

(I) Warm-up Exercises

Q1. Questions for you to discuss and explore:

- a. What are the differences between `==` and `=`?
- b. Are `a = b;` and `b = a;` doing the same thing?
- c. Can we simplify `if ((a==b) && (b==c))` as `if (a==b && b==c)?`
- d. Can we simplify `if ((a==b) && (b==c))` as `if (a==b==c)?`

Q2. What will be shown by the program on the right?

- A. 1, then 2, then 3, ...
- B. Nothing
- C. The word "frameCount"

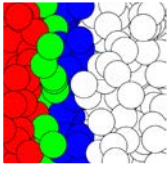
```
function setup() {  
  createCanvas(200, 200);  
  frameRate(1);  
}  
  
function draw() {  
  background(200);  
  text(frameCount, 100, 100);  
}
```

Q3. What will be shown by the program on the right?

- A. When `frameCount` is 1, it paints an ellipse with the color - r: 100, g: 200, b: 0
- B. It shows an ellipse with 3 alternative colors, changing frame by frame.
- C. Nothing will be shown after some frames.

```
function draw() {  
  background(255);  
  var r = (frameCount % 3) * 100;  
  var g = ((frameCount + 1) % 3) * 100;  
  var b = ((frameCount + 2) % 3) * 100;  
  fill(r, g, b);  
  ellipse(100, 100, 50, 50);  
}
```

Q4. [Slide 2] Discussion: Learn from the coding style – Mark the indentation and spacing applied in the following code.



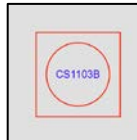
```
function draw() {
  var x = random(300);
  var y = random(300);

  if (x < width/4) {
    fill(255, 0, 0);
  } else if (x < width/3) {
    fill(0, 255, 0);
  } else if (x < width/2) {
    fill(0, 0, 255);
  } else {
    fill(255);
  }

  ellipse(x, y, 50, 50);
}
```

Q5. [Slide 6] If we do not set the drawing modes, we will get the following result. Why?

```
noFill();
strokeWeight(3);
stroke(255,0,0);
```

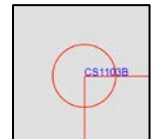


```
rectMode(CENTER); ← This is needed
rect(200,200,240,240); because the default
                        rectangle mode is
                        CORNER

ellipseMode(CENTER); ← This is optional
ellipse(200,200,180,180); since the default
                        ellipse mode is
                        already CENTER

textAlign(CENTER,CENTER); ← This is needed
textSize(30); since the default
noStroke(); text alignment mode
fill(0,0,255); is LEFT,BOTTOM
text("CS1103B",200,200);
```

```
noFill();
strokeWeight(3);
stroke(255,0,0);
```



```
rect(200,200,240,240);

ellipse(200,200,180,180);

textSize(30);
noStroke();
fill(0,0,255);
text("CS1103B",200,200);
```

(II) Working out Class Exercises**Job - 1**

Given Sample program:

```
var x = 0;

function setup() {
  createCanvas(500, 200);
  background(220);
  frameRate(6);
}

function draw() {
  if (x%2 == 1) {
    fill(150);
  } else {
    fill(0);
  }
  rect(50 * x, 0, 50, 200);
  x++;
}
```



(a)

```
var x = 0;

function setup() {
  createCanvas(500, 200);
  background(220);
  frameRate(6);
}

function draw() {

  rect(50 * x, 0, 50, 200);
  x++;
}
```



(b)

```
var x = 0;

function setup() {
  createCanvas(500, 200);
  background(220);
  frameRate(6);
}

function draw() {

  rect(10 * x, 0, 10, 200);
  x++;
}
```

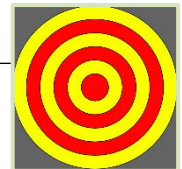


(c)

```
function setup() {
  createCanvas(300, 300);
  background(220);
  frameRate(6);
}

function draw() {

}
```



Job – 2 Rewrite the program to give the required effect.

```
var x = 70;

function setup() {
  createCanvas(300, 300);
  background(0);
  fill(0, 255, 0);
  frameRate(10);
}

function draw() {
  background(0, 100);

  var f = frameCount % 20;

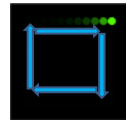
  if (f < 10) {
    x += 20;
  } else {
    x -= 20;
  }

  ellipse(x, height / 2, 20, 20);
}
```



```
function setup() {
  createCanvas(300, 300);
  background(0);
  fill(0, 255, 0);
  frameRate(10);
}

function draw() {
  background(0, 100);
}
```



```
}
```

