Lecture 2

Introduction to programming

Review about compilation and interpretation

In languages Java,C,C++ first you have to compile your source file, and after the compilation phase it generates some intermediate file(like .class) in Java. And then in order to execute(to see the output) of your program you have to run the intermediate(.class) file.

In languages like JavaScript and Python no intermediate files are generated, these compilers automatically converts your program into machine level language and gives you the output.

Let see a demo on how Java

At first you compile your source file and if the source file has no errors, then Java compiler will create an intermediate file(with .class extension), and then you run these .class file in order to get your output.

For the students who heard “Java is portable” or “Java is platform independent” see me in brake

Review of math operators

We have seen different operators like +,-,*,%,/

One important thing knowing the difference between % and /.

% - Gives the remainder

/ - Gives Quotient

Difference between % and /

% - Gives remainder.

```
2 )  5  ( 2
     4
  ---------
     1
```

In above case, console.log(5%2); Output is 1.

What values a variable takes

Let’s talk about what a variable is, when we say var amount = 10;

The value 10 is stored on RAM, and whenever, you write variable name amount in your code, it retrieves the value.

```
var amount = 10;
amount = amount + 20;
console.log(amount);
```

Output is the above program is 30.

Value stored in the RAM are also updated, as you update them in your code.

What a variable can store

var abc = 10;

var x = 1.2

var y = true;

var c = false;

var x = “sample text”;

true and false are represented as 1 and 0, inside the computer.

Comparisons

We know basic math relation operators:

>

<

>=

<=

==

Comparisons

Every programming language has to support these relational operators, And these comparisons results true or false.

Let’s take a basic exam question, what get printed to the screen after executing

```
console.log(12>3);
console.log(3==4);
```

Output:

```
true
false
```

if - without else

```
var amount =17;
if(amount >15){
    console.log("eat pizza");
    amount = amount -15;
}
if(amount >5){
    console.log("eat candy");
}
```

If - else

```
var a = 12;
var b = 22;
if(a > b){
  console.log("a is largest");
}else{
  console.log("b is largest");
}
```

```
var amount = 3
if(amount > 12){
  console.log("go to movie")
}else{
  console.log("no movie, please study")
}
amount = amount + 2;
if(amount >= 5){
  console.log("eat pizza")
}
```

if else if else if …… else

```
var time =19 ;
if (time<10) {
    console.log("good morning");
}else if (time < 15){
  Console.log("good afternoon");
} else if (time <=19 ){
  console.log("good evening");
 }else{
    console.log("good night");
 }
```

```
var a = 3, b = 1, c = 5;
undefined
if(a >= b && a >= c){
    console.log("a is high")
}else if(b >= a && b >= c){
      console.log("b is high")
}else{
     console.log("c is high")
}
```

Previously we verified if a>b, with if-else-if we can also check if a == b.

```
var a = 12;
var b = 22;
if(a > b){
  console.log("a is largest");
}else if(a == b){
  console.log("a is equals to b");
}else{
  console.log("b is largest");
}
```

Below program checks, in what range z falls:

```
var z = 150;
if(z<=100){
  console.log("0 - 100");
}else if(z<=200){
  console.log("101 - 200");
}
else if(z<=300){
  console.log("200 - 300");
}
else {
  console.log(">300");
}
```

Program to find largest number among 3 numbers

```
var n1 = 12;
var n2 = 13;
var n3 = 1;

if (n1>=n2)
{
        if(n1>=n3){
            console.log("the largest number", n1);
        }
        else{
            console.log("the largest number", n3);
        }
}
else
{
    if(n2>=n3){
            console.log("the largest number", n2);
    }
    else{
            console.log("the largest number",n3);
    }
}
```

While

```
var count = 1;
while(count <= 16){
    console.log("The number is "+count)
    count = count + 2;
}
```

String concatenation

```
var message = "Hello"
var frnd_name = " Manbir"
var r1 = message + frnd_name
console.log(r1)
```

```
Hello Manbir
```

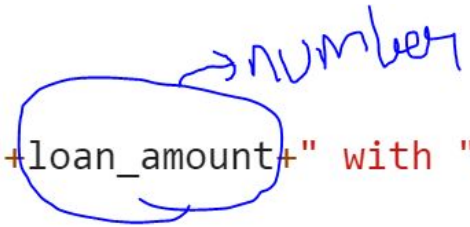
```
undefined
```

```
var message = "Hello"
var frnd_name = "Manbir"
var r1 = message + " " + frnd_name
console.log(r1)
```

```
Hello Manbir
```

With numbers

```
var loan_amount = 3000
var interest = 0.90
var msg = "Mr. Sovindeep has took "+loan_amount+" with "+interest+" per month"
console.log(msg)
```




```
Mr. Sovindeep has took 3000 with 0.9 per month
undefined
```

```
var count = 1;
while(count <= 50){
    if(count%3 == 0){
        console.log(count +" is divisible by 3")
    }
    count = count + 1;
}
```

```
var a1 = [ 9,8,3,4,10,0,1.5, 3, 6 ]
var inx = 0
a1[inx]
```

```
9
```

```
a1[inx]
```

```
9
```

```
while(inx < 9){
    if( a1[inx] >=6){
          console.log(inx +" has passed the course with mark "+a1[inx])
    }
  inx = inx + 1
}
```

```
0 has passed the course with mark 9
```

```
1 has passed the course with mark 8
```

```
4 has passed the course with mark 10
```

```
8 has passed the course with mark 6
```

Length of array

```
var a1 = [ 9,8,3,4,10,0,1.5, 3, 6 ]
var inx = 0
```

```
undefined
```

```
while(inx < a1.length){
    if( a1[inx] >=6){
          console.log(inx +" has passed the course with mark "+a1[inx])
    }
  inx = inx + 1
}
```

For loop

```
var count = 2;
while(count <= 16){
    console.log("The number is "+count)
    count = count + 2;
}
```

(or)

```
for( var count = 2; count <= 16; count = count + 2 ){
   console.log("The number is "+count);
}
```

Example

```
var names = [  "amritpal", "nitin", "jaspreet", "amarjeet", "simranjit" ]
var marks = [    3, 6, 2, 10, 7  ]
for( var count = 0  ;  count < names.length ;  count = count + 1){
    if(marks[count] >= 6){
       console.log(names[count])
    }
}
```