**

***SEMESTER ASSIGNMENT (SEPTEMBER -DECEMBER 2022/23)***

*SCHOOL OF COMPUTING AND INFORMATICS*

***DEPARTMENT OF INFORMATION SCIENCES***

***ADM NO****:* ***BSCIS/2021/83673***

***NAME: VINCENT KAMAU THUO***

**BIT2209-INTRODUCTION TO PROGRAMMING METHODOLOGY**

1. Discuss unions in C programming (2marks)

Unions in C programming are data structures that allow different data types to be stored in the same memory location. They are similar to structures in that they can contain multiple variables, but unlike structures, only one variable can be accessed at a time. Unions are defined using the "union" keyword

1. With an example discuss the following: (6marks)
   1. Do..while loop

The do..while loop is a control structure in C programming that executes a block of code repeatedly until a specified condition is met. Unlike the while loop, the do..while loop always executes at least once, even if the condition is false.

Example:

#include <stdio.h>

int main() {

int i = 0;

do {

printf("%d ", i);

i++;

} while (i < 5);

return 0;

}

* 1. Switch statement

The switch statement is a control structure in C programming that allows a variable to be tested for equality against a list of values. If the variable matches one of the values, the corresponding block of code is executed. If none of the values match, an optional default block of code is executed.

Example:

#include <stdio.h>

int main() {

int day = 4;

switch (day) {

case 1:

printf("Monday\n");

break;

case 2:

printf("Tuesday\n");

break;

case 3:

printf("Wednesday\n");

break;

case 4:

printf("Thursday\n");

break;

case 5:

printf("Friday\n");

break;

default:

printf("Weekend\n");

break;

}

return 0;

}

1. By using *math* function , write a program that returns the largest of three values (6marks)

Here's an example program in C that uses the fmax() function from the math library to find the largest of three values:

#include <stdio.h>

#include <math.h>

int main() {

int num1, num2, num3, max;

printf("Enter three numbers: ");

scanf("%d %d %d", &num1, &num2, &num3);

max = fmax(fmax(num1, num2), num3);

printf("The largest number is: %d", max);

return 0;

}

In this program, the fmax() function is used to find the largest of three numbers num1, num2, and num3. The scanf() function is used to read in the three numbers from the user. The printf() function is used to display the largest number on the screen.

Note that the fmax() function requires the math.h library to be included at the beginning of the program. The function takes two parameters and returns the maximum value of the two. In this program, the function is called multiple times to compare all three values and find the largest of them.

1. What are the functions of the following statements in a C program? Demonstrate how they are used in C (6marks)
   * 1. Break
   * break statement in C programming is used to exit from a loop, switch statement, or nested loop. Whenever a break statement is encountered, it causes the control to exit the loop and continue with the next statement after the loop. A break statement is most commonly used in the switch statement, where it is used to exit from the switch statement when a match is found. Here's an example program that demonstrates the use of break statement in a for loop:

#include <stdio.h>

int main() {

int i;

for (i = 1; i <= 10; i++) {

if (i == 5) {

break;

}

printf("%d ", i);

}

return 0;

}

* + 1. Continue

continue statement in C programming is used to skip the current iteration of a loop and move to the next iteration. Whenever a continue statement is encountered, it causes the control to skip the remaining statements in the current iteration and move on to the next iteration. A continue statement is most commonly used in for, while, and do-while loops. Here's an example program that demonstrates the use of continue statement in a for loop

#include <stdio.h>

int main() {

int i;

for (i = 1; i <= 10; i++) {

if (i % 2 == 0) {

continue;

}

printf("%d ", i);

}

return 0;

}

1. Write a C program to generate the following code(6marks)

1 2 3 4

1 2 3

1 2

1

Here's an example program in C that generates the pattern 1 2 3 4, 1 2 3, 1 2, 1:

#include <stdio.h>

int main() {

int i, j;

for (i = 4; i >= 1; i--) {

for (j = 1; j <= i; j++) {

printf("%d ", j);

}

printf("\n");

}

return 0;

}

In this program, the outer loop runs from 4 to 1, and the inner loop runs from 1 to the current value of the outer loop variable. The printf() function is used to print the numbers in each row, and a newline character is added at the end of each row to start the next row on a new line. As a result, the output of this program is:

1 2 3 4

1 2 3

1 2

1