LAB 12

ABHINAV ANAND ROLL-22052611 SEC-B16

```
//q1)Print the reverse of a positive integer.
#include <stdio.h>
int reverse(int n)
{
   int s=0;
   while (n>0)
   {
      s=s*10+(n%10);
      n/=10;
   }
   return s;
}
void main()
{
   int n;
   printf("Enter The Number");
   scanf("%d",&n);
   int rev =reverse(n);
   printf("Reverse of The Number: %d",rev);
}
```

Output-

```
Enter The Number14532
Reverse of The Number: 23541
```

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```
//q2)Check a positive integer is palindrome or not.
#include <stdio.h>
int palidrom(int n)
{
   int s=0, n1=n;
   while (n>0)
   {
      s=s*10+(n%10);
      n/=10;
   }
   if(n1=s)
   return 0;
   return 1;
}
void main()
{
   int n;
   printf("Enter The Number:");
   scanf("%d",&n);
   if(n<0)
   printf("Negative Integer, Palindrom Not Possible");
   else
   {
      printf("Positive Integer");
      int pali=palidrom(n);
      if(pali==0)
      printf("\t Number is Palindrome");
      else
      printf("\t Number is not Palindrome");
   }
}
```

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Output-

Enter The Number:1234321

Positive Integer Number is Palindrome

```
//q3) Find the LCM and HCF of two numbers
#include <stdio.h>
void hcflcm(int num1,int num2)
{
   int a,b,temp,hcf,lcm;
   a = num1;
   b = num2;
   while (b != 0)
   {
      temp = b;
      b = a % b;
      a = temp;
   }
   hcf = a;
   lcm = (num1 * num2) / hcf;
   printf("LCM OF THE NUMBER: %d \n HCF OF THE NUMBER: %d",lcm,hcf);
}
void main()
{
   int a,b;
   printf("Enter The Number 1: ");
   scanf("%d", &a);
   printf("Enter The Number 2: ");
   scanf("%d", &b);
   hcflcm(a,b);
}
```

Output-

Enter The Number 1: 6

Enter The Number 2: 92

LCM OF THE NUMBER: 276

HCF OF THE NUMBER: 2

//q4) Find out the prime factors of a number.

```
#include <stdio.h>
void primefactor(int n)
{
   int i = 2;
   while (i <= n)
   {
      if (n % i == 0)
      {
         printf("%d, ", i);
         n /= i;
      }
      else
         i++;
   }
}
void main()
{
   int a, b;
   printf("Enter The Number: ");
   scanf("%d", &a);
   primefactor(a);
}
```

Output-

Enter The Number: 86

2, 43

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```
//q5)Generate fibonacci series.
#include <stdio.h>
int fibo(int n){
   if(n==0 || n==1)
      return 1;
   else
      return(fibo(n-1)+fibo(n-2));
}
void main(){
   int n;
   printf("Enter The Number 1: ");
   scanf("%d", &n);
   for(int i=0;i<n;i++){
      printf("%d ,",fibo(i));
   }
   printf("\n");
}
```

Output-

```
Enter The Number: 10
1 ,1 ,2 ,3 ,5 ,8 ,13 ,21 ,34 ,55
```

```
//q6)Find the power of a positive integer.
#include <stdio.h>
int power(int a,int r,int p){
   if(r>0){
   p*=a;
   power(a,r-1,p);
   }
   else
   return p;
```

```
}
void main(){
   int a,b;
   printf("Enter The Number: ");
   scanf("%d", &a);
   printf("Enter The Power: ");
   scanf("%d", &b);
   int p=power(a,b,1);
   printf("Resultant: %d",p);
}
```

Output-

```
Enter The Number: 6
Enter The Power: 2
Resultant: 36
```

```
//q7)Find the factorial of a number.
#include <stdio.h>
int fact(int n) {
   int fact=1;
   if(n==0)
      return 1;
   else
      for(int i=n;i>1;i--)
      fact*=i;
   return fact;
}
int main() {
   int num;
   printf("Enter a positive integer: ");
   scanf("%d", &num);
   printf("Factorial Of The Number: %d",fact(num));
   return 0;
}
```

Output-

```
Enter a positive integer: 5
Factorial Of The Number: 120
```

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H.W Questions

Q1)

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

int main() {
   double purchase_price, down_payment, annual_interest_rate, monthly_interest_rate, principal,
monthly_payment;
   int num_payments;

   printf("Enter the car's purchase price: ");
   scanf("%lf", &purchase_price);

   printf("Enter the down payment amount: ");
   scanf("%lf", &down_payment);

   principal = purchase_price - down_payment;

   printf("Enter the annual interest rate (as a decimal): ");
   scanf("%lf", &annual_interest_rate);

   monthly_interest_rate = annual_interest_rate / 12.0;

   printf("Enter the number of payments: ");
   scanf("%d", &num_payments);

   monthly_payment = principal * (monthly_interest_rate * pow(1 + monthly_interest_rate,
num_payments)) / (pow(1 + monthly_interest_rate, num_payments) - 1);

   printf("Amount borrowed: $%.2lf\n", principal);
   printf("Monthly payment: $%.2lf\n", monthly_payment);

   return 0;
}
```

Output-

```
Enter the car's purchase price: 10000
Enter the down payment amount: 200
Enter the annual interest rate (as a decimal): 6
Enter the number of payments: 12
Amount borrowed: $9800.00
Monthly payment: $4938.06
```

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Q2)

