Lecture # 5

User Input

Introduction to Programming

Introduction

- So far we have used variables to hold values which are specified by the programmer
- These values are hardcoded into the program, and remain the same each time the program is run
- It is possible to allow the user of the program to enter their own values, and for the program to act on these values.
- Java 5 and above uses the **Scanner** class to achieve this

Getting user input

- Different values can be assigned to variables every time a program is run
- The user is prompted to input values, which are then assigned to variables
- This allows for a lot of flexibility in your programs
- E.g. Instead of always adding two particular numbers, a program can add any two numbers

Program to add two integers

```
public class AddNumbers
{
  public static void main(String[ ] args)
  {

     int num1, num2, answer;

     num1 = 2;
     num2 = 3;

     answer = num1 + num2;
     System.out.println("The answer is: " + answer);

   }
}
```

Getting user input

- The **Scanner** class is used to take in data from the keyboard
- To use the `Scanner` class, you need to import it from an external java package called `util` (*utilities)*
- The import statement must appear at the start of your program

```
import java.util.Scanner;
```

The Scanner class

- To use the `Scanner` class you then need to declare a `Scanner` object

```
Scanner keyboardIn = new Scanner(System.in);
```

- The `Scanner` variable `keyboardIn` is then used to read data from the keyboard

The Scanner class

- A value can be input to a variable by accessing the appropriate **method** for the Scanner object:

```
variable = keyboardIn.next Type();
```

E.g. To read in an **int**;

```
number = keyboardIn.nextInt();
```

E.g. To read in a **double**;

```
price = keyboardIn.nextDouble();
```

The input methods of the *Scanner* class	
Java type	**nextType method**
int	`nextInt()`
long	`nextLong()`
float	`nextFloat()`
double	`nextDouble()`
char	`next().charAt(0)`
String	`nextLine()` or `next()`

Program to add any two integers

```
import java.util.Scanner;
public class AddIntegers
{
    public static void main(String[ ] args)
    {
      Scanner keyboardIn = new Scanner(System.in);

      int num1, num2, answer;

      System.out.print("Enter the first number: ");
      num1 = keyboardIn.nextInt();
      System.out.print("Enter the second number: ");
      num2 = keyboardIn.nextInt();

      answer = num1 + num2;
      System.out.println("The answer is: " + answer);
    }
}
```

Program to add any two doubles

```
import java.util.Scanner;
public class AddDoubles
{
    public static void main(String[ ] args)
    {
      Scanner keyboardIn = new Scanner(System.in);

      double num1, num2, answer;

      System.out.print("Enter the first number: ");
      num1 = keyboardIn.nextDouble();
      System.out.print("Enter the second number: ");
      num2 = keyboardIn.nextDouble();

      answer = num1 + num2;
      System.out.println("The answer is: " + answer);
    }
}
```

Program to read in two characters

```
import java.util.Scanner;
public class ReadInitials
{
    public static void main(String[ ] args)
    {
      Scanner keyboardIn = new Scanner(System.in);

      char init1, init2;

      System.out.print("Enter your first initial: ");
      init1= keyboardIn.next().charAt(0);
      System.out.print("Enter your second number: ");
      init2= keyboardIn.next().charAt(0);

      System.out.print("Hello " +init1 +" " +init2);
   }
}
```

The String class

- A **String** is a sequence of characters enclosed by quotation marks.
- For example “Hello World”, and “John” are both Strings.
- A String is an Object type. We will be studying this type in detail in Semester 2.
- For now, we can use Strings in a basic manner.

The String data type

- A String example:

```
String firstName;
firstName = "Sam"

System.out.println("Name: " + firstName);
```

Program to read in two Strings

```
import java.util.Scanner;

public class FullName
{
    public static void main(String[ ] args)
    {
       Scanner keyboardIn = new Scanner(System.in);

       String fName, sName;

       System.out.print("Enter your first name: ");
       fName = keyboardIn.nextLine();
       System.out.print("Enter your second name: ");
       sName = keyboardIn.nextLine();

       System.out.println("Hello " +fName +" " +sName );
    }
}
```