

IT 161_Lab10

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Date: 15/03/2022

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Experiment 1: Once Bob and Alice were playing with toys numbered randomly (+ve integers). Your program should arrange the toys as follows:

- A. Bob should arrange the toys in ascending order.
- B. Alice should arrange the toys in descending order.

Software: Online compiler and debugger for C.

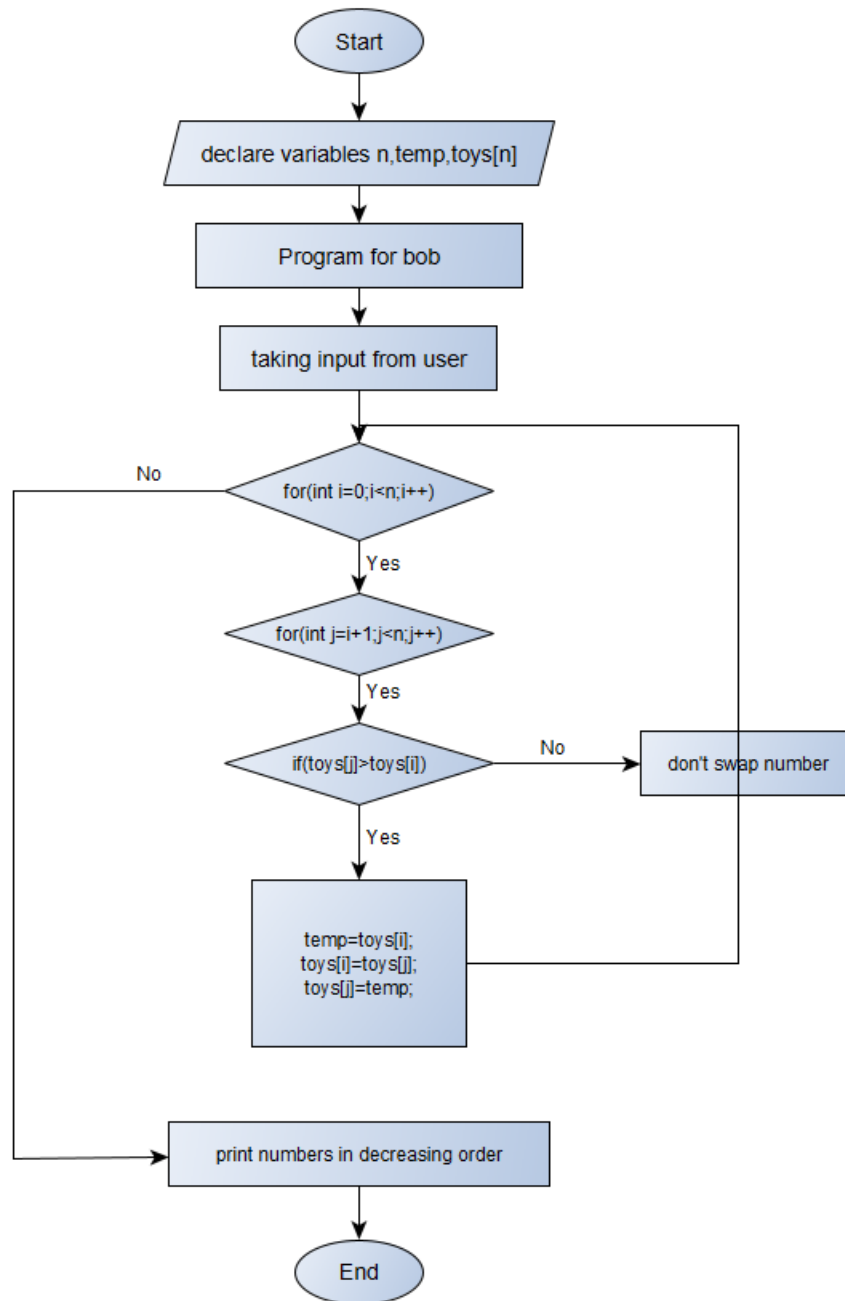
Algorithm:

Firstly, define the variables and array which stores the value of our input. Then apply “for” loop to read and print the input from the user into the array.

Then we will apply two for loops from 1st position and 2nd position to compare the values. We will use if statement to check which value is greater. And used swapping number concept to switch the number to their place either ascending or descending order.

Thus, we printed number in descending and ascending order.

