**Question Number 1:**

**PROGRAM:**

#include <iostream>

using namespace std;

struct Vending\_Machine

{

string drink\_name;

int drink\_cost;

int number\_of\_drinks;

};

int main()

{

int Total=0,money=0, opt=0;

Vending\_Machine \*obj;

obj = new Vending\_Machine[4];

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

{

obj[i].number\_of\_drinks = 20;

}

while (opt != 5)

{

cout << "\t!! Welcome to the Vending Machine !!" << endl;

cout << endl << "\tDrink Name\tDrink Cost\tNumber of Drinks";

cout << endl << "\tCoca Cola \t75 \t" << obj[0].number\_of\_drinks;

cout << endl << "\tRoot Beer \t75 \t" << obj[1].number\_of\_drinks;

cout << endl << "\tGrape Soda\t80 \t" << obj[2].number\_of\_drinks;

cout << endl << "\tCream Soda\t80 \t" << obj[3].number\_of\_drinks;

cout << endl << "Enter your choice 1-4 to choose the drink or press 5 to exit ";

cout << endl << "Option Choosed : ";

cin >> opt;

switch (opt)

{

case 1:

obj[0].drink\_cost = 75;

cout << endl << "You have choosed Coca Cola !" << endl;

cout << "Enter the amount to purchase Coca Cola : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[0].drink\_cost)

{

Total = Total + obj[0].drink\_cost;

--obj[0].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[0].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 2:

obj[1].drink\_cost = 75;

cout << endl << "You have choosed Root Beer !" << endl;

cout << "Enter the amount to purchase Root Beer : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[1].drink\_cost)

{

Total = Total + obj[1].drink\_cost;

--obj[1].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[1].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 3:

obj[2].drink\_cost = 80;

cout << endl << "You have choosed Grape Soda !" << endl;

cout << "Enter the amount to purchase Grape Soda : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[2].drink\_cost)

{

Total = Total + obj[2].drink\_cost;

--obj[2].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[2].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 4:

obj[3].drink\_cost = 80;

cout << endl << "You have choosed Cream Soda !" << endl;

cout << "Enter the amount to purchase Cream Soda : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[3].drink\_cost)

{

Total = Total + obj[3].drink\_cost;

--obj[3].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[3].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 5:

cout << "You have exited from the Vending Machine, Thanks for your presence !";

break;

default:

cout << "Wrong Entry !!!" << endl;

break;

}

cout << endl << endl << "Want to Try Again ? Than press 1 or if you want to Exit than press 5 to exit : ";

cin >> opt;

system("cls");

}

cout << "Total Money Earned by Vending MAchine is : " << Total;

delete[]obj;

obj = NULL;

cout << endl << endl;

system("pause");

}

**A screenshot of a computer screen

Description automatically generated**

**Question Number 2:**

**PROGRAM:**

**MAIN CPP CODE:**

#include <iostream>

#include "Vending\_Machine.h"

using namespace std;

int main()

{

int Total=0,money=0, opt=0;

Vending\_Machine \*obj;

obj = new Vending\_Machine[4];

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

{

obj[i].number\_of\_drinks = 20;

}

while (opt != 5)

{

cout << "\t!! Welcome to the Vending Machine !!" << endl;

cout << endl << "\tDrink Name\tDrink Cost\tNumber of Drinks";

cout << endl << "\tCoca Cola \t75 \t" << obj[0].number\_of\_drinks;

cout << endl << "\tRoot Beer \t75 \t" << obj[1].number\_of\_drinks;

cout << endl << "\tGrape Soda\t80 \t" << obj[2].number\_of\_drinks;

cout << endl << "\tCream Soda\t80 \t" << obj[3].number\_of\_drinks;

cout << endl << "Enter your choice 1-4 to choose the drink or press 5 to exit ";

cout << endl << "Option Choosed : ";

cin >> opt;

switch (opt)

{

case 1:

obj[0].drink\_cost = 75;

cout << endl << "You have choosed Coca Cola !" << endl;

cout << "Enter the amount to purchase Coca Cola : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[0].drink\_cost)

{

Total = Total + obj[0].drink\_cost;

--obj[0].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[0].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 2:

obj[1].drink\_cost = 75;

cout << endl << "You have choosed Root Beer !" << endl;

cout << "Enter the amount to purchase Root Beer : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[1].drink\_cost)

{

Total = Total + obj[1].drink\_cost;

--obj[1].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[1].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 3:

obj[2].drink\_cost = 80;

cout << endl << "You have choosed Grape Soda !" << endl;

cout << "Enter the amount to purchase Grape Soda : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[2].drink\_cost)

{

Total = Total + obj[2].drink\_cost;

