

## CSC 142

### Standard input/output

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### Console Output

- Use the static `PrintStream` object `out` in `System`  
`System.out.println("Hello, world");`
- Recall: use `+` to concatenate Strings  
`//If name is a String variable`  
`System.out.print ("I am "+name);`  
`//Warning: + means concatenation or addition`  
`//java reads the expression left to right.`  
`//If the 2 operands are numbers, do an`  
`//addition. If one of them is a String, do`  
`//a concatenation (making the number a String)`  
`System.out.print("1+3="+1+3); //prints 1+3=13`  
`System.out.print(1+3+"=1+3"); //prints 4=1+3`  
`System.out.print("1+3="+1+3); //prints 1+3=4`

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### Console Input

- In `System`, `BufferedInputStream` object in
  - as is, to input a stream of bytes
  - can be made into an object to read Strings directly. But some knowledge about exceptions is required.
- Instead use a class where all of the work is already done

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### Classes for input

- `Scanner` (in `java.util`)  
`Scanner input = new Scanner(System.in);`  
`System.out.print("Enter your age: ");`  
`int i = input.nextInt();`  
`// other methods: nextDouble,`  
`// nextLine (for a string),...`
- `Input` (in `uwcse.io`)  
`Input input = new Input();`  
`int i = input.readInt("Enter your age: ");`  
`// other methods: readDouble, readString,...`

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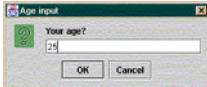
### Output using GUI objects

- Many graphics objects can display text (check the documentation). Two examples:
  - `JOptionPane` class (in `javax.swing`)  
`JOptionPane.showMessageDialog`  
`( null, "Hello, \nWorld!", "This is the title",`  
`JOptionPane.INFORMATION_MESSAGE);`  
`parent`  
`window`  
`or null if no`  
`parent`  
`//last 2 actual parameters may be omitted`
  - In a `GWindow` object: `window`  
`// Display "Hello" at location (30,60)`  
`window.add(new TextShape("Hello", 30,60));`



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### Input using GUI objects (1)

- `JOptionPane` class (in `javax.swing`): Hard way  
`String s = JOptionPane.showInputDialog`  
`( null, "Your age? ", "Age input",`  
`JOptionPane.QUESTION_MESSAGE);`
- 
- `// Always get a String (possibly null).`
  - `// To extract the int, use parseInt in Integer.`
  - `int age = Integer.parseInt(s);`
  - `// parseInt gives an error if s doesn't have an`
  - `// integer format. Fix: use exceptions`

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## Input using GUI objects (2)

- In Input from uwce.io : easy way

```
Input input = new Input();  
int age = input.readIntDialog("Age?");
```



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## Formatting output (1)

- Use classes from java.text
  - we have seen DecimalFormat

```
DecimalFormat d = new DecimalFormat("0.00");  
// 2 digits after the decimal point  
String s = d.format(3.136); //s is "3.14"
```
  - for a currency amount

```
NumberFormat c;  
c = NumberFormat.getCurrencyInstance();  
String s = c.format(1001.34);  
//s is "$1,001.34" (in the US)
```
  - Many other classes, e.g. for a date: DateFormat
- Check the documentation

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## Formatting output (2)

- Use formatting strings (convenience for C programmers)

```
String s = String.format("%3.2f", 3.136);  
//s is 3.14  
System.out.printf("%3.2f", 3.136);  
// prints 3.14  
System.out.printf("$%,.2f", 1001.34);  
// prints $1,001.34
```

- Check the documentation (look for printf in java.io.PrintStream)

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