Unit-2

C programs

**C PROGRAM**

1. **2 STAGE PIPELINING**

#include <stdio.h>

int main() {

int a, b, choice, res;

int fetchCycles = 1;

int executeCycles = 1;

// Fetch Stage

printf("Enter number 1:");

scanf("%d", &a);

printf("Enter number 2:");

scanf("%d", &b);

// Execution Stage

printf("1-Addition:\n2-Subtraction:\n3-Multiplication:\n4-Division:");

scanf("%d", &choice);

switch (choice) {

case 1:

printf("Performing addition\n");

res = a + b;

break;

case 2:

printf("Performing subtraction\n");

res = a - b;

break;

case 3:

printf("Performing Multiplication\n");

res = a \* b;

break;

case 4:

printf("Performing Division\n");

res = a / b;

break;

default:

printf("Wrong input");

return 1;

}

printf("Result: %d\n", res);

printf("Total Cycles: %d\n", fetchCycles + executeCycles);

return 0;

}

1. **4 STAGE PIPELINING**

#include <stdio.h>

int main() {

int a, b, choice, res;

int fetchCycles = 1;

int decodeCycles = 1;

int executeCycles = 1;

int writeBackCycles = 1;

// Fetch Stage

printf("Enter number 1:");

scanf("%d", &a);

printf("Enter number 2:");

scanf("%d", &b);

// Decode Stage

printf("1-Addition:\n2-Subtraction:\n3-Multiplication:\n4-Division:");

scanf("%d", &choice);

// Execution Stage

switch (choice) {

case 1:

printf("Performing addition\n");

res = a + b;

break;

case 2:

printf("Performing subtraction\n");

res = a - b;

break;

case 3:

printf("Performing Multiplication\n");

res = a \* b;

break;

case 4:

printf("Performing Division\n");

res = a / b;

break;

default:

printf("Wrong input");

return 1;

}

// Write Back Stage

printf("Result: %d\n", res);

printf("Total Cycles: %d\n", fetchCycles + decodeCycles + executeCycles + writeBackCycles);

return 0;

}

1. **CPU PERFORMANCE**

#include <stdio.h>

int main()

{

float cr;

int p,p1,i;

float cpu[5];

float cpi,ct,max;

int n=1000;

for(i=0;i<=4;i++)

{

cpu[5]=0;

}

printf("\n Enter the number of processors:");

scanf("%d",&p);

p1=p;

for(i=0;i<p;i++)

{

printf("\n Enter the Cycles per Instrcution of processor:");

scanf("%f",&cpi);

printf("\n Enter the clockrate in GHz:");

scanf("%f",&cr);

ct=1000\*cpi/cr;

printf("The CPU time is: %f",ct);

cpu[i]=ct;

}

max=cpu[0];

for(i=0;i<p1;i++)

{

if(cpu[i]<=max)

max=cpu[i];

}

printf("\n The processor has lowest Execution time is: %f ", max);

return 0;

}

1. **FLOATING POINT ADDITION**

#include <stdio.h>

int main() {

// Declare variables

float num1, num2, sum;

// Get input from the user

printf("Enter the first number: ");

scanf("%f", &num1);

printf("Enter the second number: ");

scanf("%f", &num2);

// Perform addition

sum = num1 + num2;

// Display the result

printf("The sum of %f and %f is %f\n", num1, num2, sum);

return 0;

}

1. **FLOATING POINT SUBTRACTION**

#include <stdio.h>

int main() {

// Declare variables

float num1, num2, sub;

// Get input from the user

printf("Enter the first number: ");

scanf("%f", &num1);

printf("Enter the second number: ");

scanf("%f", &num2);

// Perform addition

sub = num1 - num2;

// Display the result

printf("The sub of %f and %f is %f\n", num1, num2, sub);

return 0;

}

1. **FLOATING POINT MULTIPLICATION**

#include <stdio.h>

int main() {

// Declare variables

float num1, num2, mul;

// Get input from the user

printf("Enter the first number: ");

scanf("%f", &num1);

printf("Enter the second number: ");

scanf("%f", &num2);

// Perform addition

mul = num1 \* num2;

// Display the result

printf("The mul of %f and %f is %f\n", num1, num2, mul);

return 0;

}

1. **FLOATING POINT DIVISION**

#include <stdio.h>

int main() {

// Declare variables

float num1, num2, div;

// Get input from the user

printf("Enter the first number: ");

scanf("%f", &num1);

printf("Enter the second number: ");

scanf("%f", &num2);

div = num1 / num2;

// Display the result

printf("The div of %f and %f is %f\n", num1, num2, div);

return 0;

}

1. **INTEGER ARI THEMATIC**

#include <stdio.h>

int main() {

int num1, num2;

// Input two integers

printf("Enter first integer: ");

scanf("%d", &num1);

printf("Enter second integer: ");

scanf("%d", &num2);

// Perform arithmetic operations

int sum = num1 + num2;

int difference = num1 - num2;

int product = num1 \* num2;