Job – 3 By trying out or guessing, write down the output of the following statements:

- (a) `text(1234 + 20, 50, 50);` //output _____
- (b) `text(1234 - 20, 50, 80);` //output _____
- (c) `text("cs" + "1103", 50, 110);` //output _____
- (d) `text("1234" + "20", 50, 140);` //output _____
- (e) `text("cs" + 1103, 50, 170);` //output _____
- (f) `text(1234 + "20", 50, 200);` //output _____

Job – 4 Study the following code written by Mary. Line 6 outputs the value of `beFriend`, it displays **true**.

```
1  var kind = true;
2  var polite = true;
3  var clever = true;
4  var handsome = true;
5  var beFriend = kind && polite && clever && handsome;
6  text(beFriend, 50, 50);
```

Output:

true

(a) What will be the output from line 6 if `kind`, `polite`, `clever`, `handsome` are changed as shown below?

(i)

```
var kind = false;
var polite = false;
var clever = false;
var handsome = false;
var beFriend = kind && polite && clever && handsome;
text(beFriend, 50, 50);
```

Output:

(ii)

```
var kind = true;
var polite = true;
var clever = true;
var handsome = false;
var beFriend = kind && polite && clever && handsome;
text(beFriend, 50, 50);
```

Output:

(b) Now Mary's program is rewritten as follow. Explain the behavior of the code.

```
var kind = ..;
var polite = ..;
var clever = ..;
var handsome = ..;
var beFriend = clever || handsome;
if (kind == false) {
  beFriend = false;
}
if (polite == false) {
  beFriend = false;
}
text(beFriend, 50, 50);
```

(c) Redo part (b) so that beFriend obtains the same result in one statement:

kind and polite and clever, or kind and polite and handsome

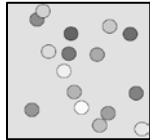
var beFriend = _____;

Complete the following for Job 5-7

Job – 5

```
function setup() {
  createCanvas(300, 300);
  background(225);
  noFill();

```

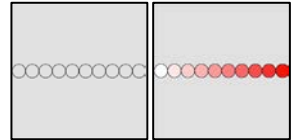


```
}
```

Job – 6

```
function setup() {
  createCanvas(300, 300);
  background(225);
  noFill();

```

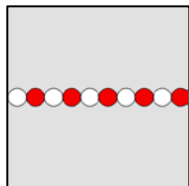


```
}
```

Job – 7

```
function setup() {
  createCanvas(300, 300);
  background(225);
  noFill();

```



```
}
```

Job – 8 Rewrite the following with while-loop and for-loop

```
function setup() {
  createCanvas(200, 150);
  background(225);
  stroke(0);
  line(50, 60, 50, 80);
  line(60, 60, 60, 80);
  line(70, 60, 70, 80);
  line(80, 60, 80, 80);
  line(90, 60, 90, 80);
  line(100, 60, 100, 80);
  line(110, 60, 110, 80);
  line(120, 60, 120, 80);
  line(130, 60, 130, 80);
  line(140, 60, 140, 80);
}
```

while-loop:

```
var x = 50;
while (x <= _____) {
  line(x, 60, x, 80);
  x _____;
}
```

for-loop:**Job – 9** Rewrite the following with while-loop and for-loop

```
var y=0;

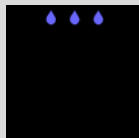
function setup() {
  createCanvas(300, 300);
  fill(100, 100, 255);
  noStroke();
  frameRate(10);
}

function draw() {
  background(0);
  y += 20;

  var x = 100;
  triangle(x, y - 20, x - 10, y - 5, x + 10, y - 3);
  ellipse(x, y, 20, 20);

  x = x + 50;
  triangle(x, y - 20, x - 10, y - 5, x + 10, y - 3);
  ellipse(x, y, 20, 20);

  x = x + 50;
  triangle(x, y - 20, x - 10, y - 5, x + 10, y - 3);
  ellipse(x, y, 20, 20);
}
```

while-loop:for-loop: