2048: the game

Computer Science Project 18-19

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Class XII C, Roll No.15

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# Certificate



This is to certify that Hardik Shah of Class 12-C, Roll No. 15 has satisfactorily completed the computer science project for the academic year 2018-19 and has duly submitted the computer science project on time.

Signature of Teacher Signature of Inviligator

# Acknowledgements

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# System Requirements

Turbo C++ 3.0, Turbo C++ 4.5(Windows Vista, Windows 7; non-graphics mode).

## Operating System:

Windows 98, Windows 2000, Windows XP, Windows Vista, Windows 7(in small screen, non-graphics mode).

## RAM:

Minimum 256 MB and higher.

## Hard Disk Drive Space:

Minimum 10 MB of space and higher.

# Bibliography

1. Computer Science with C++, Class 11 by Sumita Arora
2. Computer Science with C++, Class 12 by Sumita Arora
3. <https://www.google.in>
4. <https://www.codestacks.com>
5. 2048 game by Ketchapp

# Overview of C++

This overview of C++ presents the key design, programming and language –technical concepts using examples to give the reader feel of the language.

C++ is a general purpose programming language with a bias towards system programming that supports efficient low- level computation, data abstraction,object oriented programming and generic programming. It was developed by Bjarne Stroustrup starting in 1979 at Bell Labs as an enhancement to the C Language features and originally named C with classes. It was renamed C++ in 1983.

A one of the most popular programming languages ever created, C++ is widely used in the software industry. Some of its applications domains include system software, application software, device drivers, embedded software, high-performance server and client applications, and entertainment software such as video games. Several groups provide both free and propiertary C++ compiler software, include the GNU Project, Microsoft, Intel and Borland. C++ has greatly influenced many other popular programming languages, most notably C# and Java.

# About the Game

2048 is a single-player sliding block puzzle game designed by Italian web developer Gabriele Cirulli. The game's objective is to slide numbered tiles on a grid to combine them to create a tile with the number 2048. However, one can continue to play the game after reaching the goal, creating tiles with larger numbers.

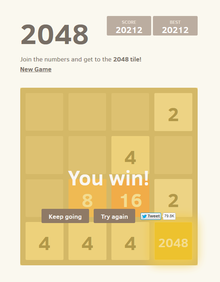
|  |  |
| --- | --- |
| **2048** | |
| [2048 logo.svg](https://en.wikipedia.org/wiki/File:2048_logo.svg) | |
| **Developer** | Gabriele Cirulli |
| **Publisher** | Solebon LLC |
| **Platform(s)** | Browser, iOS, Nintendo 3DS, Android, Apple TV |
| **Release** | Web: 9 March 2014[[1]](https://en.wikipedia.org/wiki/2048_(video_game)#cite_note-insider-1) |
| **Genre** | Puzzle |
| **Modes** | Single-player, Timed |

## Gameplay

2048 is played on a 4×4 grid, with numbered tiles that slide smoothly when a player moves them using the four arrow keys. Every turn, a new tile will randomly appear in an empty spot on the board with a value of either 2 or 4.[2] Tiles slide as far as possible in the chosen direction until they are stopped by either another tile or the edge of the grid. If two tiles of the same number collide while moving, they will merge into a tile with the total value of the two tiles that collided. The resulting tile cannot merge with another tile again in the same move. Higher-scoring tiles emit a soft glow.

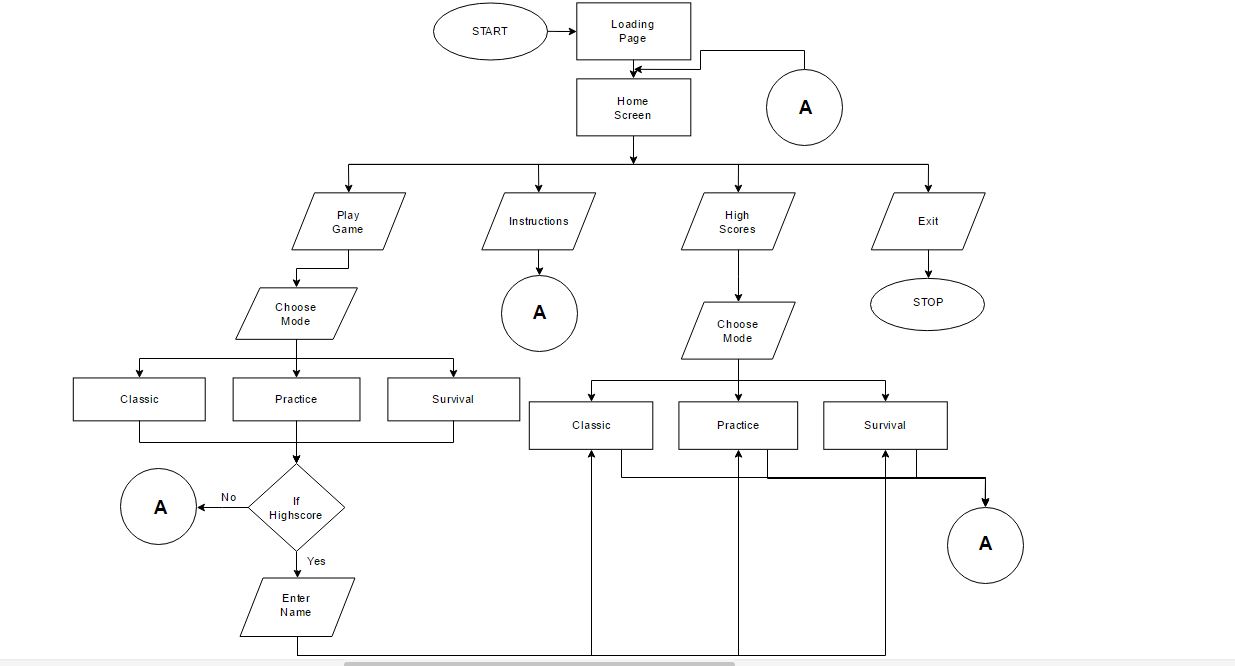
[](https://en.wikipedia.org/wiki/File:2048_Screenshot.png)A scoreboard on the upper-right keeps track of the user's score. The user's score starts at zero, and is incremented whenever two tiles combine, by the value of the new tile. As with many arcade games, the user's best score is shown alongside the current score.

*A game of 2048 in progress*

The game is won when a tile with a value of 2048 appears on the board, hence the name of the game. After reaching the 2048 tile, players can continue to play (beyond the 2048 tile) to reach higher scores. When the player has no legal moves (there are no empty spaces and no adjacent tiles with the same value), the game [](https://en.wikipedia.org/wiki/File:2048_win.png)ends.

*A completed game of 2048. The 2048 tile can be seen in the bottom-right corner.*

## Flowchart: Working of the Game



## Header Files Used

* #include <fstream.h>
* #include <conio.h>
* #include <string.h>
* #include <stdio.h>
* #include <math.h>
* #include <graphics.h>
* #include <process.h>
* #include <dos.h>
* #include <stdlib.h>
* #include <bios.h>
* #include <time.h>

## Classes Used

|  |  |
| --- | --- |
| **Name of Class** | **Members** |
| class backup C[2] | double B[6][6];  long bscore();  backup(); |
| class newposn INSERT[16]; | int I;  int J;  newposn(); |
| class score\_card obj; | char name[20][20];  long score\_save;  int name\_len;  void add();  void display();  score\_card(); |
| class virtualkeyboard G[26]; | char let[3];  int bkey[2]; |
| class Hall\_Of\_Fame N[20]; | char HOF\_Name[20][20];  long HOF;  int HOF\_Name\_Len; |

## User Defined functions:

* void storekey()
* void cover()
* void enter\_name(int p)
* void couldnt()
* void OVER(int wol)
* void score\_card:: display()
* void score\_card:: add()
* void i\_basic(int A[4][4],int slide)
* void instructions()
* void quit(int d)
* void convert\_score()
* void convert\_time()
* void print()
* void left()
* void right()
* void up()
* void down()
* void loadscreen()
* void initialize()
* void UNDO()
* void mode(int dop)
* void game()

# Source Code:

//Project 2018\_19: 2048 v5.0

//Source Code:

#include <fstream.h>

#include <conio.h>

#include <string.h>

#include <stdio.h>

#include <math.h>

#include <graphics.h>

#include <process.h>

#include <dos.h>

#include <stdlib.h>

#include <bios.h>

#include <time.h>

class backup // for use in undo function

{

public:

double B[6][6];

long bscore;

backup()

{

for(i=0;i<4;i++) // to clear the grid

{

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

{

B[i][j]=0;

bscore=0;

}

}

}

}C[2];

class newposn //insert random number every turn

{

public:

int I;

int J;

newposn()

{

I=0;

J=0;

}

}INSERT[16];

class score\_card

{

char name[20][20];

long score\_save;

int name\_len;

public:

void add();

void display();

score\_card()

{

name\_len=3;

}

} obj;

class virtualkeyboard

{

public:

char let[3];

int bkey[2];

}G[26];

class Hall\_Of\_Fame

{

public:

char HOF\_Name[20][20];

long HOF;

int HOF\_Name\_Len;

}N[20];

void storekey()

{

int k1=0;

G[k1].bkey[0]=4209;G[k1].bkey[1]=4177;strcpy(G[k1].let,"Q");k1++;

G[k1].bkey[0]=4471;G[k1].bkey[1]=4439;strcpy(G[k1].let,"W");k1++;

G[k1].bkey[0]=4709;G[k1].bkey[1]=4677;strcpy(G[k1].let,"E");k1++;

G[k1].bkey[0]=4978;G[k1].bkey[1]=4946;strcpy(G[k1].let,"R");k1++;

G[k1].bkey[0]=5236;G[k1].bkey[1]=5204;strcpy(G[k1].let,"T");k1++;

G[k1].bkey[0]=5497;G[k1].bkey[1]=5465;strcpy(G[k1].let,"Y");k1++;

G[k1].bkey[0]=5749;G[k1].bkey[1]=5717;strcpy(G[k1].let,"U");k1++;

G[k1].bkey[0]=5993;G[k1].bkey[1]=5961;strcpy(G[k1].let,"I");k1++;

G[k1].bkey[0]=6255;G[k1].bkey[1]=6223;strcpy(G[k1].let,"O");k1++;

G[k1].bkey[0]=6512;G[k1].bkey[1]=6480;strcpy(G[k1].let,"P");k1++;

G[k1].bkey[0]=7777;G[k1].bkey[1]=7745;strcpy(G[k1].let,"A");k1++;

G[k1].bkey[0]=8051;G[k1].bkey[1]=8019;strcpy(G[k1].let,"S");k1++;

G[k1].bkey[0]=8292;G[k1].bkey[1]=8260;strcpy(G[k1].let,"D");k1++;

G[k1].bkey[0]=8550;G[k1].bkey[1]=8518;strcpy(G[k1].let,"F");k1++;

G[k1].bkey[0]=8807;G[k1].bkey[1]=8775;strcpy(G[k1].let,"G");k1++;

G[k1].bkey[0]=9064;G[k1].bkey[1]=9032;strcpy(G[k1].let,"H");k1++;

G[k1].bkey[0]=9322;G[k1].bkey[1]=9290;strcpy(G[k1].let,"J");k1++;

G[k1].bkey[0]=9579;G[k1].bkey[1]=9547;strcpy(G[k1].let,"K");k1++;

G[k1].bkey[0]=9836;G[k1].bkey[1]=9804;strcpy(G[k1].let,"L");k1++;

G[k1].bkey[0]=11386;G[k1].bkey[1]=11354;strcpy(G[k1].let,"Z");k1++;

G[k1].bkey[0]=11640;G[k1].bkey[1]=11608;strcpy(G[k1].let,"X");k1++;

G[k1].bkey[0]=11875;G[k1].bkey[1]=11843;strcpy(G[k1].let,"C");k1++;

G[k1].bkey[0]=12150;G[k1].bkey[1]=12118;strcpy(G[k1].let,"V");k1++;

G[k1].bkey[0]=12386;G[k1].bkey[1]=12354;strcpy(G[k1].let,"B");k1++;

G[k1].bkey[0]=12654;G[k1].bkey[1]=12622;strcpy(G[k1].let,"N");k1++;

G[k1].bkey[0]=12909;G[k1].bkey[1]=12877;strcpy(G[k1].let,"M");

}

//global declaration of variables

int maxx,maxy,midx,midy,midy1; //graphic variables

int i,j,k,m,m1[10],m2=0,n,c; //loop variables

int undo,tp=0,flag=1,over=1,key,a,b,new1,new2,new3,decider; //logical variables

int T,DELAY;

int ft;

long score=0;

int const y=0;

double A[6][6];

// A character array to use in outtextxy function

char NUM[][5]={"2","4","8","16","32","64","128","256","512","1024","2048"};

char basearray[][10]={"0","1","2","3","4","5","6","7","8","9"};

char fname[11];

// Array to insert random numbers after each move

// Notice that probability of 2 is more than 4

int X[]={2,2,4,2,2,2,2,2,2,4};

void cover()

{

void mode(int);

void quit(int);

void instructions();

int n=0,position=0;

score=0;

char opt[][20]={"PLAY GAME","INSTRUCTIONS","LEADERBOARDS","CREDITS","EXIT"};

cleardevice();

if(ft==0)

{

ft++;

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

for(i=0; i<11; i++)

{

settextstyle(0,0,i+1);

setcolor(i+5);

outtextxy(midx, midy-125, NUM[i]);

delay(50 + 50\*i);

if(i!=10)

{

setcolor(0);

outtextxy(midx, midy-125, NUM[i]);

}

else

break;

}

}

else

{

setcolor(ft);

settextstyle(0,0,11);

settextjustify(1,1);

outtextxy(midx, midy-125, NUM[10]);

ft++;

if(ft==15)

ft=1;

}

int key,xco;

setcolor(WHITE);

settextstyle(0,HORIZ\_DIR,8);

settextjustify(1,1);

setfillstyle(1,0);

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

xco=midx;

settextstyle(0,0,3);

setcolor(0);

setfillstyle(1,15);

bar(xco-150,midy+(35\*position)-18,xco+150,midy+15+(35\*position));

outtextxy(xco,midy+(35\*position),opt[position]);

settextstyle(0,HORIZ\_DIR,2);

setcolor(15);

outtextxy(xco,midy+35,"INSTRUCTIONS");

outtextxy(xco,midy+70,"LEADERBOARDS");

outtextxy(xco,midy+105,"CREDITS");

outtextxy(xco,midy+140,"EXIT");

settextstyle(2,0,4);

settextjustify(0,1);

outtextxy(2,maxy-20,"Use arrow keys to choose. Press ENTER key to continue.");

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

while(n==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==18432 && position>=0)

{

settextstyle(0,0,2);

setcolor(15);

setfillstyle(1,0);

bar(xco-150,midy+(35\*position)-18,xco+150,midy+15+(35\*position));

outtextxy(xco,midy+(35\*position),opt[position]);

if(position==0)

position=4;

else

position--;

settextstyle(0,0,3);

setcolor(0);

setfillstyle(1,15);

bar(xco-150,midy+(35\*position)-18,xco+150,midy+15+(35\*position));

outtextxy(xco,midy+(35\*position),opt[position]);

}

else if(key==20480 && position<=4)

{

settextstyle(0,0,2);

setcolor(15);

setfillstyle(1,0);

bar(xco-150,midy+(35\*position)-18,xco+150,midy+15+(35\*position));

outtextxy(xco,midy+(35\*position),opt[position]);

if(position==4)

position=0;

else

position++;

settextstyle(0,0,3);

setcolor(0);

setfillstyle(1,15);

bar(xco-150,midy+(35\*position)-18,xco+150,midy+15+(35\*position));

outtextxy(xco,midy+(35\*position),opt[position]);

}

else if(key==7181)

break;

}

if(position==0)

mode(0);

else if(position==1)

instructions();

else if(position==2)

mode(2);

else if(position==3)

quit(0);

else if(position==4)

quit(1);

}

void enter\_name(int p)

{

int ifloop=0,sft=0,t=0,bac[20];

storekey();

setfillstyle(1,15);

bar(midx-150,midy1-10,midx+150,midy1+25);

bar(midx-150,midy1-10,midx-140,midy1+70);

bar(midx+150,midy1-10,midx+140,midy1+70);

bar(midx-150,midy1+60,midx+150,midy1+70);

if(p==0)

{

settextjustify(1,1);

settextstyle(3,0,4);

setcolor(9);

outtextxy(midx,midy1-90,"NEW HIGHSCORE!!");

settextstyle(3,0,3);

outtextxy(midx,midy1-60,"Congratulations");

}

else

{

settextjustify(1,1);

settextstyle(3,0,4);

setcolor(9);

outtextxy(midx,midy1-90,"CONGRATULATIONS");

settextstyle(3,0,3);

outtextxy(midx,midy1-60,"You made it to the HALL OF FAME!");

}

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

outtextxy(2,maxy-20,"Type your name and press ENTER key to submit.");

setcolor(0);

settextstyle(2,0,7);

settextjustify(1,1);

for(i=0;i<2;i++)

outtextxy(midx-45+i,midy1+7,"Enter Your Name:");

settextstyle(3,0,3);

setcolor(15);

while(ifloop==0)

{

while(kbhit()==0)

{

setcolor(WHITE);

line(190+sft,272,190+sft,293);

delay(150);

setcolor(BLACK);

line(190+sft,272,190+sft,293);

delay(100);

}

while (bioskey(1) == 0);

key = bioskey(0);

if(key==3592 && t>0) //backspace

{

t--;

setcolor(0);

sft-=15;

outtextxy(midx-125+sft,midy1+40,G[bac[t]].let);

}

else if(key==14624) //space

{

strcpy(N[p].HOF\_Name[t]," ");

sft+=15;

t++;

}

else if(key==7181) //enter

{

ifloop=1;

N[p].HOF\_Name\_Len=t-1;

}

else

{

for(i=0;i<26;i++)

{

if(key==G[i].bkey[0] || key==G[i].bkey[1])

{

bac[t]=i;

strcpy(N[p].HOF\_Name[t],G[i].let);

setcolor(15);

outtextxy(midx-125+sft,midy1+40,G[i].let);

sft+=15;

t++;

}

}

}

}

}

void couldnt()

{

cleardevice();

settextjustify(1,1);

settextstyle(3,0,4);

setcolor(9);

outtextxy(midx,midy1-15,"SORRY!");

settextstyle(3,0,3);

outtextxy(midx,midy1+15,"You could not make it to the HALL OF FAME!");

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

outtextxy(2,maxy-20,"Press ENTER key to continue to the homescreen.");

settextjustify(1,1);

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

cover();

}

}

void OVER(int wol)

{

void cover();

cleardevice();

int y=0;

setcolor(9);

settextstyle(0,0,7);

settextjustify(1,1);

if(wol==0)

outtextxy(midx,midy1-50,"GAME OVER");

else if(wol==1)

outtextxy(midx,midy1-50,"YOU WIN!");

setcolor(15);

settextstyle(3,0,2);

outtextxy(midx-35,midy1,"Your Score: ");

int r,p1=0,AA=0,number[12];

long x;

x=score;

if (x==0)

{

setcolor(15);

outtextxy(midx+35+AA,midy1,"00");

}

else

{

while (x > 0)

{

r=x%10;

x=x/10;

number[p1]=r;

p1++;

}

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

{

setcolor(15);

outtextxy(midx+35+AA,midy1,basearray[number[p1-j-1]]);

AA+=15;

}

}

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

outtextxy(2,maxy-20,"Press ENTER key to continue.");

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

{

cleardevice();

obj.add();

obj.display();

}

}

}

void score\_card:: display()

{

cleardevice();

void mode(int);

int r,p1,number[12],AA,sft=0,y=0,d;

long x;

d=decider;

int color[3]={14,7,6};

for(j=0;j<3;j++)

{

setcolor(color[j]);

setfillstyle(1,color[j]);

pieslice(midx-200,midy-75+(25\*j),0,360,7);

setcolor(0);

settextstyle(0,0,1);

settextjustify(1,1);

outtextxy(midx-200,midy-75+(25\*j),basearray[j+1]);

}

settextjustify(1,1);

settextstyle(3,0,7);

setcolor(9);

outtextxy(midx,midy1-209,"HALL OF FAME");

outtextxy(midx,midy1-210,"HALL OF FAME");

outtextxy(midx,midy1-211,"HALL OF FAME");

outtextxy(midx-1,midy1-210,"HALL OF FAME");

outtextxy(midx+1,midy1-210,"HALL OF FAME");

setcolor(0);

outtextxy(midx,midy1-210,"HALL OF FAME");

setfillstyle(1,9);

bar(100,75,530,80);

setfillstyle(1,0);

bar(105,77,525,78);

setfillstyle(1,12);

bar(250,140,385,142);

settextstyle(3,0,4);

setcolor(12);

if(d==0)

outtextxy(midx,120,"PRACTICE");

else if(d==1)

outtextxy(midx,120,"CLASSIC");

else if(d==2)

outtextxy(midx,120,"SURVIVAL");

fstream fio;

fio.open(fname,ios::in);//open file in input mode

fio.seekg(0);//set file pointer to first object

fio.read((char\*)&obj,sizeof(obj));

i=0;

while(!fio.eof())

{

setcolor(15);

settextstyle(3,0,2);

x=obj.score\_save;

p1=0;

AA=0;

sft=0;

while (x > 0)

{

r=x%10;

x=x/10;

number[p1]=r;

p1++;

}

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

{

setcolor(15);

outtextxy(midx+140+AA,175+(25\*i),basearray[number[p1-j-1]]);

AA+=15;

}

settextstyle(3,0,3);

setcolor(15);

for(j=0;j<=obj.name\_len;j++)

{

outtextxy(midx-175+sft,175+(25\*i),obj.name[j]);

sft+=15;

}

i++;

fio.read((char\*)&obj,sizeof(obj));

}

fio.close();

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

outtextxy(2,maxy-20,"Press ENTER key to continue.");

outtextxy(2,maxy-40,"Press BACKSPACE key to go back.");

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181) //enter

cover();

else if(key==3592) //backspace

mode(2);

}

}

void score\_card:: add()

{

fstream fin,fout;

fin.open(fname,ios::in);//open file in input mode

fin.seekg(0);//set file pointer to first object

int y;

i=0;

fin.read((char\*)&obj,sizeof(obj));

while(!fin.eof())

{

N[i].HOF=obj.score\_save;

N[i].HOF\_Name\_Len=obj.name\_len;

for(j=0;j<=N[i].HOF\_Name\_Len;j++)

strcpy(N[i].HOF\_Name[j],obj.name[j]);

i++;

fin.read((char\*)&obj,sizeof(obj));

}

for(i=9; i>=0; i--)

{

if(score<=N[i].HOF)

break;

}

if(i==9)

couldnt();

else

{

for(j=9; j>i+1; j--)

{

N[j].HOF=N[j-1].HOF;

N[j].HOF\_Name\_Len=N[j-1].HOF\_Name\_Len;

for(y=0;y<=N[j-1].HOF\_Name\_Len;y++)

strcpy(N[j].HOF\_Name[y],N[j-1].HOF\_Name[y]);

}

N[i+1].HOF=score;

enter\_name(i+1);

fout.open("temp.txt",ios::app);//open temporary file

for(i=0; i<10; i++)

{

obj.score\_save=N[i].HOF;

obj.name\_len=N[i].HOF\_Name\_Len;

for(y=0;y<=N[i].HOF\_Name\_Len;y++)

strcpy(name[y],N[i].HOF\_Name[y]);

fout.write((char\*)&obj,sizeof(obj));

}

fin.close();

fout.close();

remove(fname);//delete old file

rename("temp.txt",fname);//rename temporary file as master file

}

}

void i\_basic(int Ai[4][4],int slide)

{

cleardevice();

int nmidy;

nmidy=midy+35;

settextstyle(0,0,4);

settextjustify(1,1);

setcolor(9);

outtextxy(midx,midy-200,"INSTRUCTIONS");

setfillstyle(1,15);

// for grid

for(i=-2;i<=2;i++) //columns

bar(midx+(60\*i)-1,nmidy-121,midx+(60\*i)+1,nmidy+121);

for(i=-2;i<=2;i++) // rows

bar(midx-121,nmidy+(60\*i)-1,midx+121,nmidy+(60\*i)+1);

settextstyle(0,0,2);

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

{

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

{

m=Ai[i][j];

if(m!=0)

{

n=log10(m)/log10(2);

setfillstyle(1,0);

bar(midx-116+(60\*j),nmidy-116+(60\*i),midx-64+(60\*j),nmidy-64+(60\*i));

setcolor(n);

setfillstyle(1, n);

bar(midx-116+(60\*j),nmidy-116+(60\*i),midx-64+(60\*j),nmidy-64+(60\*i));

if(m==2048)

settextstyle(0,0,1);

else

settextstyle(0,0,2);

setcolor(0);

outtextxy(midx-90+(60\*j),nmidy-90+(60\*i),NUM[n-1]);

}

}

}

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

if(slide!=3)

outtextxy(2,maxy-15,"Press ENTER key to go to next page");

else

outtextxy(2,maxy-15,"Press ENTER key to continue to homescreen.");

settextjustify(1,1);

setcolor(15);

setfillstyle(1,15);

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

circle(midx-18+(12\*i),midy+180,3);

floodfill(midx-18+(12\*slide),midy+180,15);

