# CS 110, Spring 2018

# Homework 3, Due 3/8/2019, 55 points

# 5 points per problem

**What is the output of each of the following problems, USE as tract table to show the execution of the loop and the output produced. TO RECEIVE CREDIT YOU MUST SHOW YOUR WORK VIA A TRACE TABLE.**

1. Assuming the user inputs 1, what is the value of the variable a after the code executes:

**int a=0;**

**Scanner input = new Scanner(System.in);**

**System.out.println(“enter an integer number between 1 and 8”);**

**a = input.nextInt();**

**if (a > 0 && a <= 8){**

**switch (a){**

**case 1:**

**a = a + 3;**

**case 2:**

**a = a - 3;**

**case 3:**

**a++;**

**break;**

**case 5:**

**a--;**

**break;**

**case 6:**

**a = a \* 2;**

**case 8:**

**a = a / 2;**

**break;**

**default:**

**a = 0;**

**}// end switch**

**}// end if**

1. Assuming

int i=5 , sum = 0;

while (i>=0){

sum = sum + i \* 2;

i--;

}

System.out.println(sum);

1. Assuming:

int x = 2, y = 15;

do {

System.out.println(x + “ “ + y);

x = x + 1;

y = y - 1;

} while (x<y);

System.out.println(x + “ “ + y);

1. Assuming

**int j=2;**

**for(int i=0; i < = 5; i++){**

**System.out.print( j + “ \* “ );**

**j = 3 \* j - 2;**

**}**

1. Assuming

**int firstNum = 25, secondnum = firstNum % 3 ;**

**while( firstNum <= 55){**

**if ( firstNum%2 == 0)**

**System.out.print( (firstNum / secondnum) + “ “);**

**firstNum += 2;**

**secondnum = firstNum % 3;**

**}**

**System.out.println();**

1. Assuming

**char letter = ‘A’;**

**while ( letter <= ‘F’){**

**System.out.print( letter + “ “);**

**letter++;**

**}**

**System.out.println();**

1. **Assuming that the user inputs 2745**

**int sum = 0, digit;**

**Scanner in = new Scanner(System.in);**

**System.out.println(“Please input an integer > 0);**

**int num = in.nextInt();**

**while (num > 0){**

**digit = num % 5;**

**System.out.println( digit );**

**sum += digit;**

**num = num / 5;**

**}**

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

1. **What is the output of the following main program and methods. EXPLAIN WHY with a TRACE TABLE:**

**public static void main(String[] args){**

**int x, y;**

**x = 10;**

**System.out.println(secret(x));**

**x = 5;**

**y = 8;**

**System.out.println( another(x,y));**

**}// end main**

**public static int secret( int x ){**

**int i , j;**

**i = 2 \* x;**

**if (i > 10)**

**j = x / 2;**

**else**

**j = x / 3;**

**return j-1;**

**}// end secret**

**public static int another ( int a, int b){**

**int i, j;**

**j = 0;**

**for (i = a; i <= b; i++){**

**j = j + 1;**

**}**

**return j;**

**}// end another**

1. **Write a method or code snippet for each of the following problems**
   1. Rewrite the following as a **for** loop:

**int i=5, value = 0;**

**while( i<=20){**

**if ( i % 2 == 0 && i <= 10)**

**value = value + i \* i;**

**else if (i % 2 == 0 && i > 10)**

**value = value + i;**

**else**

**value = value - i;**

**}**

1. **Assuming:**

**String line = “ABCDEFGHIJKLMNOP”;**

**Write code to print the contents of “line” backwards. You must use a loop**

1. **During tax season, Vision Accounting, offers reduced assistance for low income individuals. Their normal hourly rate is $60.00/hour, charged at 20 minute intervals. Write a code snippet (or main program) that tells how much it would cost an individual to get help with their taxes:**

* if the individual is low income ( income <= 25000), assistance is free
* if the individual’s income is <= 50000,
  + if the session is <= 20 minutes it is still free
  + for > 20 minutes, for each 20 minutes it is 1/2 of the normal hourly rate
* for individuals making over 50000 the normal hourly rate is used, calculated at 20 minute intervals

**prompt the user for the individual’s income and the length of the appointment**

**Be sure to print out the persons income, length of the appointment and the cost**