Java Programming I

Session 3
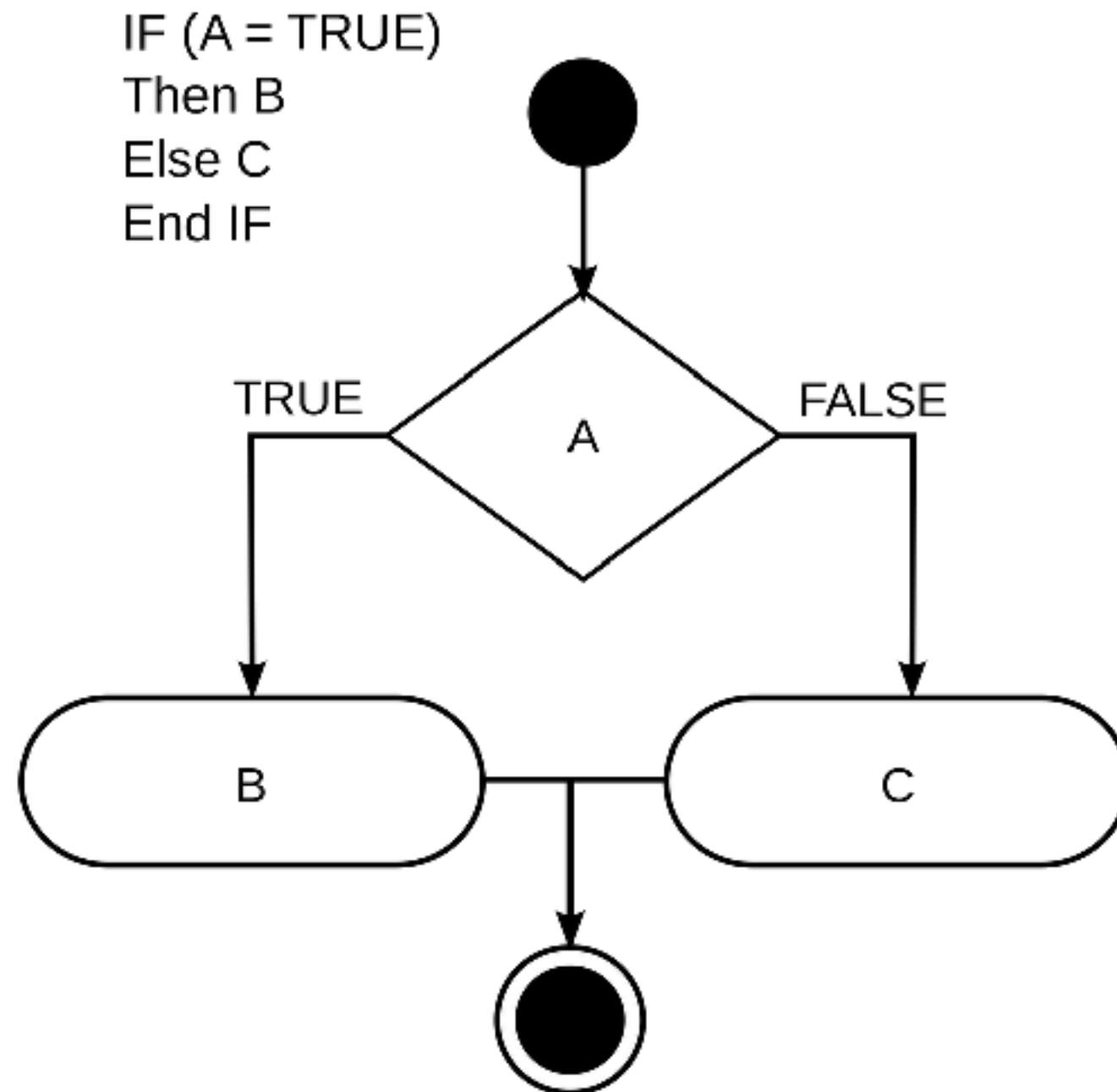
Program Control Statements

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Agenda

- **IF/ELSE STATEMENT**
- **SWITCH STATEMENTS**
- **LOOPS**
- **ARRAYS**
- **STRINGS**

If & else

the basic conditional statement

IF (A = TRUE)
Then B
Else C
End IF

If & else

chose between options

```
if (condition) statement


if (laptop_A.inStock()){
    System.out.println("It is available!");
} else {
    System.out.println("Sorry, it is unavailable!");
}
```

