MME 238 – ASSIGNMENT

SUBMITTED TO

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Problem Statement

Write a C program to find the smallest of 4 integers taken as input using-

i) if-else statement
ii) Nested if-else statement
iii) Conditional Operator

Solution

i) if-else statement

```c
/*
C Program to find the smallest of four integers.
Method used:     nested if-else
Student ID:      1711037
*/

#include<stdio.h>

int main()
{
    int a,b,c,d,min;

    printf("Enter four numbers:\n");
    scanf("%d %d %d %d",&a,&b,&c,&d);

   if(a<b && a<c && a<d){
       //Checking if a is smallest
       min=a;
   } else if(b<c && b<d){
      //Checking is b is smallest
      min=b;
   } else if(c<d){
       //Checking if c is smallest
       min=c;
   } else {
       //If none of the above is true then d is smallest
       min=d;
   }

    printf("The smallest number is %d\n",min);

    return 0;
}
```

ii) Nested if-else statement

```c
/*
C Program to find the smallest of four integers.
Method used:     nested if-else
Student ID:      1711037
*/

#include<stdio.h>

int main()
{
    int a,b,c,d,min;

    printf("Enter four numbers:\n");
    scanf("%d %d %d %d",&a,&b,&c,&d);

   if(a<b){
    if(a<c && a<d){ //Valid when a is smallest
        min=a;
    } else if(c<d){ //Valid when a<b but c is smallest
        min=c;
    } else {        //Valid when a<b but d is smallest
        min=d;
    }
   } else if(b<c){  //Valid when b<a
       if(b<d){
        min=b;
    } else {        //Valid when b<c but d is smallest
        min=d;
    }
   } else if(c<d){  //Valid when c is smallest
       min=c;
   } else {         /*If none of the above condition is valid then
                      d is smallest*/
       min=d;
   }
    printf("The smallest number is %d\n",min);


    return 0;
}
```

iii) Conditional Operator

```c
C Program to find the smallest of four integers.
Method used:     conditonal operator
Student ID:      1711037
*/

#include<stdio.h>

int main()
{
    int a,b,c,d,e,f,min;

    printf("Enter four numbers:\n");
    scanf("%d %d %d %d",&a,&b,&c,&d);

    e=(a<b)?a:b; //e is smaller between and a and b
    f=(c<d)?c:d; //f is smalleer between c and d
    min=(e<f)?e:f; /*min is smaller between e and f thus the smallest
                     among four numbers*/

    /*
    Alternate way (reduces readability)
    min=(e=(a<b)?a:b)<(f=(c<d)?c:d)?e:f;
    */

    printf("The smallest number is %d\n",min);

    return 0;
}
```

Problem Statement

Write a C program to find the second maximum of 3 integers taken as input using-

i) if-else statement
ii) Nested if-else statement
iii) Conditional Operator

Solution

i) if else statement

```c
/*
C Program to find the second largest of three integers.
Method used:     if-else
Student ID:      1711037
*/

#include<stdio.h>

int main()
{
    int a,b,c,second_largest;

    printf("Enter three numbers: ");
    scanf("%d %d %d",&a,&b,&c);

    if((a>=b && a<=c) || (a>=c && a<=b)){
    //Directly checking if a is second maximum
        second_largest=a;

    } else if((b>=c && b<=a) || (b>=a && b<=c)){
    //Directly checking if b is second maximum
        second_largest=b;

    } else if((c>=a && c<=b) || (c>=b && c<=a)){
    //Directly checking if c is second maximum
        second_largest=c;
    }

    printf("Second maximum number is %d\n",second_largest);

    return 0;
}
```

ii) Nested if-else statement

```c
/*
C Program to find the second largest of three integers.
Method used:     if-else
Student ID:      1711037
*/

#include<stdio.h>

int main()
{

    int a,b,c,second_largest;

    printf("Enter three numbers: ");
    scanf("%d %d %d",&a,&b,&c);

    if(a>b && a>c){          //Checking if a is largest
        if(b>c)
            second_largest=b;
         else
            second_largest=c;

    } else if(b>a && b>c) { //Checking if b is largest
        if(a>c)
            second_largest=a;
         else
            second_largest=c;
        }

    } else {                 //Valid when c is largest
        if(a>b)
            second_largest=a;
         else
            second_largest=b;
    }

    printf("Second largest is %d\n",second_largest);

}
```

iii) Conditional Operator

```c
/*
C Program to find the second largest of three integers.
Method used:     conditional operator
Student ID:      1711037
*/

#include<stdio.h>

int main()
{
    int a,b,c,max,mid,min,x;;

    printf("Enter three numbers: ");
    scanf("%d %d %d",&a,&b,&c);

    min=(x=(a<b)?a:b)<c?x:c; //Minimum of three numbers
    max=(x=(a>b)?a:b)>c?x:c; //Maximum of three numbers
    mid=a+b+c-min-max;
    //Mid of three numbers which is the second maximum

    /*Alternate way (reduces readability)
    mid=(a>=b && a>=c) ? ((b>=c) ? b:c) : ((b>=c) ? ((a>=c) ? a:c) :
                                           ((a>=b) ? a:b));
    */

    printf("Second maximum number is %d\n",mid);

    return 0;
}
```