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Lesson Plan

Loops

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Topics to be covered:

- Introduction to Iterative statements/Loops
- The for loop
- The while loop
- The do-while loop

Introduction to Iterative statements/Loops

The simple dictionary meaning of loop is a structure, series, or process, the end of which is connected to the beginning. We have the following types of iterative statements -

- The while loop
- The for loop
- The do-while loop

The For Loop

The advantage of a for loop is we know exactly how many times the loop will execute even before the actual loop starts executing.

Syntax:

```
for (init-statement; condition; final-expression)
{
    statement
    // logic
}
```

Init-statement: This statement is used to initialize or assign a starting value to a variable which may be altered over the course of the loop (we will see this while solving examples). It is used/referred only once at the start of the loop.

Condition: This condition serves as a loop control statement. The loop block is executed until the condition evaluates to true.

Final-expression: It is evaluated after each iteration of the loop. It is generally to update the values of the loop variables.

Example:

```
for(int i = 1; i < 6; i++ ){
cout << i << " ";
}
```

Output: 1 2 3 4 5

The while loop

A while loop is a loop that runs through its body, known as a while statement, as long as a predetermined condition is evaluated as true.

Syntax:

```
while (condition)
statement;

Example:
int i = 1;
while (i ⩽ 5)
{
cout << i << " ";
i = i + 1;
}
```

Output: 1 2 3 4 5

The do-while loop

Do-while loop tests the condition at the end of each execution for the next iteration. In other words, the loop is executed at least once before the condition is checked. Rest everything is the same as while loop.

Syntax:

```
do
{
statement;
} while (condition);

Example:
int idx = 1;
do
{
cout << idx << " ";
idx++;
} while (idx ⩽ 5);
```

Output: 1 2 3 4 5

Q1. Print hello world 'n' times. Take 'n' as input from user

Solution:

```
#include<iostream>
Using namespace std;
```

```
int main()
{
 int n;
cin>>n;
 for(int i=1;i<=n;i++){
 cout<<"hello world"<<endl;
}
}
```

Q2. Print numbers from 1 to 100.

Solution:

```
#include<iostream>
Using namespace std;

int main()
{
for(int i=1;i<=100;i++){
 cout<<i<<endl;
}
}
```

Q3. Print all even numbers from 1 to 100.

Solution:

```
#include<iostream>
Using namespace std;

int main()
{
for(int i=2;i<=100;i+=2){
 cout<<i<<endl;
}
}
```

Q4. Print the table of 19.

Solution:

```
#include<iostream>
Using namespace std;

int main()
{
for(int i=1;i<=10;i++){
 cout<<19*i<<endl;
}
}
```

Q5. Display this AP - 1,3,5,7,9.. upto 'n' terms.

```
#include<iostream>
Using namespace std;

int main()
{
 int n;
 cin>>n;
for(int i=1;i⩽n;i+=2){
 cout<<i<<endl;
}
}
```

Q6. Display this GP - 1,2,4,8,16,32,.. upto 'n' terms.

Solution:

```
#include<iostream>
Using namespace std;

int main()
{
 int n;
 cin>>n;
for(int i=1;i⩽n;i*=2){
 cout<<i<<endl;
}
}
```

Q7. Display this AP - 100,97,94,..upto all terms which are positive.

```
#include<iostream>
Using namespace std;

int main()
{
for(int i=100;i>0;i-=3){
 cout<<i<<endl;
}
}
```

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THANK YOU !

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