

CENG198

LAB SOLUTIONS

Lab1, Part2:

```
#include <stdio.h>

int main()
{
    printf("Hello \nWorld! \nI \nam \nlearning \nC!\n");
}
```

Lab1, Part3:

```
#include <stdio.h>

int main()
{
    printf("Name: Michael\n");
    printf("Lastname: Kayne\n");
    printf("Address: Newyork");
    printf("Telephone: 008025389462\n");
    printf("Age: 34\n");

    return 0;
}
```

Lab2, Part2:

```
#include<stdio.h>

void main()
{
    int num1=0;
    int num2=0;
    int multiply;
    int sum=0;
    int difference=0;
    int remainder;

    float divide;
```

```
float avg;
```

```
printf("\n Enter two integers and I will tell you\n the relationship they satisfy: \n");  
scanf("%d%d", &num1, &num2);
```

```
if( num1 == num2 )  
{  
    printf("\n%d is equal to %d\n", num1, num2);  
    multiply = num1 * num2;  
    printf("The product of the numbers is: %d\n\n", multiply);  
}
```

```
if( num1 != num2 )  
{  
    printf("\n%d is not equal to %d\n", num1, num2);  
    divide = (float)num1/num2;  
    printf("The division of the numbers is: %f\n\n", divide);  
}
```

```
if( num1 > num2 )  
{  
    printf("%d is greater than %d\n", num1, num2);  
    difference = num1 - num2;  
    printf("The difference of the numbers is: %d\n\n", difference);  
}
```

```
if( num1 < num2 )  
{  
    printf("%d is less than %d\n", num1, num2);  
    sum = num1 + num2;  
    printf("The sum of the numbers is: %d\n\n", sum);  
}
```

```
if( num1 <= num2 )  
{  
    printf("%d is less than or equal to %d\n", num1, num2);  
    avg = (float)(num1 + num2)/2;  
    printf("The average of the numbers is: %f\n\n", avg);  
}
```

```

    if( num1 >= num2 )
    {
        printf("%d is greater than or equal to %d\n", num1, num2);
        remainder = num1%num2;
        printf("The remainder of %d divided by %d is: %d\n\n",num1, num2,
remainder);
    }
}

```

Lab3, Part2:

```
#include<stdio.h>
```

```
void main()
```

```

{
    int grade=0;
    int total=0;
    int counter=0;
    float average;

    while( grade != -1 )
    {
        printf("Enter a grade between 0-100 (Press -1 to terminate):");
        scanf("%d", &grade);

        if( grade<0 && grade != -1 )
            printf("Illegal grade entered!!!\n");

        if( grade > 0 && grade != -1 )
        {
            counter++;
            total = total + grade;
        }
    }

    average = (float)total/counter;

    printf("\nThe class average is: %f\n\n", average);
}

```

Lab3, Part3:

```
#include<stdio.h>
```

```
void main()
```

```
{
```

```
    float Total_Grade=0;
```

```
    int firstMidterm=0;
```

```
    int secondMidterm=0;
```

```
    int final=0;
```

```
    printf("Enter the grade of the first midterm: ");
```

```
    scanf("%d", &firstMidterm);
```

```
    printf("Enter the grade of the second midterm: ");
```

```
    scanf("%d", &secondMidterm);
```

```
    printf("Enter the grade of the final: ");
```

```
    scanf("%d", &final);
```

```
    Total_Grade = (float)(firstMidterm * 0.25) + (float)(secondMidterm * 0.25) + (float)
    (final * 0.5);
```

```
    printf("The total grade is: %f it's letter equivalent is: ", Total_Grade);
```

```
    if( Total_Grade <= 100 && Total_Grade >= 90 )
```

```
        printf("AA\n");
```

```
    else if( Total_Grade <= 89 && Total_Grade >= 85 )
```

```
        printf("BA\n");
```

```
    else if( Total_Grade <= 84 && Total_Grade >= 75 )
```

```
        printf("BB\n");
```

```
    else if( Total_Grade <= 74 && Total_Grade >= 70 )
```

```
        printf("CB\n");
```

```
    else if( Total_Grade <= 69 && Total_Grade >= 60 )
```

```
        printf("CC\n");
```

```
    else if( Total_Grade <= 59 && Total_Grade >= 55 )
```

```
        printf("DC\n");
```

```
    else if( Total_Grade <= 54 && Total_Grade >= 45 )
```

```
        printf("DD\n");
```

```
    else if( Total_Grade <= 44 && Total_Grade >= 25 )
```

```
        printf("FD\n");
```

```
    else if( Total_Grade <= 24 && Total_Grade >= 0 )
```

```
        printf("FF\n");
    }
```

Lab5, Part2:

```
#include <stdio.h>
```

```
void printLetter(char, int, int);
```

```
int main()
```

```
{
    char ch;
    int row, column;

    printf("Enter character to print: ");
    scanf("%c", &ch);
    fflush(stdin);
    printf("Enter how many times you want to print that char on a line: ");
    scanf("%d", &row);
    printf("Enter how many lines you want to print that char: ");
    scanf("%d", &column);

    printLetter(ch, row, column);

    return 0;
}
```

```
void printLetter(char c, int r, int cl)
```

```
{
    int i, j;

    for (i = 0; i < r; i++)
    {
        for (j = 0; j < cl; j++)
            printf("%c", c);
        printf("\n");
    }
}
```

Lab6, Part2:

