Lec 5

APIs, Variables (continued), Strings, and Conditionals
HW2

<table>
<thead>
<tr>
<th>void</th>
<th>setPenWidth(int width)</th>
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<tbody>
<tr>
<td>void</td>
<td>setPicture(Picture pict)</td>
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<tr>
<td>void</td>
<td>setShellColor(java.awt.Color color)</td>
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<tr>
<td>void</td>
<td>setShowInfo(boolean value)</td>
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<tr>
<td>void</td>
<td>setVisible(boolean value)</td>
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<tr>
<td>void</td>
<td>setWidth(int theWidth)</td>
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<tr>
<td>void</td>
<td>show()</td>
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<tr>
<td>java.lang.String</td>
<td>toString()</td>
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<td>void</td>
<td>turn(double degrees)</td>
</tr>
<tr>
<td>void</td>
<td>turnLeft()</td>
</tr>
<tr>
<td>void</td>
<td>turnRight()</td>
</tr>
<tr>
<td>void</td>
<td>turnToFace(int x, int y)</td>
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Which of these methods will allow you to turn 15 degrees?
Constants

• If you know a variable that should never change value
• Variable name should be all caps with “_” between words

final type VARIABLE_NAME = value;
Magic Numbers

• No hard coding constants
• “1” or “2”... that’s ok, e.g. `var = index + 1;`

```
int w_angle = 83;
turn(w_angle);
```
Explicit typecasting vs. Implicit typecasting

• Java has specific rules for handling mixing of types

• To help programmer get the answer they expect, can explicitly state desired type (type) expression, e.g.
  ```java
  int j = (int) 'C';
  ```
double-to-int

• Never implicit (actually, more complicated than that)
  – int i = 3.2; // results in compiler error
  – int i = (int) 3.2; // results in i = 3

• Why does int i = 5/2; result in i = 2 and not a compiler error?
int-to-double

What gets printed

```java
int i = 5;
int j = 2;
System.out.println(i/j);
System.out.println((double)i/j);
System.out.println((double)(i/j));
```

A) 2   B) 2.5   C) 2   D) 2.5   E) none of the above

2.0   2.5   2.5   2.0
2.0   2.5   2.0   2.0
Strings

String course = "CSE" + " 11";
course += "!";

//course = "CSE 11!"
String name = "Adam"
String result1, result2;
int i = 10;
result1 = i + 1 + name;  //11Adam
result2 = name + i + 1;  //Adam101
```
int a = 2;
int b = 4;
int c = 6;
System.out.println((a + b) + c + " = " + a + b + c);
System.out.println(a + (b + c) + " = " + (a + b) + c);
System.out.println(a + b + c + " = " + a + (b + c));

A) 12 = 12  B) 12 = 246  C) 246 = 246  D) 12 = 246  E) none
   12 = 12  12 = 66  246 = 246  12 = 246  of the
   12 = 12  12 = 210  246 = 246  12 = 246  above
```
if statements
if else statements

- if condition is true:
  - execute statement(s)

- if condition is false:
  - execute statement(s)

- continue with the rest of the code
QUERY "Temperature of water? ", Temp

True  Temp <= 0  False

WRITE "Poten"

True  Temp <= 12  False

WRITE "Cold"

True  Temp <= 25  False

WRITE "Warm"

WRITE "Hot"

True  Temp <= 75  False

WRITE "Very hot"

True  Temp <= 100  False

WRITE "Burning"
if (condition) {
    // code
}
// rest of program
Syntax

if (condition) {
    //code
}
else {
    //code
}
What gets printed?

```java
i=10; j=5; z=2;
if(i == 10) {
    if(i < j)
        z *= 2;
} else {
    z *= 4;
}
System.out.println("z=" + z);
```

A) z=2  B) z=4  C) z=4  D) z=2  E) z=8

z=2  z=4  z=8  z=8  C.E.
if – else-if

```
grade = null, score = 85

score >= 90

score >= 80

score >= 70

score >= 60

grade = 'A'

grade = 'B'

grade = 'C'

grade = 'D'

grade = 'F'

continue with program
```
if else-if syntax

if (condition) {
    //code
}
else if (condition) {
    //code
}
else if (condition) {
    //code
}
else {
    //code
}
Conditions

• <, >, <=, >=, ==, !=
  – Note: =>, =<, =! Will give compiler errors

• = is not the same as ==
What’s the value of exp1?

int a = 7;
int b = -1;
int c = 2;
boolean exp1 = !(b + a * c >= a + c * b);

a) true  b) false  c) C.E.  d) False  e) B and D are the same
What’s the final value of z?

```plaintext
i=20; z=2;
if(15 < i < 25) {
    z++;
}
else {
    z--;
}
```

A) 2  B) 3  C) 1  D) C.E.  E) None of the above
Logical Operators

a && b -- a AND b. both must be true

a || b – a OR b. One or both must be true

!a – NOT a. flips a
Which of these evaluates to true

```java
int i = 10;
char c = 'A';
a) i > 10 || i < 20
b) !(i > 10 && i < 20)
c) i*7+c/2 > 34 || c == 'A'
d) a and c
e) All of the above
```