If, else if ..... else

3 or more options

```java
if (laptop_A.quantity == 5){
    System.out.println("We've got plenty");
} else if (laptop_A.quantity == 4) {
    System.out.println("We're running out!");
} else {
    System.out.println("Act now!!");
}
```
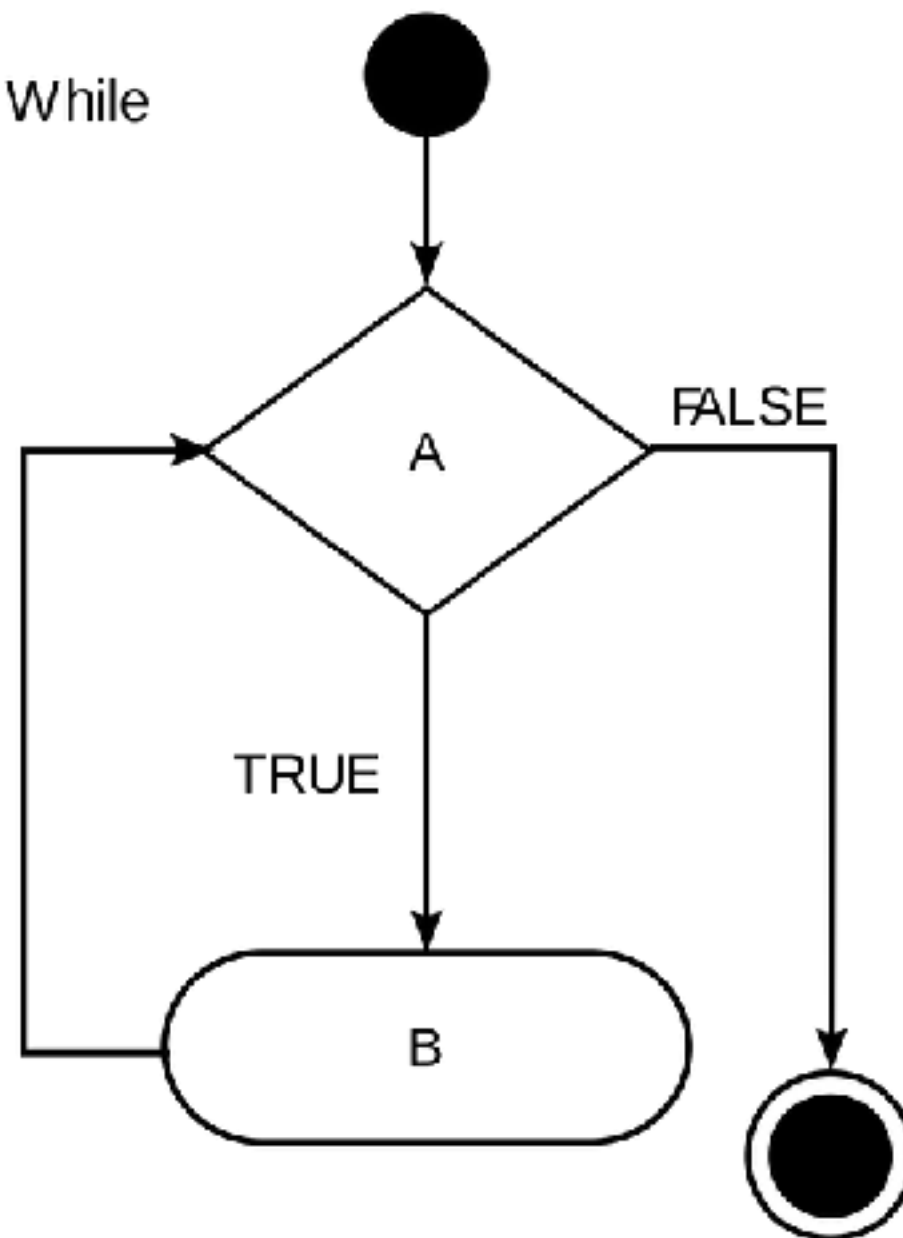
Switch...case

one of many

```
switch (condition) {}
```

```java
switch (laptop_A.quantity){
    case 5:
        System.out.println("We've got plenty");
        break;
    case 4:
        System.out.println("We're running out!");
        break;
    default:
        System.out.println("Act now!!");
}
```

