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Program 1. Introduction to Algorithm and Flowchart

Algorithm :- An algorithm is a procedure used for solving a problem or performing a computation. Algorithms act as an exact list of instructions that conduct specified actions step by step in either hardware- or software-based routines.

Flowchart :- A flowchart is a type of diagram that represents a workflow or process. A flowchart can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task. The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows

Difference between Algorithm and Flowchart

S.no	Algorithm	Flowchart
1.	Algorithms are step by step procedures to solve the problem	Flowchart is a diagram created by different shapes to show the flow of data.
2.	Algorithms are complex to understand.	Flowchart is easy to understand.
3.	In the algorithm plain text is used.	In flowchart, symbols/shapes are used.
4.	Algorithm does not follow any rules.	Flowchart follows rules to be constructed.

Program 2: To check whether an year is Leap year or not

Code:

```
#include<stdio.h>
int main(){
    int year;
    printf("Enter the Year: ");
    scanf("%d", &year);
    if (year % 400 == 0) {
        printf("%d is a leap year.\n", year);
    }

    else if (year % 100 == 0) {
        printf("%d is not a leap year.\n", year);
    }

    else if (year % 4 == 0) {
        printf("%d is a leap year.\n", year);
    }

    else {
        printf("%d is not a leap year.\n", year);
    }

    return 0;
}
```

Output



```
shivam@shivam: ~/Desktop/JS
shivam@shivam:~$ cd "/home/shivam/Desktop/JS/" && gcc random.c -o random &
& "/home/shivam/Desktop/JS/"random
Enter the Year: 2016
2016 is a leap year.
shivam@shivam:~/Desktop/JS$
```

The image shows a terminal window with a dark background. The title bar at the top reads "shivam@shivam: ~/Desktop/JS" and includes standard window control buttons (yellow, green, red). The terminal content shows a user running a C program. The command to compile and run is `cd "/home/shivam/Desktop/JS/" && gcc random.c -o random & & "/home/shivam/Desktop/JS/"random`. The program prompts for a year, and the user enters "2016". The program outputs "2016 is a leap year." The prompt then changes to `shivam@shivam:~/Desktop/JS$`.

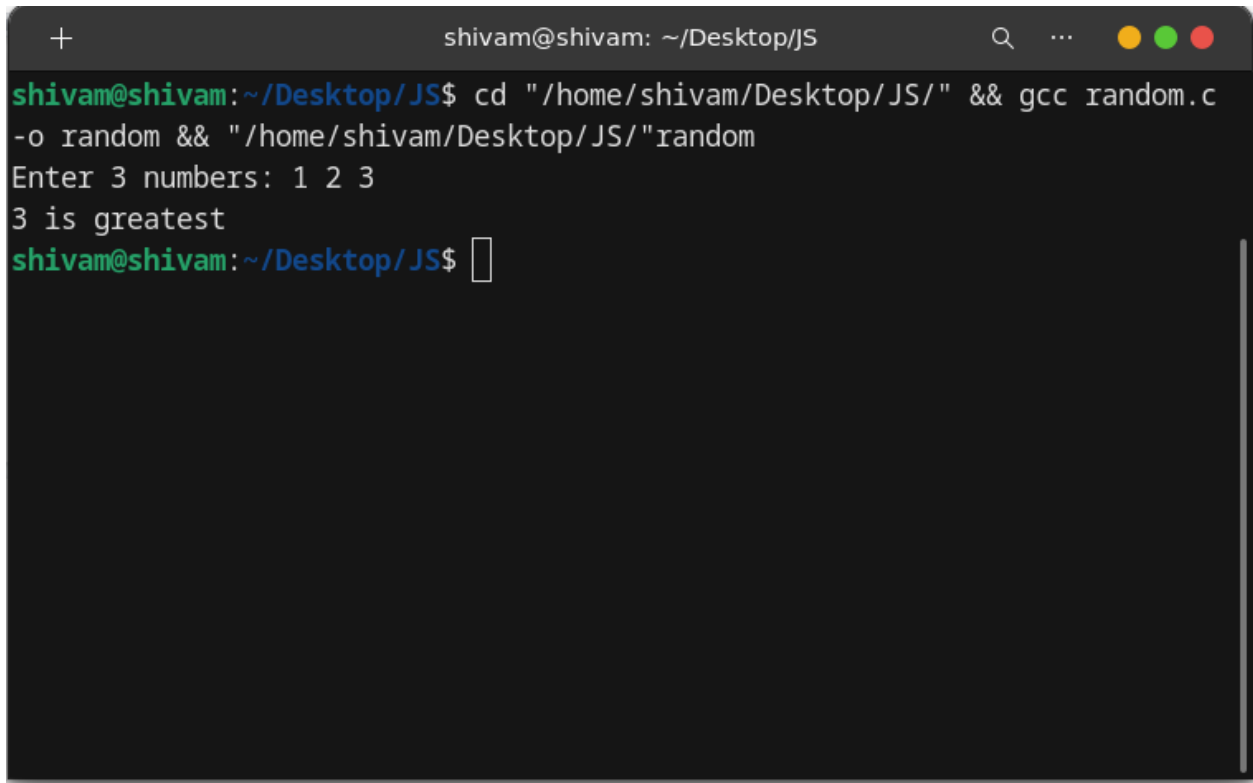
Program 3: To make a program using nested if

