Decision Statements

aka If Statements

Decision Statements

- Are a form of control statements
- They control which code is run at which times
- In java, the most common form is an if structure.

An If Statement

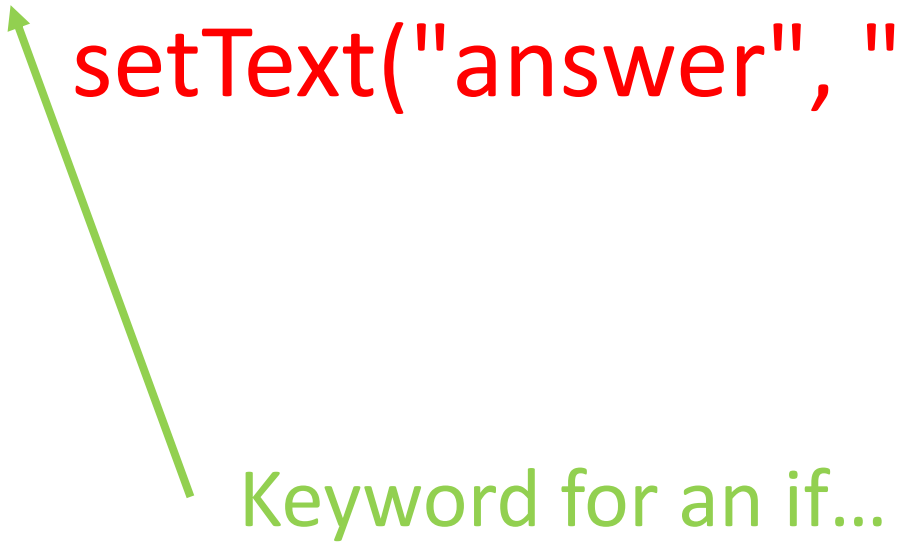
```
var num = promptNum ("Enter a level > ");

if (num >= 2)
    setText("answer", "pass");
```

An If Statement

```
var num = promptNum ("Enter a level > ");

if (num >= 2)
    setText("answer", "pass");
```



An If Statement

```
var num = promptNum ("Enter a level > ");

if (num >= 2)
    setText("answer", "pass");
```

Boolean Expression
If true, the statement runs.

Keyword for an if…

An If Statement

```
var num = promptNum ("Enter a level > ");

if (num >= 2)
    setText("answer", "pass");
```

Boolean Expression
If true, the statement runs.

Code to run if true

Keyword for an if…

An If Statement

```
var num = pro                Enter a level > ");

if (num >= 2)
    setText("answer", "pass");
```

No semi-colon!

Boolean Expression
If true, the statement runs.

Code to run if true

Keyword for an if…

An If/Else Statement

```
var num = promptNum ("Enter a level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

Default = else.
If not the first one, then run this one.

An If/Else Statement

```
var num = promptNum ("Level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

lvl	Printed?
7	

An If/Else Statement

```
var num = promptNum ("Level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

lvl	Printed?
7	Pass
1	

An If/Else Statement

```
var num = promptNum ("Level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

lvl	Printed?
7	Pass
1	Fail
2	

An If/Else Statement

```
var num = promptNum ("Level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

lvl	Printed?
7	Pass
1	Fail
2	Pass
-3	

An If/Else Statement

```
var num = promptNum ("Level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

lvl	Printed?
7	Pass
1	Fail
2	Pass
-3	Fail
81	

An If/Else Statement

```
var num = promptNum ("Level > ");

if (num >= 2)
    setText("answer", "pass");
else
    setText("answer", "fail");
```

lvl	Printed?
7	Pass
1	Fail
2	Pass
-3	Fail
81	Pass

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

In an if/else if structure, the FIRST true statement is run and then it skips to the end.

Nothing else is run once one is true.

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	Great Work!
3	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	Great Work!
3	Great Work!
2	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	Great Work!
3	Great Work!
2	Satisfactory
2.5	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	Great Work!
3	Great Work!
2	Satisfactory
2.5	Satisfactory
1	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	Great Work!
3	Great Work!
2	Satisfactory
2.5	Satisfactory
1	Come for extra help
-45	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
4	Outstanding
3.5	Great Work!
3	Great Work!
2	Satisfactory
2.5	Satisfactory
1	Come for extra help
-45	Come for extra help
90	

If/Else if/Else

```
var num = promptNum ("Level > ");
if (num == 4)
    setText("answer", "Outstanding");
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else
    setText("answer", "Come for extra help");
```

lvl	Printed?
7	Outstanding
6	Great Work!
5	Great Work!
4	Satisfactory
3	Satisfactory
2	Come for extra help
-45	Come for extra help
90	Great Work!

Multi-line Ifs

```
var num = promptNum ("Level > ");
if (num == 4) {
    setText("answer", "Outstanding");
    setText("answer2", "Top level in class");
}
else if (num >=3)
    setText("answer", “Great Work”);
else if (num>=2)
    setText("answer", "Satisfactory");
else {
    setText("answer", "Come for extra help");
    setText("answer2", "Review study techniques.");
}
```

Multi-line ifs require {} to set up a region of code.

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	fish
3	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	fish
3	snail
4	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	fish
3	snail
4	snail
2	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	fish
3	snail
4	snail
2	pineapple
-1	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	fish
3	snail
4	snail
2	pineapple
-1	pineapple
90	

Tracing

```
var x = promptNum ("X? ");
if (x == 6)
    setText("answer", "turtle");
else if (x > 4)
    setText("answer", "fish");
else if (x > 2)
    setText("answer", "snail");
else
    setText("answer", "pineapple");
```

x	Printed?
6	turtle
5	fish
7	fish
3	snail
4	snail
2	pineapple
-1	pineapple
90	fish

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	AC
10	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	AC
10	AC
5	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	AC
10	AC
5	BD
2	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	AC
10	AC
5	BD
2	BE
90	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	AC
10	AC
5	BD
2	BE
90	AC
-3	

Tracing

```
var y = promptNum ("Y? ");
var words;
if (y >= 8)
    words = words +"A";
else if (y <= 15)
    words = words +"B";
if (y >= 10)
    words = words +"C";
else if (y >= 5)
    words = words +"D";
else
    words = words +"E";
setText("answer", words);
```

y	Printed?
9	AD
8	AD
16	AC
15	AC
10	AC
5	BD
2	BE
90	AC
-3	BE