: small=335 regular= 365
```

2. APPLE CHILLER:

```
price: small=335 regular= 365
```

3. CHAI CHILLER:

```
price: small=348  regular= 400
```

4.GREEN TEA CHILLER:

```
price: small=348  regular= 400
```

Enter R for regular and S for small

R

Choose the Number

4

1. Espresso & MOCHA CHILLER:

2. Over ice:

3. Chocolate Chiller:

4. Fusion

Enter N to exit

Select the menu you want

4

..... FUSION

1. ICED LIME :

```
price: small=335 regular= 365
```

2. APPLE CHILLER:

```
price: small=335 regular= 365
```

3. CHAI CHILLER:

```
price: small=348  regular= 400
```

4.GREEN TEA CHILLER:

```
price: small=348  regular= 400
```

Enter R for regular and S for small

5

Choose the Number

2

1. Espresso & MOCHA CHILLER:

2. Over ice:

3. Chocolate Chiller:

4. Fusion

Enter N to exit

Select the menu you want

n

Your bill without S.R and tax is 335

Service charge = 500

Your TAX is = 67.00

Your Total Bill is 902.00