Loops
rinse, wash, repeat

While (A= TRUE) Do
    B
End While

while...

not tied to a counter

```
int x = 0;

while (True){
    if (x > 10){
        break;
    }
    // Do something
    x++;
}
```

do while…

do at least once

```
int x = 0;

do {
    if (x > 10){
        break;
    }
    // Do something
    x++;
} while (True)
```

for

Object oriented no matter what

```
for (init;condition;increment)


for(int x = 0; x < 10; x++){
    // Do something
}
```

for (each)

Object oriented no matter what

```java
for (type name: iterator)

int x[] = {1,2,3};

for (int item : x){
    System.out.println(item);
}
```

break

exit the loop

```java
// Finding a multiple of 3
int x = 3;
while(true){
    int y = (int) (Math.random() * 100);

    if (y % x == 0){
        System.out.println("Found y:" + y + " and x:" + x);
        break;
    }
}
```

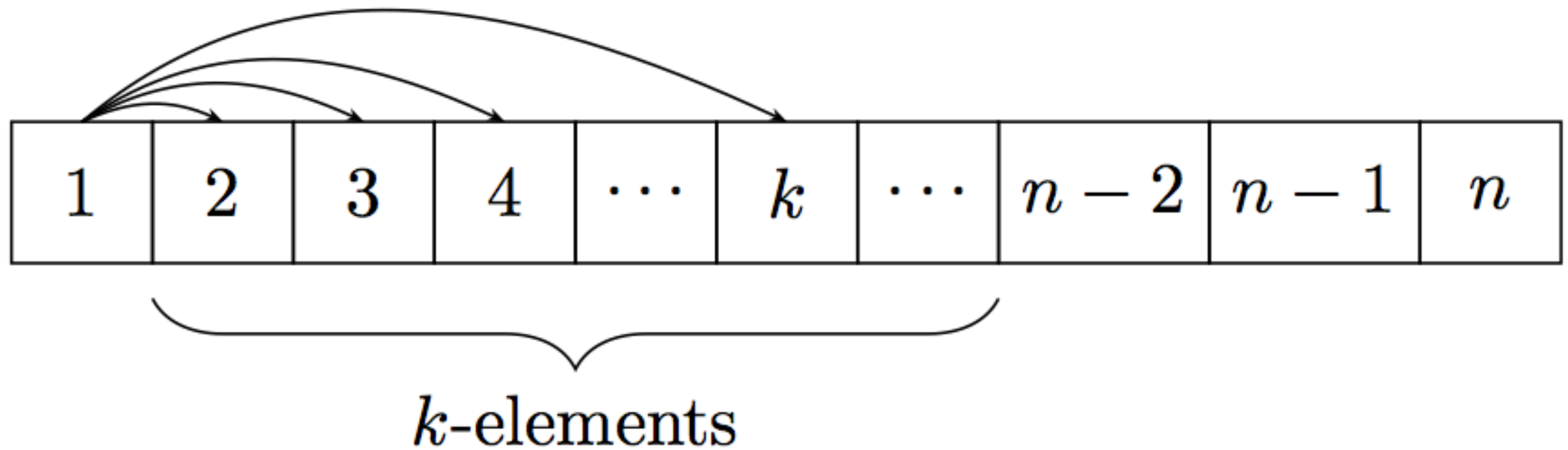# continue

useful for performance

```java
// Once done, don't even process the rest
for(int x = 2; x < 10; x++){
    int y = (int) (Math.random() * 100);

    if (y % x == 0)
    {
        System.out.println("Found y:" + y + " and x:" + x);
        break;
    } else {
      continue;
    }

    // Do something really slow
}
```
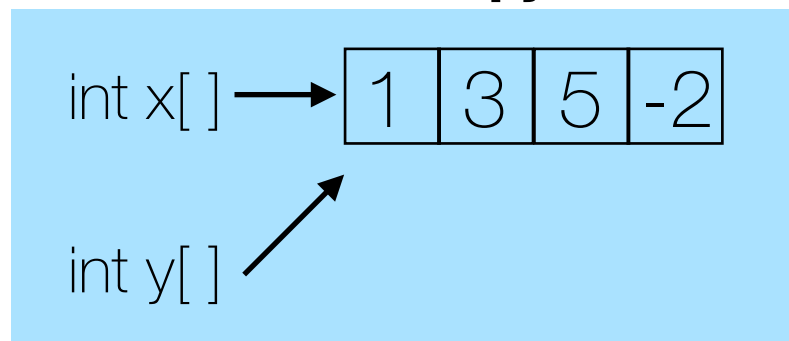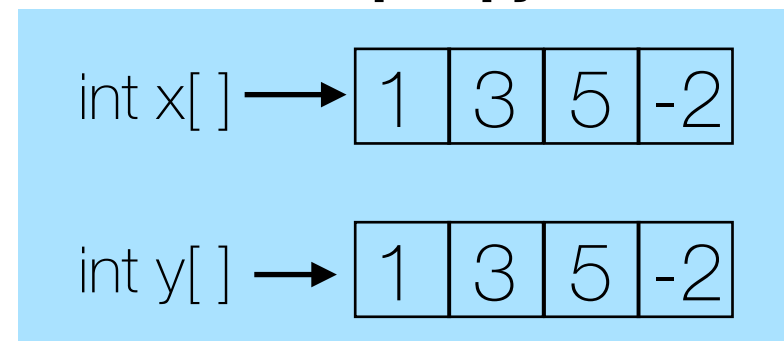
Arrays

a list of elements

Arrays
Special considerations

- Once declared, they cannot change in size
- All elements are one single data type
- Created using a creator (new) or initializer
- Item values have no particular order

shallow copy

int x[ ] → 1 | 3 | 5 | -2

int y[ ]

deep copy

int x[ ] → 1 | 3 | 5 | -2

int y[ ] → 1 | 3 | 5 | -2

