

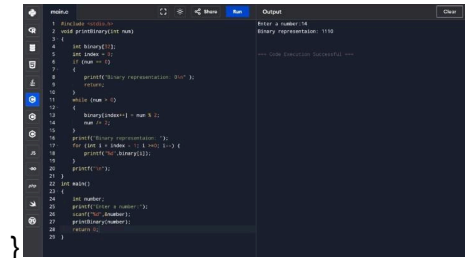
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LAB ASSIGNMENT-1

1. Write a program to print the binary representation of a number using loops.

Example: Input = 5, Output = 101.

```
#include <stdio.h>
int main() {
    int num, binary[32], i = 0;
    printf("Enter a number: ");
    scanf("%d", &num);
    while (num > 0) {
        binary[i] = num % 2;
        num /= 2;
        i++;
    }
    printf("Binary: ");
    for (int j = i - 1; j >= 0; j--) {
        printf("%d", binary[j]);
    }
    return 0;
}
```



2. Write a program to count the number of vowels and consonants in a string using pointers.

```
#include <stdio.h>
int main() {
    char str[100];
    int vowels = 0, consonants = 0;
    printf("Enter a string: ");
    scanf("%s", str);
    for (char *ptr = str; *ptr != '\0'; ptr++) {
        char ch = *ptr;
        if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
            ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U') {
            vowels++;
        } else if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
            consonants++;
        }
    }
}
```

```

}
}
printf("Vowels: %d, Consonants: %d\n", vowels, consonants);
return 0;
}

```

```

1 //countChars.cpp
2 #include <iostream>
3 using namespace std;
4
5 char ch = 'a';
6 if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u')
7 {
8     //vowel
9     //countVowels++;
10 }
11 else
12 {
13     //consonant
14     //countConsonants++;
15 }
16 }
17
18 int main()
19 {
20     string str = "hello world";
21     int vowels = 0;
22     int consonants = 0;
23     countChars(str, vowels, consonants);
24     cout << "Vowels: " << vowels << endl;
25     cout << "Consonants: " << consonants << endl;
26     return 0;
27 }

```

3. Write separate functions for addition, subtraction, multiplication, and division. Call these functions from a menu-driven program.

```

#include <stdio.h>
int add(int a, int b) { return a + b; }
int subtract(int a, int b) { return a - b; }
int multiply(int a, int b) { return a * b; }
float divide(int a, int b) { return (float)a / b; }
int main() {
    int a, b, choice;
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);
    printf("1. Add\n2. Subtract\n3. Multiply\n4. Divide\nEnter choice: ");
    scanf("%d", &choice);
    switch (choice) {
        case 1: printf("Result: %d\n", add(a, b)); break;
        case 2: printf("Result: %d\n", subtract(a, b)); break;
        case 3: printf("Result: %d\n", multiply(a, b)); break;
        case 4: printf("Result: %.2f\n", divide(a, b)); break;
        default: printf("Invalid choice!\n");
    }
    return 0;
}

```

```

1 //arithmetics.cpp
2 #include <iostream>
3 using namespace std;
4
5 int add(int a, int b) { return a + b; }
6 int subtract(int a, int b) { return a - b; }
7 int multiply(int a, int b) { return a * b; }
8 float divide(int a, int b) { return (float)a / b; }
9
10 int main()
11 {
12     int a, b, choice;
13     float result;
14     cout << "Enter two numbers: ";
15     cin >> a >> b;
16     cout << endl;
17     cout << "1. Add\n2. Subtract\n3. Multiply\n4. Divide\nEnter choice: ";
18     cin >> choice;
19     switch (choice)
20     {
21         case 1: result = add(a, b); break;
22         case 2: result = subtract(a, b); break;
23         case 3: result = multiply(a, b); break;
24         case 4: result = divide(a, b); break;
25         default: cout << "Invalid choice!\n";
26     }
27     cout << "Result: " << result << endl;
28     return 0;
29 }