--obj[2].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[2].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 4:

obj[3].drink\_cost = 80;

cout << endl << "You have choosed Cream Soda !" << endl;

cout << "Enter the amount to purchase Cream Soda : ";

cin >> money;

if (money > -1 && money <= 100)

{

if (money > obj[3].drink\_cost)

{

Total = Total + obj[3].drink\_cost;

--obj[3].number\_of\_drinks;

cout << "You can pick up your drink from below and your change is : " << money - obj[3].drink\_cost;

}

else

cout << "Sorry, But your Money is less than the required amount " << endl;

}

else

cout << "Entered amount should be between 0 to 100 " << endl;

break;

case 5:

cout << "You have exited from the Vending Machine, Thanks for your presence !";

break;

default:

cout << "Wrong Entry !!!" << endl;

break;

}

cout << endl << endl << "Want to Try Again ? Than press 1 or if you want to Exit than press 5 to exit : ";

cin >> opt;

system("cls");

}

cout << "Total Money Earned by Vending MAchine is : " << Total;

delete[]obj;

obj = NULL;

cout << endl << endl;

system("pause");

}

**Header File Code:**

#include <string>

using namespace std;

class Vending\_Machine

{

public:

Vending\_Machine();

string drink\_name;

int drink\_cost;

int number\_of\_drinks;

~Vending\_Machine();

};

**Another CPP CODE:**

#include <iostream>

#include "Vending\_Machine.h"

using namespace std;

Vending\_Machine::Vending\_Machine()

{

drink\_cost = 0, drink\_name = 'NULL', number\_of\_drinks = 0;

}

Vending\_Machine::~Vending\_Machine()

{

}

**A screenshot of a computer screen

Description automatically generated**

**Question Number 3:**

**PROGRAM:**

#include <iostream>

using namespace std;

class Point

{

public:

Point() :x(0), y(0),opt(0) //Constructor

{};

void getvalues()

{

cout << "Enter the Number of Dimensions you want to calcute\n(NOTE:Only 2,3,4 and 5 Dimesions can be Entered) : ";

cin >> opt;

if (opt >= 2 && opt <= 5)

{

for (int i = 0; i < opt; i++)

{

cout << "Emter the value for " << i + 1 << " Dimesion : ";

cin >> ptr[i];

}

cout << endl;

}

else

cout << endl << "Invalid Entry, You have to choose Dimesions from 2 to 5 only !!! " << endl;

};

void compute\_distance()

{

if (opt >= 2 && opt <= 5)

{

if (opt == 2)

{

cout << "Distance B/W Dimensions is : " << ptr[0] - ptr[1];

}

else if (opt == 3)

{

cout << "Distance B/W Dimensions is : " << ptr[0] - ptr[1] - ptr[2];

}

else if (opt == 4)

{

cout << "Distance B/W Dimensions is : " << ptr[0] - ptr[1] - ptr[2] - ptr[3];

}

else if (opt == 5)

{

cout << "Distance B/W Dimensions is : " << ptr[0] - ptr[1] - ptr[2] - ptr[3] - ptr[4];

}

else

cout << "INVALID ENTRIES !!! " << endl;

}

else

cout << "INVLAID ENTRIES !!! " << endl;

};

~Point() //Destructor

{

delete[]ptr;

ptr = NULL;

}

float \*ptr = new float[5];

float x, y,opt;

};

int main()

{

Point Obj;

Obj.getvalues();

cout << endl;

Obj.compute\_distance();

cout << endl << endl;

system("pause");

}

**A screenshot of a computer screen

Description automatically generated**

**Question Number 4:**

**PROGRAM:**

#include <iostream>

#include <cstdlib>

#include <ctime>

using namespace std;

class TIC\_TAC\_TOE

{

public:

void Board()

{

system("cls");

cout << endl;

cout << " :\t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_" << endl;

cout << " \t| | | |" << endl;

cout << " TIC\t| " << board[0][0] << " | " << board[0][1] << " | " << board[0][2] << " |" << endl;

cout << " \t|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|" << endl;

cout << " \t| | | |" << endl;

cout << " TAC\t| " << board[1][0] << " | " << board[1][1] << " | " << board[1][2] << " |" << endl;

cout << " \t|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|" << endl;

cout << " \t| | | |" << endl;

cout << " TOE\t| " << board[2][0] << " | " << board[2][1] << " | " << board[2][2] << " |" << endl;

cout << " :\t|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|" << endl;

}

void TossP()

{

int a;

srand(time(NULL));

a = rand() % 2;

a = a + 1;

cout << endl << "\tPlayer " << a << " Won The Toss " << endl;

system("pause");

PVP(a);

}

void TossM()

{

int a;

srand(time(NULL));

a = rand() % 2;

a = a + 1;

if (a == 1)

cout << endl << "\tPlayer 1 Has Won The Toss" << endl;

else

cout << endl << "\tMachine Has Won The Toss" << endl;

system("pause");