FLOWCHART:



CODE:

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

```
int main(){
    int n,temp;
    int toys[n];
    printf("Program for bob:-\n");
    printf("Enter the value of bob:");
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        printf("Enter value:");
        scanf("%d",&toys[i]);
    }
    for(int i=0;i<n;i++){
        printf("%d\t",toys[i]);
    }
    for(int i=0;i<n;i++){
        for(int j=i+1;j<n;j++){
            if(toys[j]>toys[i]){
                temp=toys[i];
                toys[i]=toys[j];
                toys[j]=temp;
            }
        }
    }
    printf("\n");
    printf("Output:");
    for(int i=0;i<n;i++){
        printf("%d\t",toys[i]);
    }
    printf("\n");
    printf("Program for Alice:\n");
    for(int i=0;i<n;i++){
        for(int j=i+1;j<n;j++){
            if(toys[j]<toys[i]){
                temp=toys[i];
                toys[i]=toys[j];
                toys[j]=temp;
            }
        }
    }
    printf("\n");
```

```

printf("Output:");
for(int i=0;i<n;i++){
    printf("%d\t",toys[i]);
}
return 0;
}

```

The screenshot shows a C code editor with a toolbar at the top containing icons for Run, Debug, Stop, Share, Save, Beautify, and a download icon. The language is set to C. The code is in a file named 'main.c' and implements a bubble sort algorithm for two arrays of toys.

```

1  #include <stdio.h>
2
3  int main(){
4      int n,temp;
5      int toys[n];
6      printf("Program for bob:-\n");
7      printf("Enter the value of bob:");
8      scanf("%d",&n);
9      for(int i=0;i<n;i++){
10         printf("Enter value:");
11         scanf("%d",&toys[i]);
12     }
13     for(int i=0;i<n;i++){
14         printf("%d\t",toys[i]);
15     }
16     for(int i=0;i<n;i++){
17         for(int j=i+1;j<n;j++){
18             if(toys[j]>toys[i]){
19                 temp=toys[i];
20                 toys[i]=toys[j];
21                 toys[j]=temp;
22             }
23         }
24     }
25     printf("\n");
26     printf("Output:");
27     for(int i=0;i<n;i++){
28         printf("%d\t",toys[i]);
29     }
30     printf("\n");
31     printf("Program for Alice:\n");
32     for(int i=0;i<n;i++){
33         for(int j=i+1;j<n;j++){
34             if(toys[j]<toys[i]){
35                 temp=toys[i];
36                 toys[i]=toys[j];
37                 toys[j]=temp;
38             }
39         }
40     }
41     printf("\n");
42     printf("Output:");
43     for(int i=0;i<n;i++){
44         printf("%d\t",toys[i]);
45     }
46     return 0;
47 }

```

RESULT:

Program for bob ->

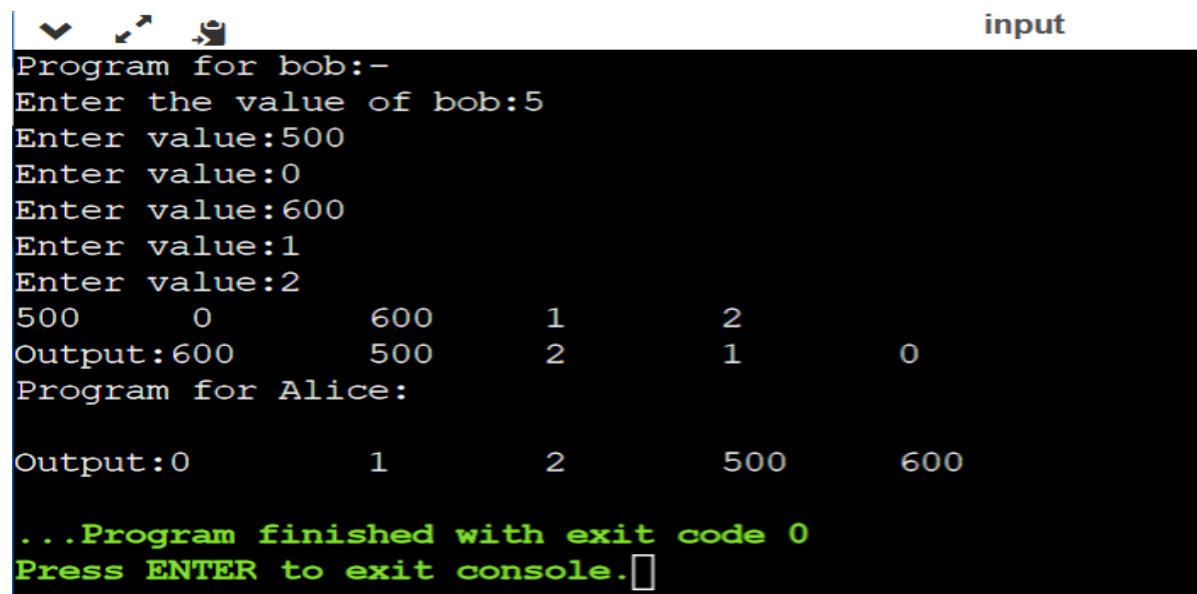
Enter the value for bob : 5

Enter the numbers : 500,0,600,1,2

Output: 600,500,2,1,0

Program for Alice:

