**Problem Solving and Programming**

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**Assignment #4 Exercises**

1. **Write a fragment of code that will read words from the keyboard until the word done is entered. For each word except done, report whether its first character is equal to its last character. For the required loop, use a**
   1. **while statement**
   2. **do-while statement**

**While Statement**

import java.util.Scanner;

public class Main

{

public static void main(String[] args)

{

String word = “”;

System.out.println(“Enter the word you want: ”);

Scanner keyboard = new Scanner(System.in);

word = keyboard.next();

do

{

if(word.charAt(0) == word.charAt(word.length()-1))

System.out.println(“First character is equal to the last character in the word: ” + word + “.”);

else

System.out.println(“First character is not equal to the last character in the word: ” + word + “.”);

word = keyboard.next();

}while(!word.equals(“done”));

}

}

**Do-While Statement**

import java.util.Scanner;

public class Main

{

public static void main(String[] args)

{

String word = “”;

System.out.println(“Enter the word you want: ”);

Scanner keyboard = new Scanner(System.in);

word = keyboard.next();

while(!word.equals(“done”))

{

if(word.charAt(0) == word.charAt(word.length()-1))

System.out.println(“First character is equal to the last character in the word: ” + word + “.”);

else

System.out.println(“First character is not equal to the last character in the word: ” + word + “.”);

word = keyboard.next();

}

}

}

1. **Convert the following code so that it uses nested while statements instead of for statements:**

int s = 0;

int t = 1;

for(int i = 0; i < 10; i++)

{

s = s + I;

for(int j = I; j > 0; j--)

{

t = t \* (j - i);

}

s = s \* t;

System.out.println(“T is ” + t);

}

System.out.println(“S is ” + s);

**Code in nested while loop.**

int s = 0;

int t = 1;

int i = 0;

while(i<10)

{

s = s + i;

int j = i;

while(j>0)

{

t = t \* (j – i);

j--;

}

s = s \* t;

System.out.println(“T is ” + t);

}

System.out.println(“S is ” + s);

1. **Write a for statement to compute the sum 1 + 2^2 + 3^2 + 4^2 + 5^2 + … n^2.**

int sum = 0;

for(int i = 1; i <= n; i++)

{

sum += i \* i;

}

1. **Write a loop that will create a new string that is the reverse of a given string.**

for(int i = originalString.length()-1; i >= 0; i--)

{

reverseString += originalString.charAt(i);

}

System.out.print.ln(“The original string is: \n” + “\”” + originalString + “\””);

System.out.println(“The reverse of the original” + “string is: \n \”” + reverseString + “\””);

1. **What does the following fragment of code display? What do you think the programmer intended the code to do, and how would you fix it?**

int product = 1;

int max = 20;

for(int i = 0; i <= max; i++)

product = product \* i;

System.out.println(“The product is ” + product);

This fragment will display 0 (zero) as the result. I think the programmer wanted to get the product of the first 20 numbers.

This can be fixed with this code.

int product = 1;

int max = 20;

for(int i = 1; i <= max; i++)

product = product \* i;

System.out.println(“The product is ” + product);

1. **What does the following fragment of code display? What do you think the programmer intended the code to do, and how would you fix it?**

int sum = 0;

intproduct = 1;

int max = 20;

for(int i = 1; i <= max; i++)

sum = sum + i;

product = product \* i;

System.out.println(“The sum is ” + sum + “ and the product is “ + product);

This fragment will display “The sum is 210 and the product is 1”. I think the programmer wanted to get the sum and product of the first 20 numbers.

This can be fixed with this code.

int sum = 0;

int product = 1;

int max = 20;

for(int i = 1; I <= max; i++)

{

sum = sum + i;

product = product \* i;

}

System.out.println(“The sum is ” + sum + “ and the product is ” + product);