PVM(a);

}

void PVP(int player)

{

int choice, i = 1, a;

char sign;

do

{

Board();

player = (player % 2) ? 1 : 2;

cout << " Player " << player << " Enter Number From 1-9 : ";

cin >> choice;

sign = (player == 1) ? 'X' : 'O';

if (choice == 1 && board[0][0] == '1')

board[0][0] = sign;

else if (choice == 2 && board[0][1] == '2')

board[0][1] = sign;

else if (choice == 3 && board[0][2] == '3')

board[0][2] = sign;

else if (choice == 4 && board[1][0] == '4')

board[1][0] = sign;

else if (choice == 5 && board[1][1] == '5')

board[1][1] = sign;

else if (choice == 6 && board[1][2] == '6')

board[1][2] = sign;

else if (choice == 7 && board[2][0] == '7')

board[2][0] = sign;

else if (choice == 8 && board[2][1] == '8')

board[2][1] = sign;

else if (choice == 9 && board[2][2] == '9')

board[2][2] = sign;

else

cout << "Invalid Entry";

Board();

i = Win\_Con();

player++;

} while (i == -1);

if (player == 2)

cout << endl << " Congratulations Player 1, YOU WON !!! ";

else

cout << " Congratulations Player 2, YOU WON !!! ";

}

void PVM(int player)

{

int choice, i = 1, a;

char sign;

do

{

Board();

player = (player % 2) ? 1 : 2;

cout << " Player " << player << " Enter Number From 1-9 : ";

if (player == 2) {

srand(time(0));

choice = rand() % 9;

}

else if (player == 1) {

cin >> choice;

}

sign = (player == 1) ? 'X' : 'O';

if (choice == 1 && board[0][0] == '1')

board[0][0] = sign;

else if (choice == 2 && board[0][1] == '2')

board[0][1] = sign;

else if (choice == 3 && board[0][2] == '3')

board[0][2] = sign;

else if (choice == 4 && board[1][0] == '4')

board[1][0] = sign;

else if (choice == 5 && board[1][1] == '5')

board[1][1] = sign;

else if (choice == 6 && board[1][2] == '6')

board[1][2] = sign;

else if (choice == 7 && board[2][0] == '7')

board[2][0] = sign;

else if (choice == 8 && board[2][1] == '8')

board[2][1] = sign;

else if (choice == 9 && board[2][2] == '9')

board[2][2] = sign;

else

cout << "Invalid Entry";

Board();

i = Win\_Con();

player++;

} while (i == -1);

if (player == 2)

cout << endl << " Congratulations Player 1, YOU WON !!! ";

else

cout << " Losser Player 1, MACHINE HAS WON !!! ";

}

int Win\_Con()

{

if (board[0][0] == board[0][1] && board[0][1] == board[0][2])

return 1;

else if (board[1][0] == board[1][1] && board[1][1] == board[1][2])

return 1;

else if (board[2][0] == board[2][1] && board[2][1] == board[2][2])

return 1;

else if (board[0][0] == board[1][0] && board[1][0] == board[2][0])

return 1;

else if (board[0][1] == board[1][1] && board[1][1] == board[2][2])

return 1;

else if (board[0][2] == board[1][2] && board[1][2] == board[2][2])

return 1;

else if (board[0][0] == board[1][1] && board[1][1] == board[2][2])

return 1;

else if (board[0][2] == board[1][1] && board[1][1] == board[2][0])

return 1;

else if (board[0][0] != '1' && board[0][1] != '2' && board[0][2] != '3' && board[1][0] != '4' &&

board[1][1] != '5' && board[1][2] != '6' && board[2][0] != '7' && board[2][1] != '8' &&

board[2][2] != '9')

return 1;

else

return -1;

}

void Instructions()

{

int i;

system("cls");

cout << endl << endl;

cout << "\t!! Following Instructions Should Be In Mind While Playing The Game !!" << endl << endl;

cout << " \* Each Player will be given his/her own turn." << endl;

cout << " \* Player 1 will be alloted 'X' sign and Player 2/Machine will be alloted 'O' sign." << endl;

cout << " \* Each Player have to fill row, column or diagonal to win." << endl;

}

void Credits()

{

int i;

system("cls");

cout << endl << endl;

cout << "\t !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! \t" << endl;

cout << "\t | @@@ |" << endl;

cout << "\t | |" << endl;

cout << "\t |\* PHANTOM \*|" << endl;

cout << "\t |\*Game is Devolped by Abdullah\*|" << endl;

cout << "\t |\* FAST-NU-CFD Batch-19 SE(A) \*|" << endl;

cout << "\t | |" << endl;

cout << "\t | @@@ |" << endl;

cout << "\t !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! \t";