Output:0 1 2 500 600



The screenshot shows a terminal window with a dark background. At the top right, the word "input" is written in a light blue font. The terminal content is as follows:

```
Program for bob:-
Enter the value of bob:5
Enter value:500
Enter value:0
Enter value:600
Enter value:1
Enter value:2
500      0      600      1      2
Output:600      500      2      1      0
Program for Alice:

Output:0      1      2      500      600

...Program finished with exit code 0
Press ENTER to exit console.
```

Experiment 2:

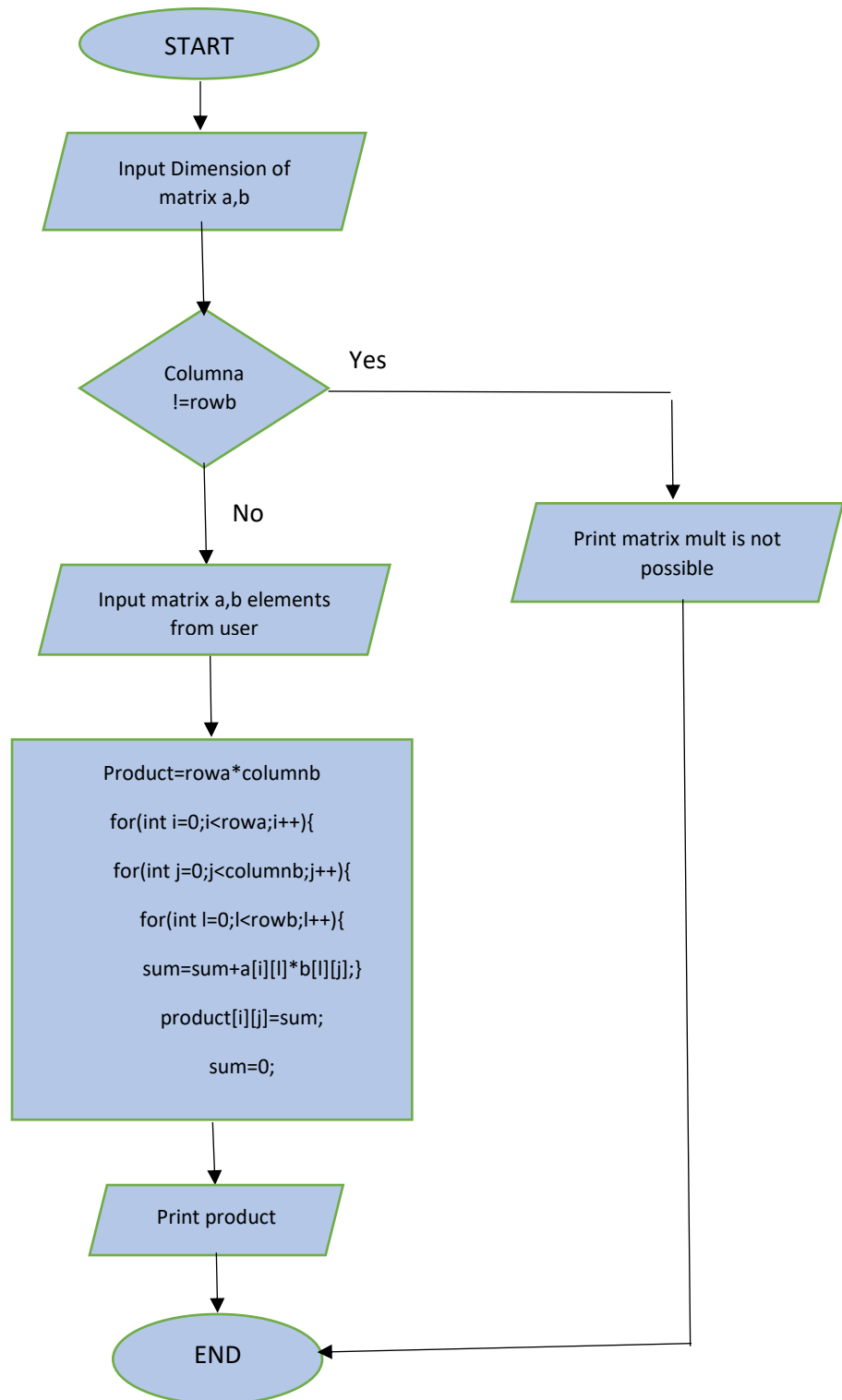
Write a c program to find the multiplication of 2_matrices.

Software: Online compiler and debugger for C.

Algorithm:

1. Take input of the dimensions of matrix a and b from user.
2. Check whether $\text{columna} == \text{rowb}$. If $\text{columna} == \text{rowb}$, then follow steps 3 and 4. Else print matrix multiplication is not possible.
3. Take input of elements of matrix a and b from user.
4. Multiply rows of a with column of b and after each multiplication add it with sum.
5. After 1 row and column completion put the result into product.
6. Finally calculate the product and print it in $\text{rowa} * \text{column}$ format.

FLOWCHART:



CODE:

```
#include <stdio.h>

int main(){
    int rowa,columna;
    printf("Enter Dimension of matrix a:");
    scanf("%d %d",&rowa,&columna);
    int rowb,columnb;
    printf("Enter Dimension of matrix b:");
    scanf("%d %d",&rowb,&columnb);

    if (columna!=rowb){
        printf("Matrix multiplication is not possible");
    }else{
        int a[rowa][columna];
        printf("Enter the elements of matrix a:\n");
        for(int i=0;i<rowa;i++){
            for(int j=0;j<columna;j++){
                scanf("%d", &a[i][j]);
            }
        }
        int b[rowb][columnb];
        printf("Enter the elements of matrix b:");
        for(int i=0;i<rowb;i++){
            for( int j=0;j<columnb;j++){
                scanf("%d", &b[i][j]);
            }
        }
        int product[rowa][columnb];
        int sum=0;
        for(int i=0;i<rowa;i++){
            for(int j=0;j<columnb;j++){
                for(int l=0;l<rowb;l++){
                    sum=sum+a[i][l]*b[l][j];
                }
                product[i][j]=sum;
                sum=0;
            }
        }
        printf("Matrix resultant\n");
        for(int i=0;i<rowa;i++){
            for(int j=0;j<columnb;j++){
                printf("%d ", product[i][j]);
            }
            printf("\n");
        }
    }
    return 0;
}
```



```
main.c
1  /*Name:DIPEAN DASGUPTA ROLL:202151188 EXPERIMENT 2:MULT OF MATRIX WITH ARRAY IN C*/
2
3  #include <stdio.h>
4
5  int main()
6  {
7      int rowa,columna;
8      printf("Enter Dimension of matrix a:\n");
9      scanf("%d %d",&rowa,&columna);
10     int rowb,columnb;
11     printf("Enter Dimension of matrix b:\n");
12     scanf("%d %d",&rowb,&columnb);
13
14     if (columna!=rowb){
15         printf("Matrix multiplication is not possible");
16     }else{
17         int a[rowa][columna];
18         printf("Enter the elements of matrix a:\n");
19         for(int i=0;i<rowa;i++){
20             for(int j=0;j<columna;j++){
21                 scanf("%d",&a[i][j]);
22             }
23         }
24         int b[rowb][columnb];
25         printf("Enter the elements of matrix b:\n");
26         for(int i=0;i<rowb;i++){
27             for(int j=0;j<columnb;j++){
28                 scanf("%d",&b[i][j]);
29             }
30         }
31         int product[rowa][columnb];
32         int sum=0;
33         for(int i=0;i<rowa;i++){
34             for(int j=0;j<columnb;j++){
35                 for(int l=0;l<rowb;l++){
36                     sum=sum+a[i][l]*b[l][j];
37                 }
38                 product[i][j]=sum;
39                 sum=0;
40             }
41         }
42         printf("Matrix resultant\n");
43         for(int i=0;i<rowa;i++){
44             for(int j=0;j<columnb;j++){
45                 printf("%d ", product[i][j]);
46             }
47             printf("\n");
48         }
49     }
50     return 0;
51 }
```

OUTPUT:

```
input
Enter Dimension of matrix a:2 3
Enter Dimension of matrix b:3 3
Enter the elements of matrix a:
4 5 6
7 8 9
Enter the elements of matrix b:
2 4 6
3 5 7
4 6 8
Matrix resultant
47 77 107
74 122 170

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Enter Dimension of matrix a:2 2
Enter Dimension of matrix b:2 2
Enter the elements of matrix a:
12 8
7 9
Enter the elements of matrix b:
6 3
5 1
Matrix resultant
112 44
87 30

...Program finished with exit code 0
Press ENTER to exit console.
```