Arrays

Read operation

```java
int ages[] = {20,22,23,28,32};

for (int x=0; x<ages.length; x++){
    String msg = String.format("Person #%d = %d",x, ages[x]);
    System.out.println(msg);
}
```

Arrays
Write Operation

```java
int my_array[] = new int[5];
String msg = "After: " + Arrays.toString(my_array)
System.out.println(msg);


for (int x=0; x < my_array.length; x++){
    my_array[x] = x;
}

msg = "After: " + Arrays.toString(my_array);
System.out.println(msg);
```

Arrays
Sort the following

```
int[] ages= {24, 36, 14, 35, 22, 37, 42, 25};
```

Strings

a list of characters

index   0   1   2   3   4   5

String x

H	e	l	l	o	\0

Strings
Special considerations

- They are char arrays. All array considerations apply

- Strings are immutable

- For convenience java provides String object vs char[]

- Strings work with Switch statements

- Strings are not a primitive ("string" == String object)

Strings
String exercises

```java
char data[] = {'R','i','n','g','o'}; // No double quotes for chars
String drummer = new String(data);
String drummer2 = "Rin" + "go";

if(drummer == drummer2){
    System.out.println("Both are ==");
}


if(drummer.equals(drummer2)){
    System.out.println("Both are equal");
}


System.out.println(drummer + " vs " + drummer2);
```

Then

- Compare them using == vs equals method
- Try using the API to replace the R for B
- Try using the API to find out if the string starts with "Bing"
- Try using the API to get the last 4 characters as a string
- Try using the API to remove trailing spaces

Strings
Reverse the following String

```
String title = "Strawberry Fields Forever";
```