Basic IO & Data Types

Primitive Data Types

OOP1

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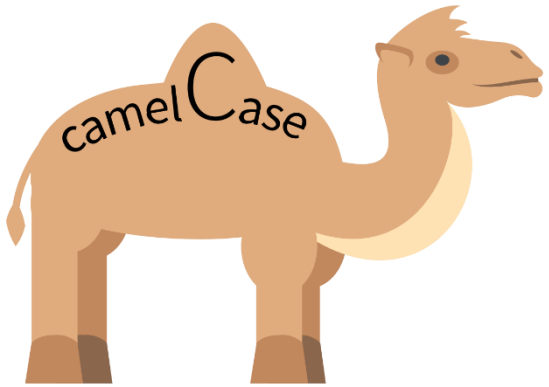
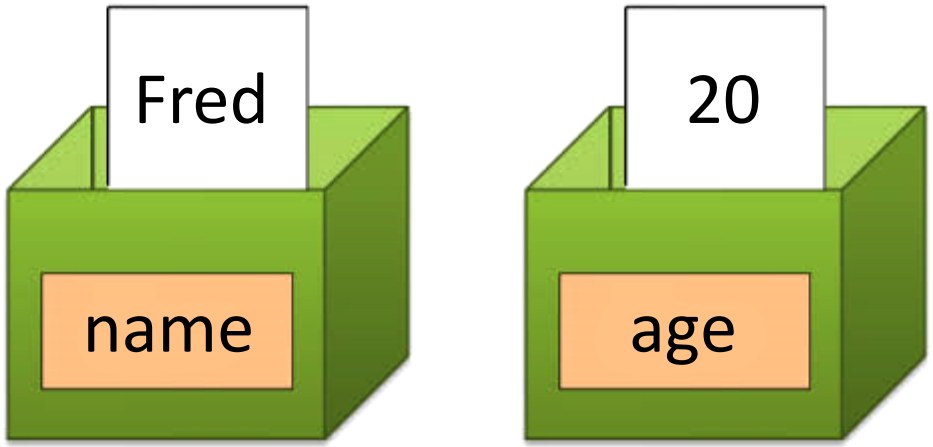
Variables

- What is a variable?
  - Moving boxes: storage, label, contents
- Declaring a variable in **Java**:
  1. **Data type**
  - What kind of information
  1. **Variable's name**
  - Label of the box
  - Must be in **camelCase**
  2. **Equals sign**
  3. **Value**
  - Actual Data






```
String name = "Fred";    int age = 20;
```

Java Variables VS Python Variables

NOOOOOO!
YOU CAN'T STORE
a **FLOAT** IN AN **INT** VARIABLE

You've assigned a
String to an **int** variable?
No problem!

Primitive Data Types

What data type would you use for:

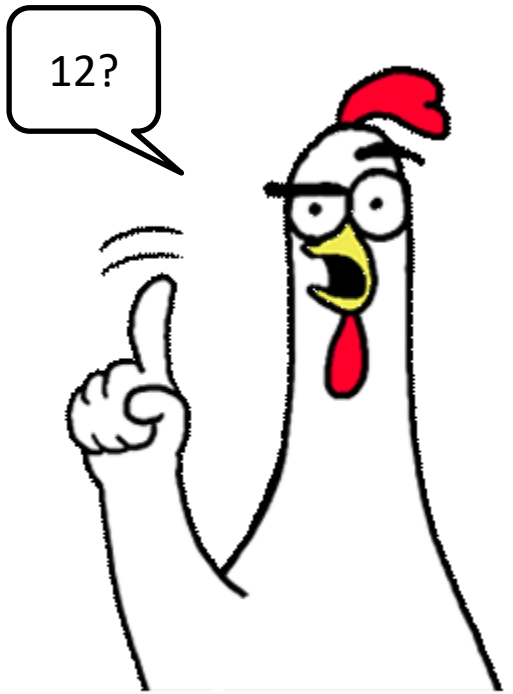
- Year? e.g. 2018
- Weight? e.g. 1.5 lbs
- True/False? e.g. door is open
- Name? e.g. Fred
  - Strings are **objects** of the **class** `String`
  - Represent a **sequence of** `char`

Data Type	Size	Description
`int`	32 bits	**Whole numbers** from -2,147,483,648 to 2,147,483,647
`long`	64 bits	**Whole numbers** from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
`float`	32 bits	Stores **fractional numbers**. Sufficient for storing 7 decimal digits
`double`	64 bits	Stores **fractional numbers**. Sufficient for storing 14 decimal digits
`boolean`	1 bit	Stores **true** or **false** values
`char`	16 bits	Stores a **single character** (letter)

Primitive Data Types

- But what could go wrong?
  - Said the engineer that used `String` for calculations!

```
Enter first number: 1
Enter second number: 2
1 + 2 = 12
Press [enter] to exit:
```



Primitive Data Types

- But what could go wrong?
  - Said the engineer that used `int` instead of `double`
  - Lost **decimal precision** in calculations