Code:

```
#include<stdio.h>
int main(){
    int a,b,c;
    printf("Enter 3 numbers: ");
    scanf("%d%d%d",&a,&b,&c);
    if(a>b){
        if(a>c){
            printf("%d is greatest\n",a);
        }
    }
    if(b>a){
        if(b>c){
            printf("%d is greatest\n",b);
        }
    }
    if(c>a){
        if(c>b){
            printf("%d is greatest\n",c);
        }
    }

    return 0;
}
```

Output:



```
shivam@shivam: ~/Desktop/JS
shivam@shivam:~/Desktop/JS$ cd "/home/shivam/Desktop/JS/" && gcc random.c
-o random && "/home/shivam/Desktop/JS/"random
Enter 3 numbers: 1 2 3
3 is greatest
shivam@shivam:~/Desktop/JS$
```

A terminal window with a dark background. The title bar shows a plus icon, the text 'shivam@shivam: ~/Desktop/JS', a search icon, and three colored window control buttons (yellow, green, red). The terminal content shows a user running a C program. The prompt is 'shivam@shivam:~/Desktop/JS\$'. The user enters 'cd "/home/shivam/Desktop/JS/" && gcc random.c -o random && "/home/shivam/Desktop/JS/"random'. The program outputs 'Enter 3 numbers: 1 2 3' and '3 is greatest'. The prompt returns to 'shivam@shivam:~/Desktop/JS\$' with a cursor.

Program 4: To print 2 patterns

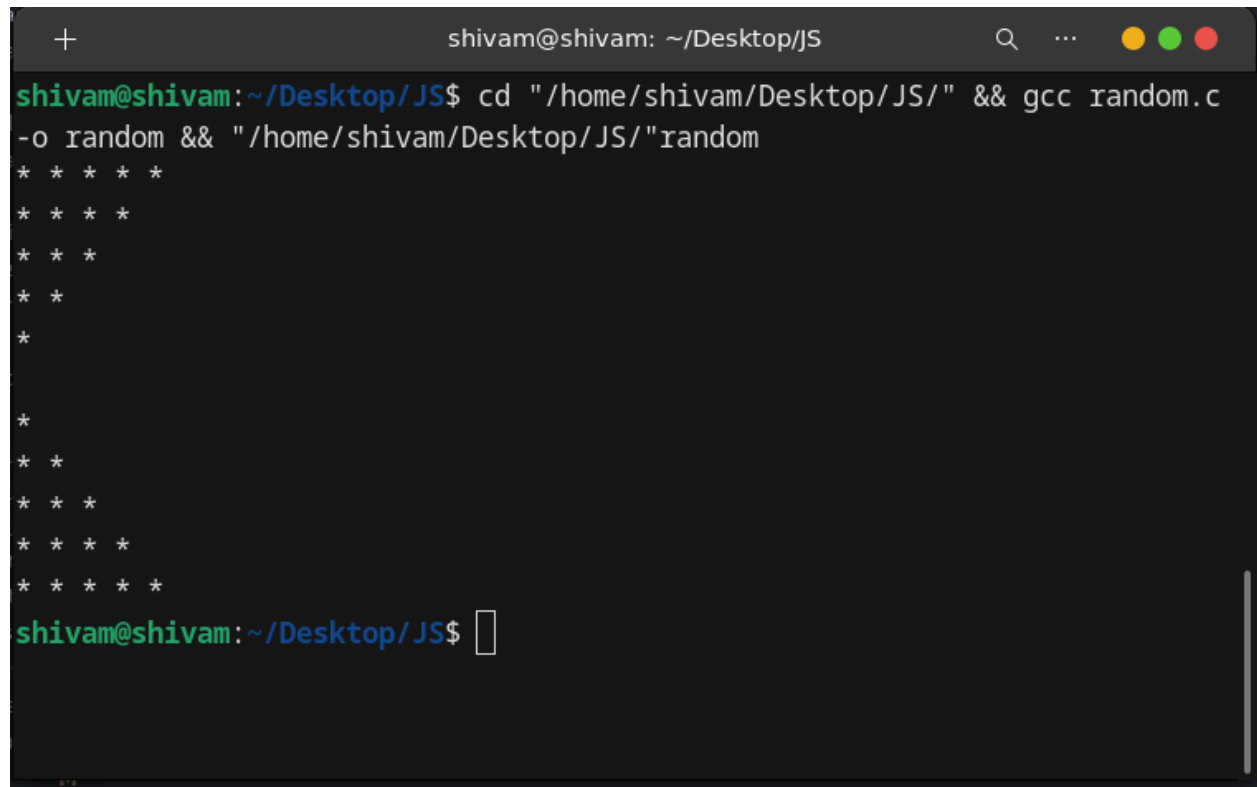
```
1 * * * * *  
  * * * *  
   * * *  
    * *  
     *
```

```
2 *  
  * *  
   * * *  
    * * * *  
     * * * * *
```

Code:

```
#include<stdio.h>  
int main(){  
    int i,j;  
    for(i=0;i<5;i++){  
        for(j=5;j>i;j--){  
            printf("* ");  
        }  
        printf("\n");  
    }  
    printf("\n");  
    for(i=0;i<5;i++){  
        for(j=0;j<=i;j++){  
            printf("* ");  
        }  
        printf("\n");  
    }  
  
    return 0;  
}
```

Output:



```
shivam@shivam: ~/Desktop/JS
shivam@shivam:~/Desktop/JS$ cd "/home/shivam/Desktop/JS/" && gcc random.c
-o random && "/home/shivam/Desktop/JS/"random
* * * * *
* * * *
* * *
* *
*
*
*
* *
* * *
* * * *
* * * * *
shivam@shivam:~/Desktop/JS$
```