**Problem Solving and Programming**

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**Assignment #1 Exercises**

1. **How does machine language differ from Java?**

Machine language differs from java in that it can be directly executed by the computer. Java has to compile the programs into language called bytecode.

1. **How does bytecode differ from machine language?**

Bytecode is generated from compiling a source code to be executed, and machine language is a set of instructions that can be executed.

1. **What would the following statements, when used in a Java program, display on the screen?**

int age;

age = 20;

System.out.println (“My age is”);

System.out.println(age);

The following statements would display “My age is 20” when used in a Java program.

1. **Write a statement or statements that can be used in a Java program to display the following on the screen: 3, 2, 1**

System.out.println(“3”);

System.out.println(“2”);

System.out.println(“1”);

1. **Write statements that can be used in a Java program to read your age, as entered at the keyboard, and display it on the screen.**

java.util.Scanner keyboard = new java.util.Scanner(System.in);

System.out.println(“Enter your age”);

Int age = input.nextInt();

System.out.println(“Your age is” + age);

1. **What attributes and behaviors would an object representing a credit card account have?**

**Attributes:** Type of card, card number, card holder name (First and Last), card holder’s address (Street, City, State and Zip), expiration date of card (Month and Year), card limit, and card balance.

**Behaviors:** Make payment, refund payment, and increase card limit.

1. **Suppose that you have a number x that is greater than 1. Write an algorithm that computes the largest integer k such that 2k is less than or equal to x.**

x is greater than 1

k = 0

while 2^k is less than or equal to x

{

add 1 to k

}

subtract 1 from k

1. **Write an algorithm that finds the maximum value in a list of values.**

maxValue = -1

iterate through each list value

{

if list value is greater than maxValue = list value

}

1. **Birthdate Project**

import java.util.\*;

import java.util.Calendar;

public class BirthdayWizard

{

public static void main(String[] args)

{

String name;

java.util.Scanner keyboard = new java.util.Scanner(System.in);

Calendar now = Calendar.getInstance();

//Asks user for the month they were born

System.out.println("Enter the month you were born");

int month = keyboard.nextInt();

//Asks user for the day they were born

System.out.println("Enter the day you were born");

int birthday = keyboard.nextInt();

//Asks user for their age

System.out.println("Enter your age");

int age = keyboard.nextInt();

//Tells user their age on certain year

System.out.println("You will turn " + (age + 1) + " on " + month + "-" + birthday + "-" + (now.get(Calendar.YEAR) + 1));

}

}

1. **Numbers Project**

import java.util.\*;

public class NumbersBetween

{

public static void main(String[] args)

{

String name;

java.util.Scanner keyboard = new java.util.Scanner(System.in);

//Asks user to enter small #

System.out.println("Enter first integer - SMALL NUMBER");

int firstInteger = keyboard.nextInt();

//Asks user to enter large #

System.out.println("Enter second integer - LARGE NUMBER");

int secondInteger = keyboard.nextInt();

//Outputs the #s between the smaller # and larger #

System.out.println("The numbers between " + firstInteger + " and " + secondInteger + " are");

for(int numbers = firstInteger; numbers <= secondInteger; numbers++)

{

System.out.println(numbers);

}

}

}