Example: `int result = 7 / 2;`

`result =`

Primitive Data Types

- But what could go wrong?
  - Extrapolating the allocated data size can bring **unexpected results**
  - E.g. the **Far Lands** in **Minecraft** exceed the `int` limits of the X,Y,Z coordinates

Input in Java

1. Using `next()`, will get input up to next **space** or **newline**

```
firstName = scanner.next();     // Gets just the first name
lastName  = scanner.next();     // Gets just the last name
fullName  = scanner.next();     // Problem: Gets only the first name!
```

2. Using `nextLine()`, gets the **entire line** as a string
   - Just like Python's `input()`

```
fullName = scanner.nextLine(); // Gets the whole name as string
```

3. Using `nextInt()`, converts the input automatically to the correct data type

```
age = scanner.nextInt();        // Convert string input to int
```

Output in Java

1. Using `println()` works like **Python** `print()`
   - End with a newline
   - There's **no string interpolation** `"{variable}"` in Java 🙄
   - Can get very long!

```
System.out.println("Hello " + fullName + " you are " + age + " years old");
```

2. Using `printf()` → **f** means **formatted**
   - End without a new line
   - Use `%s` in place of a variable, it will **convert to string** automatically

```
System.out.printf("Hello %s you are %s years old\n", fullName, age);
```

ICE 1 – Student Registration (Input)

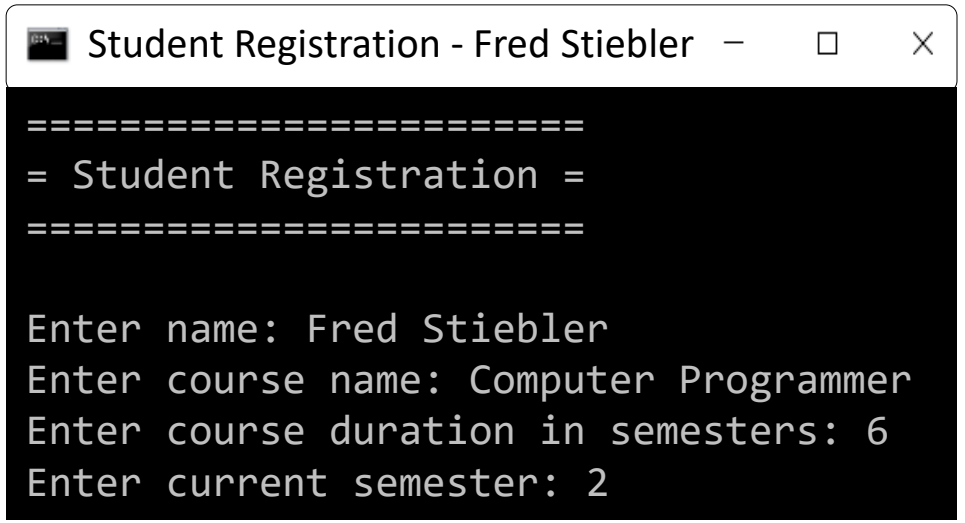
Write a Java program that:

1. Set the **Console window title** to `App Name - Your Name`
2. Print the **registration banner**
3. Prompt for student information

   Name, course name, course duration, current semester

   – Store user input in **variables**

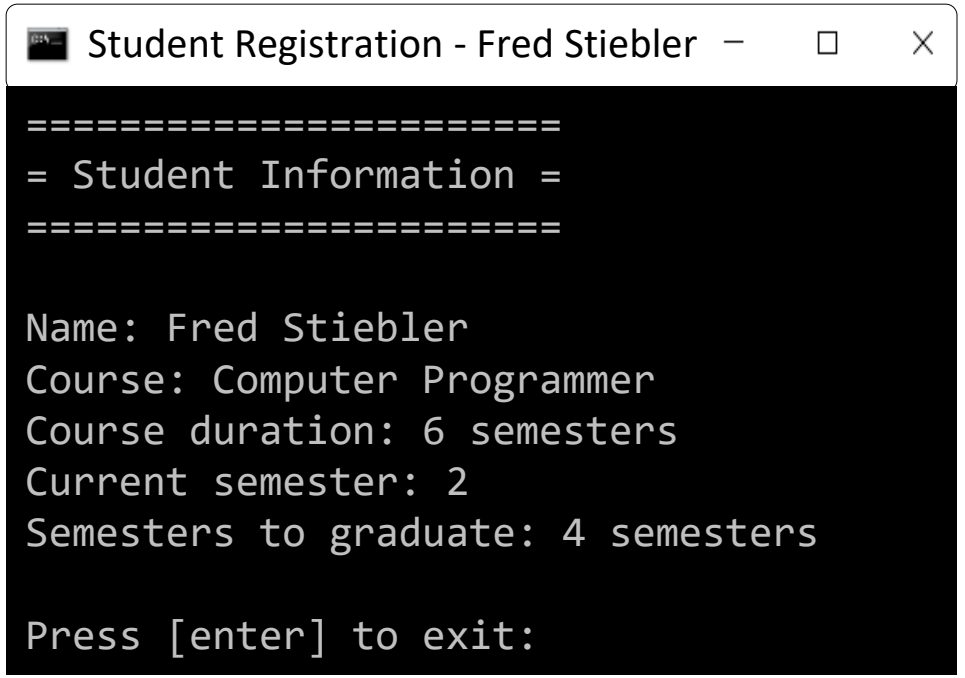
   ⚠️ **Make sure to use the proper data type!**