```

```

1 float sub(float a, float b);
2 float sub(float a, float b);
3 float mult(float a, float b);
4 float div(float a, float b);
5 float dec(float a, float b);
6 int main()
7 {
8     float num1, num2, result;
9     int choice;
10    printf("Enter your choice (1-5): ");
11    scanf("%d", &choice);
12    if (choice == 1 || choice == 2 || choice == 3 || choice == 4 || choice == 5)
13    {
14        printf("Enter two numbers: ");
15        scanf("%f %f", &num1, &num2);
16        switch (choice)
17        {
18            case 1:
19                result = add(num1, num2);
20                printf("Result: %.2f\n", result);
21                break;
22            case 2:
23                result = sub(num1, num2);
24                printf("Result: %.2f\n", result);
25                break;
26            case 3:
27                result = mult(num1, num2);
28                printf("Result: %.2f\n", result);
29                break;
30            case 4:
31                result = div(num1, num2);
32                printf("Result: %.2f\n", result);
33                break;
34            case 5:
35                result = dec(num1, num2);
36                printf("Result: %.2f\n", result);
37                break;
38        }
39    }
40    else
41    {
42        printf("Invalid choice. Please try again.\n");
43    }
44    return 0;
45 }

```

4. Write a program to print a diamond-shaped pattern using loops.

Ex: Input: n = 5

Output:

```

*
***
*****
*****
*****
*****
*****
*****
*****
*****

```

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

```
int main() {
```

```
int n;
```

```
printf("Enter the value of n: ");
```

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

```
for (int i = 1; i <= n; i++) {
```

```
for (int j = i; j < n; j++) printf(" ");
```

```
for (int j = 1; j <= 2 * i - 1; j++) printf("*");
```

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

```
}
```

```
for (int i = n - 1; i >= 1; i--) {
```

```
for (int j = n; j > i; j--) printf(" ");
```

```
for (int j = 1; j <= 2 * i - 1; j++) printf("*");
```

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

```
}
```

```
return 0;
```

```
}
```

```

1 #include <stdio.h>
2
3 int main() {
4     int n;
5     printf("Enter the value of n: ");
6     scanf("%d", &n);
7
8     for (int i = 1; i <= n; i++) {
9         for (int j = 1; j <= n; j++) {
10             printf("%d ", i*j);
11         }
12         printf("\n");
13     }
14
15     for (int i = 1; i <= n; i++) {
16         for (int j = 1; j <= n; j++) {
17             printf("%d ", i*j);
18         }
19     }
20
21     return 0;
22 }

```

5. Write a program to find the length of a given string using pointers.

Ex : Input: "Hello"

Output: 5

#include <stdio.h>

int main() {

char str[100];

printf("Enter a string: ");

scanf("%s", str);

int length = 0;

for (char *ptr = str; *ptr != '\0'; ptr++) {
length++;

}

printf("Length: %d\n", length);

return 0;

}

```

1 #include <stdio.h>
2
3 int main() {
4     char str[100];
5     printf("Enter a string: ");
6     scanf("%s", str);
7
8     int length = 0;
9     for (char *ptr = str; *ptr != '\0'; ptr++) {
10         length++;
11     }
12     printf("Length: %d\n", length);
13     return 0;
14 }

```

6. Write a function to calculate the GCD (Greatest Common Divisor) of two numbers using recursion.

Ex: Input: a = 56, b = 98

Output: GCD is 14. #include <stdio.h> int gcd(int a, int b) { if (b == 0) return a; return gcd(b, a % b); } int main() { int a, b; printf("Enter two numbers: ");

scanf("%d %d", &a, &b);

printf("GCD: %d\n", gcd(a, b));

return 0; }

The screenshot shows the PyCharm IDE interface. The left sidebar contains icons for Explorer, Run and Debug, and Tools. The main editor area is split into two panes. The left pane displays a Python script named `main.py` with the following code:

```

1 # include random module
2 import random as rnd
3 # set seed to 13
4 random.seed(13)
5
6 return grade, n_h_hj)
7
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100

```

The right pane shows the output of the script, which is:

```

Enter line numbers: 14
22
1000 7

```

Below the output, there is a status bar that reads "Run: Execution Successful (0s)".