Write your name below and indicate your role,

Project Manager (PM), Recorder (R)

Name _____ Role _____

Name _____ Role _____

# Number Systems

## Your Tasks (Mark these off as you go)

- ☐ Practice converting between number systems
- ☐ Have Ms. Pluska check off your tasks
- ☐ Write a program that prompts the user for input
- ☐ Write a program that converts a binary number to decimal
- ☐ Determine the number of digits in a number
- ☐ Write a program that coverts a base 10 number to binary
- ☐ Receive credit for the group portion of this lab

## ☐ Practice converting between number systems

Complete the following conversions. Show your work to the write so I can see your thinking.

| Octal | Decimal |
|---|---|
| 107 | |
| 125 | |

| Decimal | Octal |
|---|---|
| 142 | |
| 148 | |

| Hex | Decimal |
|---|---|
| FA9 | |
| 42A | |

| Decimal | Hex |
|---|---|
| 189 | |
| 344 | |

| Decimal | Binary |
|---|---|
| 32 | |
| 23 | |

| Binary | Decimal |
|---|---|
| 11001 | |
| 11100 | |

## ☐ Have Ms. Pluska check off your tasks before you continue


Before you continue have Ms. Pluska check off the above tasks

Do not continue until you have Ms. Pluska's (or her designated TA's)

signature _____

## ☐ Write a program that prompts the user for input

Prompt the user to provide the base or number system that they are converting from, the base or number system that they are converting to, and the number they would like to convert. Be sure to store their responses in the appropriate variables.

```
public class NumberSystems {
    public static void main(String args[]) {
            Scanner input = new Scanner(System.in);









      }
}
```

## □ Write a program that converts a binary number to decimal

Assume int binNum stores a binary number. Consider how you might convert the following binary number, 1110001. Use a loop to write code to convert binNum to decimal. Store the converted number in a variable called result.

```
public class BinToDecimal{

     public static void main(String args[]){









   }
}
```

## □ Determine the number of digits in a number

The following code could be used to determine the exponent of the base for the last digit in the binary number.

```
int i = 0;
while ((Math.pow(2, i)) <= num) {
      i++;
}
i--
```

| |
|---|
| a. Write code that code be used to determine the number of digits in a base 10 number.<br>b. Write code that code be used to determine the number of digits in a binary number |
| |

## ☐ Write a program that converts a base 10 number to binary

Assume int base10 stores a base 10 number. Consider how you might convert the following base 10 number, 142 to binary. Use a loop to write code to convert base10 to binary. Store the converted number in a variable called result.

```
public class DecimalToBin{

     public static void main(String args[]){









   }
}
```

## ☐ Receive Credit for the group portion of this lab


Before you submit your lab have Ms. Pluska check off the above tasks

Do not continue until you have Ms. Pluska's (or her designated TA's) signature _____