# Presidency University, Bengaluru

Data Structures Lab

# Lab Sheet 2

## Objectives

* **User Defined Functions Problem1: Different type of functions.**

|  |  |
| --- | --- |
| **Function with parameter and return value** | **Function with parameters and no return value** |
| int sum(int a, int b)  {  int total; total = a+b; return(total);  }  void main()  {  int result,m,n;  printf("Enter the value of m and n\n"); scanf("%d%d",&m,&n); result=sum(m,n);  printf(" The result is %d\n",result);  } | void sum(int a, int b)  {  int total; total =a+b;  printf(" The result is %d\n",total);  }  void main()  {  int m,n;  printf("Enter the value of m and n\n"); scanf("%d%d",&m,&n);  sum(m,n);  } |
| **Function without return value and without**  **parameter** | **Function without parameter and with return**  **Value** |
| void sum()  {  int total,a,b;  printf("Enter the value of a and b\n"); scanf("%d%d",&a,&b);  total = a+b;  printf(" The result is %d\n",total);  }  void main()  {  sum();  } | int sum()  {  int total,a,b;  printf("Enter the value of a and b\n"); scanf("%d%d",&a,&b);  total = a+b; return(total);  }  void main()  {  int result; result=sum();  printf(" The result is %d\n",result);  } |

### **Problem 2:** Write a program to compute the factorial of a number with following requirement.

#### Requirement:

1: Write a function to read the number to which factorial to be computed.

#### int read();

2: Write a function to display the number read in the function read().

#### void display(int n);

3: Write a function to compute the factorial of the number

#### int fact(int n);

Use the following main function to call the above functions.

void main()

{

int number, factorial;

printf(“Enter the number to compute the factorial\n”); number=read();

printf(“The Number entered \n”); display(number); factorial=fact(number);

printf(“The Factorial of the number=\n”); display(factorial);

}

## Problem 3:

**Passing Array to the function**

#include<stdio.h>

void read(int a[],int size)

{

int i;

printf("Ente %d items into the array\n",size);

for(i=0;i<size;i++) scanf("%d",&a[i]);

}

void display(int a[],int size)

{

int i;

printf("The content of array is\n"); for(i=0;i<size;i++)

printf("%d element is %d\n",i,a[i]);

}

void main()

{

int a[50],number;

printf("enter how many number to read\n"); scanf("%d",&number);

read(a,number); display(a,number);

}

#### Exercise 1:

Hari’s want to buy 10 items from the shop. He want to store the price of all the items. Help Hari to store the price list of all ten items.

Requirements

1: Declare an array of size 10.

2: Write a function to read price of 10 items from the user

#### void Read(int plhari[], int size)

3: Write a function to Display the price of all ten items.

#### void Display (int plhari[], int size)

4: Write a main function to declare the array of 10 element. The functions Read and Display should be called from main function.

#include<stdio.h>

void read(int plhari[],int size)

{

int i;

printf("Ente %d items into the array\n",size); for(i=0;i<size;i++)

scanf("%d",&plhari[i]);

}

void display(int plhari[],int size)

{

int i;

printf("The content of array is\n"); for(i=0;i<size;i++)

printf("%d element is %d\n",i,plhari[i]);

}

void main()

{

int plhari[50],number;

printf("enter how many number to read\n"); scanf("%d",&number);

read(plhari,number); display(plhari,number);

}

**Exercise 2:** Hari want to buy the same 10 items after 1 year. Hari understand that the cost of each item has doubled than previous year. Help Hari to compute the new cost i.e, multiply cost of each item by 2 and display the new cost.

1: Write a function update1 to multiply each element by 2.

#### void update(int plhari[],int size)

Example: If the item list is

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 23 | 43 | 21 | 35 | 52 | 12 | 16 | 10 | 66 | 55 |

Output should be:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 46 | 86 | 42 | 70 | 104 | 24 | 32 | 20 | 132 | 110 |

#### Exercise 4:

Hari want to know the total cost required to purchase all the items. Help Hari to calculate sum of all price and display the price.

Write a function to add all the price and return the value.

#### int addall(int plhari[],size)

**{**

#### int i,total;

**/\* Complete the program\*/ return(total);**

#### }

**Modify the main function to call the function addall and display the value of total**

Example: If the item list is

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 46 | 86 | 42 | 70 | 104 | 24 | 32 | 20 | 132 | 110 |

The output should be:

**46+86+42+70+104+24+32+20+132+110=666**

## Take Home Exercise

### Hari understand that the value of the item purchased in a specified position is changed by certain value.

Write a function which will update the value in the respective position and return the updated value to the main function.

The function Signature

## int udpatepos(int a[], int position, int value)

**{**

## }

### Modify the main program to call the update position function as follows.

void main()

{

int uvalue,plhari[50],number,sum,pos,value; printf("enter how many number to read\n"); scanf("%d",&number);

read(plhari,number);

printf("The content of array is\n");

display(plhari,number); update(plhari,number); printf("The updated array is\n"); display(plhari,number); sum=addall(plhari,number);

printf("The sum of all the elements is%d",sum); printf("Enter the position and the value to be updated\n"); scanf("%d%d",&pos,&value);

uvalue= updatepos(plhari,pos,value);

printf("The updated value in %d position is %d\n",pos,uvalue); display(plhari,number);

}