}

char board[3][3] = { { '1', '2', '3' },{ '4', '5', '6' },{ '7', '8', '9' } };

};

int main()

{

TIC\_TAC\_TOE obj;

system("cls");

int opt, i;

cout << endl << endl;

cout << "\t \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_" << endl << endl;

cout << "\t | \t Enter 1 to Play Player vs Player |" << endl;

cout << endl << "\t |\t Enter 2 to Play Player vs Machine |" << endl;

cout << endl << "\t |\t Enter 3 to Show The Instructions |" << endl;

cout << endl << "\t |\t Enter 4 to Play The Credits |" << endl;

cout << "\t \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_" << endl;

cout << endl << " Option Chosed : ";

cin >> opt;

switch (opt)

{

case 1:

{

obj.Board();

obj.TossP();

cout << endl;

cout << endl << endl << "If you want to go back to Main Menu, Press 1 : ";

cin >> i;

if (i == 1)

main();

break;

}

case 2:

{

obj.Board();

obj.TossM();

cout << endl;

cout << endl << endl << "If you want to go back to Main Menu, Press 1 : ";

cin >> i;

if (i == 1)

main();

} break;

case 3:

{

obj.Instructions();

cout << endl;

cout << endl << endl << "If you want to go back to Main Menu, Press 1 : ";

cin >> i;

if (i == 1)

main();

break;

}

case 4:

{

obj.Credits();

cout << endl;

cout << endl << endl << "If you want to go back to Main Menu, Press 1 : ";

cin >> i;

if (i == 1)

main();

break;

}

default:

cout << "WRONG ENTRY,TRY AGAIN";

cout << endl << endl << "If you want to go back to Main Menu, Press 1 : ";

cin >> i;

if (i == 1)

main();

}

cout << endl << endl;

system("pause");

}

**A screenshot of a computer screen

Description automatically generated**

**A screenshot of a computer screen

Description automatically generated**

**Question Number 6:**

**PROGRAM:**

Understanding of this question is to much headache..

Due to lack of understanding, this question cannot be done by me!!!!

SORRY FOR THIS !

**Question Number 7:**

**PROGRAM:**

#include <iostream>

using namespace std;

int Palindrome(const string &, int, int);

int main()

{

char ptr[50];

cout << "Enter the String to check whether it is Palindrome or Not : ";

cin >> ptr;

if (Palindrome(ptr, 0, strlen(ptr) - 1))

cout << endl << "The given String is a Palindrome : " << ptr << endl;

else

cout << endl << "The given String is not a Palindrome : " << ptr << endl;

cout << endl << endl;

system("pause");

}

int Palindrome(const string &ptr, int a, int b)

{

if (a >= b)

return 1;

if(ptr[a] != ptr[b])

return 0;

return Palindrome(ptr, ++a, --b);

}

**A screenshot of a computer screen

Description automatically generated**

**Question Number 8:**

**PROGRAM:**

**Note: I understand this code a little bit from stack overflow!!**

#include <iostream>

#include <string>

using namespace std;

void Permutation(string, int, int);

int main()

{

string ptr;

cout << "Enter the string for Permutation : ";

cin >> ptr;

cout << "Following are the possible Permutations " << endl;

Permutation(ptr, 0, ptr.size() - 1);

cout << endl << endl;

system("pause");

}

void Permutation(string a, int b, int c)

{

if (b == c)

cout << endl << "Permutaion is : "<< a ;

else

{

for (int i = b; i <= c; i++)

{

swap(a[b], a[i]);

Permutation(a, b + 1, c);

swap(a[b], a[i]);

}

}

}

**A screenshot of a computer screen

Description automatically generated**

**Question Number 9:**

**PROGRAM:**

**Note: I understand this code a little bit from stack overflow!!**

#include <iostream>

#include <string>

using namespace std;

void Reversing\_char(char \*, char \*);

void Reversing\_Word(char \*, char \*,char \*);

int main()

{

char a[] = "Cat Is Running";

cout << endl <<"Original String is : "<< a;

Reversing\_Word(a,a,a);

cout << endl <<"Reversed String is : " << a;

cout << endl << endl;

system("pause");

}

void Reversing\_char(char \*a, char \*b)

{

if (a > b)

return ;

else

{

char temp = \*a;

\*a = \*b;

\*b = temp;

Reversing\_char(a + 1, b - 1);

}

}

void Reversing\_Word(char \*a, char \*b, char \*c)

{

if (\*c == '\0')

{

Reversing\_char(b, c - 1);

b = c + 1;

Reversing\_char(a, c - 1);

return;

}

if (\*c == ' ')

{

Reversing\_char(b, c - 1);

b = c + 1;

}

Reversing\_Word(a, b, c + 1);

}

**A screenshot of a computer screen

Description automatically generated**