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Class (Section)   IST 140.____

Practice Problems 4.2

More Intense Look at Loops

WHAT IS THE OUTCOME?

For each problem, give the value of the given variable after the code snippet is complete

1)
```
int product = 1;

for(int i = 1; i < 3; i++){
   for(int j = i; j < 3; j++){
      product *= i + j;
   }
}
```

i	j	i + j	sum
1	1	2	2
1	2	3	5
2	2	4	9

product ==   2,6,24

2)
```
int product = 1;

for(int i = 1; i < 3; i++){
   for(int j = i; j < 4; j++){
      product *= i + j;
   }
}
```

i	j	i + j	sum
1	1	2	2
1	2	3	5
1	3	4	9
2	2	4	13
2	3	5	18

product ==   2,6,24,96,480

3)
```
int product = 1;

for(int i = 1; i < 4; i++){
   for(int j = i; j < 3; j++){
      product *= i + j;
   }
}
```

i	j	i + j	sum
0	0	0	0
1	1	2	2
1	2	3	5
2	2	4	9

product ==   2,6,24

WRITING LOOPS

For each problem, write the code snippet that satisfies all the traits given. You can assume the ranges are inclusive and you don't need to repeat information already given. The first is given as an example:

4) Prints the sum of all the even numbers between 2 and 20
Use a while loop

```
int num = 1;
int sum = 0;

while(num <= 10){
   int evenNum = 2 * num;
   sum += evenNum;
   num++;
}

System.out.println(sum);
```

5) Prints the sum of all even numbers between 2 and 100
Use a do-while loop

```
int i = 2;
int sum = 0;

do {
    System.out.println(i);
    i = i+2;
    } while (i <= 100);
```

6) Prints all the powers of 2 from 2^0 through 2^{20}
Don't worry about rounding
Use a for loop

```
int i;
double product;

        for (i = 2; i < 20; i++) {
            product = Math.pow(2,i);
            System.out.println(product);
        }
```

7) Prints the sum of all the numbers between a and b where a and b are user inputs
Use any loops you want

```
        int a = scnr.nextInt();
        int b = scnr.nextInt();
        int sum = 0;

        while (a < b) {
            sum += (b - a);
            System.out.println(sum);
            a = a++;
```

8) Challenge Option!
Prints the sum of all the odd numbers between a and b where a and b are user inputs
Use any loops you want

```
int a = scnr.nextInt();
int b = scnr.nextInt();

while(a <= b){
   int OddNum = 2 * num;
   sum += OddNum;
   num++;
}

System.out.println(sum);
```