```
#include <stdio.h>

void display_instructions() {
   printf("This program calculates the total cost of a house after a five-year period.\n");
   printf("You will need to enter the initial cost of the house, the estimated annual fuel costs,\n");
   printf("and the annual tax rate for the house.\n\n");
}

float calculate_total_cost(float initial_cost, float fuel_cost, float tax_rate) {
   float total_cost = initial_cost;
   for (int i = 0; i < 5; i++) {
      total_cost += fuel_cost;
      total_cost += initial_cost * tax_rate;
   }
   return total_cost;
}

int main() {
   float initial_costs[] = {67000.0, 62000.0, 75000.0};
   float fuel_costs[] = {2300.0, 2500.0, 2000.0};
   float tax_rates[] = {0.025, 0.025, 0.02};

   display_instructions();

   for (int i = 0; i < 3; i++) {
      float total_cost = calculate_total_cost(initial_costs[i], fuel_costs[i] * 5, tax_rates[i] * 5);
      printf("Total cost for house %d after 5 years: %.2f\n", i + 1, total_cost);
   }

   return 0;
}
```

Output-

```
This program calculates the total cost of a house after a five-year period.
You will need to enter the initial cost of the house, the estimated annual fuel costs,
and the annual tax rate for the house.

Total cost for house 1 after 5 years: 166375.00
Total cost for house 2 after 5 years: 163250.00
Total cost for house 3 after 5 years: 162500.00
```

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Q3)

```
#include <stdio.h>

float compute_acceleration(float t, float vi, float vf) {
   float a = (vf - vi) / (t * 60.0);
   return a;
}

int main() {
   float t = 1.0; // time interval of 1 minute
   float vi = 10.0; // initial velocity of 10 mi/hr
   float vf = 2.5; // final velocity of 2.5 mi/hr
   float a = compute_acceleration(t, vi, vf);
   float time_to_stop = vi / a;
   printf("The cyclist's constant rate of acceleration is %.2f mi/hr^2\n", a);
   printf("It will take %.2f seconds to come to rest.\n", time_to_stop * 3600.0);
   return 0;
}
```

Output-

The cyclist's constant rate of acceleration is -0.13 mi/hr^2
It will take -288000.00 seconds to come to rest.

Q4)

```
#include <stdio.h>
float celsius_at_depth(float depth) {
   float celsius = 10 * depth + 20;
   return celsius;
}
float fahrenheit(float celsius) {
   float fahrenheit = 1.8 * celsius + 32;
   return fahrenheit;
}
int main() {
   float depth, celsius, fahr;
   printf("Enter the depth inside the earth (in kilometers): ");
   scanf("%f", &depth);
   celsius = celsius_at_depth(depth);
   fahr = fahrenheit(celsius);
   printf("At a depth of %.2f kilometers inside the earth,\n", depth);
   printf("the temperature is %.2f degrees Celsius\n", celsius);
   printf("and %.2f degrees Fahrenheit.\n", fahr);
   return 0;
}
```

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Output-

```
Enter the depth inside the earth (in kilometers): 1000
At a depth of 1000.00 kilometers inside the earth,
the temperature is 10020.00 degrees Celsius
and 18068.00 degrees Fahrenheit.
```

Q5)

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


float calculate_speed_of_sound(float temperature) {
   float a = 1086 * sqrt((5 * temperature + 297) / 247.0);
   return a;
}

int main() {
   float temperature;
   printf("This program calculates the speed of sound in air based on temperature T (in
Fahrenheit)\n");
   printf("Enter a temperature value T to calculate the speed of sound: ");
   scanf("%f", &temperature);
   float speed_of_sound = calculate_speed_of_sound(temperature);
   printf("The speed of sound in air at %.2f degrees Fahrenheit is %.2f ft./sec.\n", temperature,
speed_of_sound);
   return 0;
}
```

Output-

```
This program calculates the speed of sound in air based on temperature T (in Fahrenheit)
Enter a temperature value T to calculate the speed of sound: 48
The speed of sound in air at 48.00 degrees Fahrenheit is 1601.28 ft./sec.
```

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Q6)

```
#include <stdio.h>

float population(int year) {
   int t = year - 1990;
   float P = 52.966 + 2.184 * t;
   return P;
}

int main() {
   int year;
   printf("Enter a year after 1990> ");
   scanf("%d", &year);
   float predicted_population = population(year);
   printf("Predicted Gotham City population for %d (in thousands): %.3f", year,
predicted_population);
   return 0;
}
```

Output-

```
Enter a year after 1990> 2023
Predicted Gotham City population for 2023 (in thousands): 125.038
```