// Check if the second number is not zero before performing division

int quotient;

if (num2 != 0) {

quotient = num1 / num2;

} else {

printf("Cannot divide by zero.\n");

return 1; // Exit with an error code

}

// Print results

printf("Sum: %d\n", sum);

printf("Difference: %d\n", difference);

printf("Product: %d\n", product);

printf("Quotient: %d\n", quotient);

return 0; // Exit successfully

}

1. **SINGLE PRECISION REPRESENTATION**

#include <stdio.h>

int main() {

float num1 = 3.14159f; // Declare a single-precision variable

float num2 = 2.71828f;

float result;

result = num1 \* num2; // Perform a calculation

printf("Single-precision representation of num1: %.7f\n", num1);

printf("Single-precision representation of num2: %.7f\n", num2);

printf("Result of multiplication (single-precision): %.7f\n", result);

return 0;

}

1. **DOUBLE PRECISION REPRESENTATION**

#include <stdio.h>

int main() {

double num1 = 3.14159265358979323846; // Declare double-precision variables

double num2 = 2.71828182845904523536;

double result;

result = num1 \* num2; // Perform a calculation

printf("Double-precision representation of num1: %.16f\n", num1);

printf("Double-precision representation of num2: %.16f\n", num2);

printf("Result of multiplication (double-precision): %.16f\n", result);

return 0;

}

1. **CONVERT OCTAL TO DECIMAL, HEXADECIMAL, BINARY**

#include <stdio.h>

int main()

{

char octalnum[100];

long i = 0;

printf("Enter any octal number: ");

scanf("%s", octalnum);

printf("Equivalent binary value: ");

while (octalnum[i])

{

switch (octalnum[i])

{

case '0':

printf("000"); break;

case '1':

printf("001"); break;

case '2':

printf("010"); break;

case '3':

printf("011"); break;

case '4':

printf("100"); break;

case '5':

printf("101"); break;

case '6':

printf("110"); break;

case '7':

printf("111"); break;

default:

printf("\n Invalid octal digit ");

return 0;

}

i++;

}

return 0;

}

#include <stdio.h>

int main() {

int octal,hexa;

printf("Enter the octal value : ");

scanf("%o",&octal);

printf("The hexadecial of given octal number is : %x",octal);

}

#include <stdio.h>

int main() {

int octal;

printf("Enter the octal value : ");

scanf("%o",&octal);

printf("The decimal of given number is : %d",octal);

1. **CONVERT DECIMAL TO BINARY, OCTAL, HEXADECIMAL**

#include<stdio.h>

int main()

{

int n;

printf("enter the decimal number");

scanf("%d",&n);

printf("the hexa decimal value is:%x",n);

return 0;

}

#include<stdio.h>

int main()

{

int a[10],n,i;

printf("Enter the number to convert: ");

scanf("%d",&n);

for(i=0;n>0;i++)

{

a[i]=n%8;

n=n/8;

}

printf("\nOctal of Given Number is=");

for(i=i-1;i>=0;i--)

{

printf("%d",a[i]);

}

return 0;

}

#include<stdio.h>

int main()

{

int a[10],n,i;

printf("Enter the number to convert: ");

scanf("%d",&n);

for(i=0;n>0;i++)

{

a[i]=n%2;

n=n/2;

}

printf("\nBinary of Given Number is=");

for(i=i-1;i>=0;i--)

{

printf("%d",a[i]);

}

return 0;

}

1. **CONVERT HEXADECIMAL TO BINARY, OCTAL, DECIMAL**

#include<stdio.h>

int main()

{

int n;

printf("enter the hex decimal number");

scanf("%x",&n);

printf("the decimal value is:%d",n);

return 0;

}

#include <stdio.h>

int main() {

int n, a[10], m, i;

printf("Enter the hexadecimal number: ");

scanf("%x", &n);

m = n; // Save the decimal value in variable m

printf("Decimal value: %d\n", m);

for (i = 0; m > 0; i++) {

a[i] = m % 2;

m = m / 2;

}

printf("Binary of Given Number is: ");

for (i = i - 1; i >= 0; i--) {

printf("%d", a[i]);

}

return 0;

}

#include <stdio.h>

int main() {

int n, a[10], m, i;

printf("Enter the hexadecimal number: ");

scanf("%x", &n);

m = n; // Save the decimal value in variable m

printf("Decimal value: %d\n", m);

for (i = 0; m > 0; i++) {

a[i] = m % 8;

m = m / 8;

}

printf("Octal of Given Number is: ");

for (i = i - 1; i >= 0; i--) {

printf("%d", a[i]);

}

return 0;

}

#include <stdio.h>

int main() {

int n, a[10], m, i;

printf("Enter the hexadecimal number: ");

scanf("%x", &n);

m = n; // Save the decimal value in variable m

printf("Decimal value: %d\n", m);

for (i = 0; m > 0; i++) {

a[i] = m % 2;

m = m / 2;

}

printf("binary of Given Number is: ");

for (i = i - 1; i >= 0; i--) {

printf("%d", a[i]);

}

return 0;

}