CSE 220 – Programming in C

Quiz #1

Spring 2016

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section:\_\_\_\_\_\_

1. What is the output of the following C programs? (24 pts)

Program A

#include <stdio.h>

int main() {

int x = 3;

int y = x << 1;

if (y > 5)

printf("You win");

else

printf("You lose");

return 0;

}

You win

Explanation:

x = 3, in binary: x = 11

Bitwise shift left one position: y = 110 which is 6 and is greater than 5

Program B

#include <stdio.h>

int main() {

int x = 5, y = 2;

y \*= x++; //A

float z = ++x + y++ - (x && y) ; //B

printf("%.2f, %d, %d", z, x, y); //C

return 0;

}

A: y = y \* 5 = 10 and x = x + 1 = 6;

B: z = (++x) + (y++) - (x && y)

x is incremented first, becomes 7

y is incremented after z is computed, becomes 11

z = 7 + 10 – (7 && 10) = 7 + 10 – 1 = 16

Output:

16.00, 7, 11

Program C

#include <stdio.h>

int main(){

float x;

int a = 4, b = 7;

x = a ? a + b : a - b;

printf("%.4f", x);

return 0;

}

a is non zero so x = a + b = 11

Output: 11.0000

Program D

#include <stdio.h>

int main() {

int i = -4;

while (i < 0) {

i++;

printf("%d\n", i);

}

return 0;

}

-3

-2

-1

0

1. Write a loop to print integers between 20 and 50 counting by 3. The output should be as follows: 20 23 26 29 … 47 50 (15pts):

int x;

for (x=20; x<=50; x += 3)

printf(“%d “, x);

1. Complete the program below so it outputs the middle value among variables value1, value2, and value3. (15 pts)

#include <stdio.h>

int main(){

float value1, value2, value3;

printf(“Enter three numbers:\n”);

scanf(“%f %f %f”, &value1, &value2, &value3);

if ((value2 < value1 && value1 < value3) ||

(value3 < value1 && value1 < value2))

printf(“The middle value is %d\n”, value1);

else if ((value1 < value2 && value2 < value3) ||

(value3 < value2 && value2 < value1))

printf(“The middle value is %d\n”, value2);

else

printf(“The middle value is %d\n”, value3);

return 0;

}

1. The following program asks the user to enter 20 integers and prints out the largest one. There are a number of errors in the program. Fix 5 of them. (25 pts)

#include<stdio.h>

int main(void ) {

int largest = -99999, number, tmpNumber;

printf(“Enter 20 numbers:\n”);

for (tmpNumber = 1; tmpNumber <= 20; tmpNumber++) {

scanf(“%d”, &number);

if (number > largest) {

largest = number;

}

~~total++;~~ //Not needed

}

printf(“The largest is: %d\n”, largest);

return 0;

}

1. Write a program that reads a sentence from the user. The sentence ends when the user types one of the following punctuations: **. ? !**

The program should output the percentage of vowels (a, e, i, o, u) from the input up to 3 decimal digits, always showing the sign. (30 pts)

#include <stdio.h>

int main(void) {

char letter;

int vowel\_count = 0, total\_count = 0;

printf(“Enter a sentence( .!? to end) \n””);

//start reading

do {

scanf(“%c”, &letter);

if (letter == ‘.’ || letter == ‘!’ || letter == ‘?’) {

break; //exit the loop when punctuation reached

} else if (letter == ‘a’ || letter == ‘e’ || letter == ‘i’

|| letter == ‘o’ || letter == ‘u’) {

vowel\_count++;

}

total\_count++;

} while (1);

float percentage = (float)vowel\_count / total\_count;

printf(“Percentage of vowels: %+.3f\n”, percentage);

return 0;

}