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include <math.h>

#define SIZE 100

int main()
{
    srand(time(0));
    int array[SIZE];
    int i;

    double average, sum;
    double stdDev;

    for (i = 0; i < SIZE; i++)
        array[i] = rand()%1000;

    sum = 0;
    // calculate average
    for (i = 0; i < SIZE; i++)
        sum += array[i];
    average = sum / SIZE;

    sum = 0;
    // calculate standard deviation
    for (i = 0; i < SIZE; i++)
        sum += pow((array[i] - average), 2);
    stdDev = sqrt(sum/SIZE);

    printf("Average: %lf\n", average);
    printf("Standard Deviation: %lf\n", stdDev);

    return 0;
}

```

Grading Lab1:

```

#include <stdio.h>

```

```

void main()
{
    int side_number;
    float perimeter, area;

    printf("\nEnter the number of sides (0 for circle, 3 for triangle, 4 for rectangle): ");
    scanf("%d", &side_number);

    if(side_number == 0)
    {
        int radius;
        printf("\nEnter the radius of the circle: ");
        scanf("%d", &radius);

        perimeter = 2*(3.14)*radius;
        area = (3.14)*radius*radius;

        printf("\nThe perimeter of the circle with radius %d is %f\n\n", radius,
perimeter);
        printf("The area of the circle with radius %d is %f\n\n", radius, area);
    }
    else if(side_number == 3)
    {
        int side1, side2, side3;
        printf("\nEnter the three sides of the triangle: ");
        scanf("%d%d%d", &side1, &side2, &side3);

        perimeter = side1 + side2 + side3;

        printf("\nThe perimeter of the triangle with sides %d, %d, and %d is %f\n\n",
side1, side2, side3, perimeter);
    }
    else if(side_number == 4)
    {
        int side1, side2;
        printf("\nEnter the two sides of the rectangle: ");
        scanf("%d%d", &side1, &side2);

        perimeter = 2 * (side1 + side2);
        area = side1 * side2;
    }
}

```

```

        printf("\nThe perimeter of the rectangle with sides %d and %d is %f\n\n",
side1, side2, perimeter);
        printf("The area of the rectangle with sides %d and %d is %f\n\n", side1, side2,
area);
    }
}

```

Grading Lab2:

Section 1, 2:

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>

int main()
{
    srand(time(0));
    int randNum, guess, winCount;

    randNum = rand()%100;

    winCount = 0;

    printf("I have a number, try to guess it: ");
    scanf("%d", &guess);

    while (guess != randNum)
    {
        if(guess > randNum)
            printf("Too high, a little bit lower please: ");
        else if(guess < randNum)
            printf("Too low, a little bit higher please: ");
        scanf("%d", &guess);
        winCount ++;
    }

    printf("You found the number! Congratulations!\n");
    printf("Number of tries: %d\n", winCount);

    return 0;
}

```



```
}
```

Section 3, 4:

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    int sales;
```

```
    double salary;
```

```
    printf("Enter sales in dollars (-1 to end): ");
```

```
    scanf("%d", &sales);
```

```
    while (sales != -1)
```

```
    {
```

```
        if(sales >= 2500)
```

```
            salary = 200 + sales * 0.12;
```

```
        else if(sales < 2500)
```

```
            salary = 200 + sales * 0.08;
```

```
        printf("Salary is: %lf\n", salary);
```

```
        printf("Enter sales in dollars (-1 to end): ");
```

```
        scanf("%d", &sales);
```

```
    }
```

```
    return 0;
```

```
}
```

Grading Lab3:

Section 1, 2:

```
#include <stdio.h>
```

```
double simpleCalculator(double, char, double);
```

```
int main()
```

```
{
```

```
    double firstOp, secondOp;
```

```
    char oper;
```

```

double result;

printf("Enter first operand: ");
scanf("%lf", &firstOp);
fflush(stdin);
printf("Enter operator (+, -, *, or /): ");
scanf("%c", &oper);
fflush(stdin);
printf("Enter second operand: ");
scanf("%lf", &secondOp);

result = simpleCalculator(firstOp, oper, secondOp);

printf("Result of the operation %lf %c %lf is %lf\n", firstOp, oper, secondOp, result);

return 0;
}

double simpleCalculator(double fo, char op, double so)
{
    if(op == '+')
        return fo + so;
    else if(op == '-')
        return fo - so;
    else if(op == '*')
        return fo * so;
    return fo / so;
}

```

Grading Lab4:

```

#include <stdio.h>
#include <stdlib.h>
#include <time.h>

#define SIZE 100

void generateRandom(int arr[], int s);
void findMinMaxandIndexes(int arr[], int s);

int main()

```

```

{
    srand(time(0));
    int array[SIZE];

    generateRandom(array, SIZE);
    findMinMaxandIndexes(array, SIZE);

    return 0;
}

void generateRandom(int arr[], int s)
{
    for (int i = 0; i < s; i++)
        arr[i] = rand()%1000;
}

void findMinMaxandIndexes(int arr[], int s)
{
    int min, max, minIndex, maxIndex;

    min = arr[0];
    max = arr[0];

    for (int i = 1; i < s; i++)
    {
        if (arr[i] > max)
        {
            max = arr[i];
            maxIndex = i;
        }
        else if(arr[i] < min)
        {
            min = arr[i];
            minIndex = i;
        }
    }

    printf("Max. Number: %d, Index of Max. Number: %d\n", max, maxIndex);
    printf("Min. Number: %d, Index of Min. Number: %d\n", min, minIndex);
}

```