ICE 1 – Student Registration (Output)

Write a Java program that:

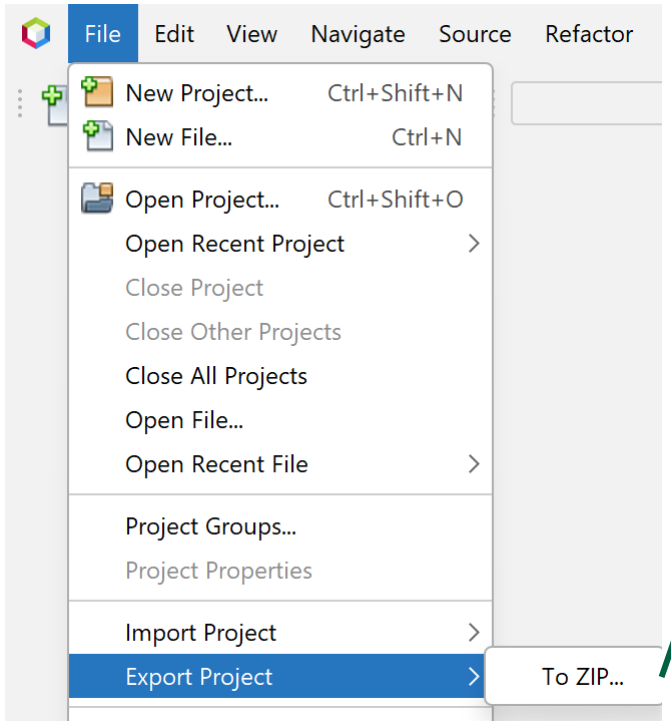
5. **Clear** console window
6. Print the **information banner**
7. **Calculate** semesters left to graduate.
8. Display the complete student information
9. Write the **exit prompt**
   💡 `"Press [enter] to exit: "`

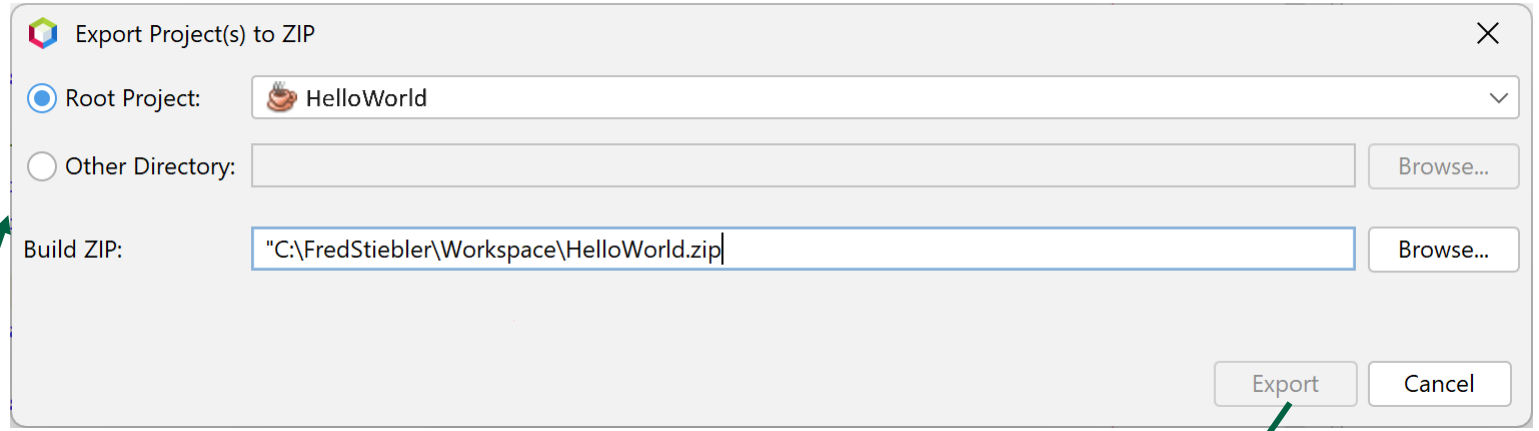


ICE Submission

Zipping your NetBeans project

- File → Export Project → Export → ProjectName.zip





HelloWorld.zip

ICE Submission

Complete all steps in the report

- Detailed **report instructions** in the **Content** area of **DC Connect**
- **Complete all steps in the report**
- **Deadline** posted on **DC Connect**

Submit the **Java Project** and the **PDF report** to DC Connect

⚠️ Upload the ZIP and PDF **separately**!

NetBeansProject.zip

Report.pdf