}

void instructions()

{

int slide,nmidy;

int A1[][4]={0,0,0,0,0,4,0,0,0,0,0,8,0,16,0,0};

int A2[][4]={0,0,0,0,0,2,2,4,0,0,0,0,0,4,4,8};

int A3[][4]={16,128,32,16,4,512,16,8,8,64,8,4,2,8,4,2};

int A4[][4]={0,2,4,0,8,2048,32,2,4,32,128,4,16,2,4,2};

nmidy=midy+35;

slide=0;

i\_basic(A1,slide);

setcolor(15);

settextstyle(6,0,2);

outtextxy(midx,midy-160,"Use Arrow Keys to move all tiles.");

outtextxy(midx,midy-140,"For eg. On pressing right arrow key all tiles ");

outtextxy(midx,midy-120," move to the extreme right of the grid.");

setfillstyle(1,6);

setcolor(6);

bar(midx-65,midy+2,midx-100,midy+8);

line(midx-100,midy-5,midx-100,midy+15);

line(midx-110,midy+5,midx-100,midy-5);

line(midx-110,midy+5,midx-100,midy+15);

setfillstyle(1,6);

floodfill(midx-105,midy+5,6);

bar(midx-65,midy+122,midx-100,midy+128);

line(midx-100,midy+115,midx-100,midy+135);

line(midx-110,midy+125,midx-100,midy+115);

line(midx-110,midy+125,midx-100,midy+135);

floodfill(midx-105,midy+125,6);

bar(midx+55,midy+62,midx-100,midy+68);

line(midx-100,midy+55,midx-100,midy+75);

line(midx-110,midy+65,midx-100,midy+55);

line(midx-110,midy+65,midx-100,midy+75);

floodfill(midx-105,midy+65,6);

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

break;

}

slide++;

i\_basic(A2,slide);

setcolor(15);

settextstyle(6,0,2);

outtextxy(midx,midy-160,"When two tiles with the same");

outtextxy(midx,midy-140,"number touch,they merge into one!");

outtextxy(midx,midy-120,"It's over when the board fills up...");

setfillstyle(1,4);

bar(midx-4,nmidy-12,midx+4,nmidy-48);

bar(midx-18,nmidy-26,midx+18,nmidy-34);

bar(midx-4,nmidy-12+120,midx+4,nmidy-48+120);

bar(midx-18,nmidy+94,midx+18,nmidy+86);

bar(midx-16+60,nmidy-26-6,midx+16+60,nmidy-34-6);

bar(midx-16+60,nmidy-26+6,midx+16+60,nmidy-34+6);

bar(midx-16+60,nmidy-26-6+120,midx+16+60,nmidy-34-6+120);

bar(midx-16+60,nmidy-26+6+120,midx+16+60,nmidy-34+6+120);

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

break;

}

slide++;

i\_basic(A3,slide);

setcolor(15);

settextstyle(6,0,2);

outtextxy(midx,midy-160,"Join the numbers and get to the 2048 tile to win!");

outtextxy(midx,midy-140,"You lose when the grid is completely filled");

outtextxy(midx,midy-120,"and there is no possibility of merging of any two tiles....");

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

break;

}

slide++;

i\_basic(A4,slide);

setcolor(15);

settextstyle(6,0,2);

outtextxy(midx,midy-170,"Practice Mode: You can undo one move backwards.");

outtextxy(midx,midy-150,"Classic Mode: You cannot undo your move...");

outtextxy(midx,midy-130,"Survival Mode: Start with a countdown of 5 sec.");

outtextxy(midx,midy-110,"Get one sec each time you create a tile greater than or equal to 8.");

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

break;

}

cover();

}

void quit(int d)

{

cleardevice();

int nmidy;

nmidy=midy+190;

settextstyle(9,HORIZ\_DIR,5);

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

setcolor(15);

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

outtextxy(midx-2+i,50,"Credits") ;

settextstyle(6,HORIZ\_DIR,3);

outtextxy(midx,120,"A very sincere and heartfelt thank you to");

settextstyle(2,HORIZ\_DIR,18);

outtextxy(midx,150,"SMRITI MAAM");

settextstyle(6,HORIZ\_DIR,3);

outtextxy(midx,200,"EFFORTS BY:");

settextstyle(6,HORIZ\_DIR,4);

setcolor(15);

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

outtextxy(midx,240,"Mridul Mittal") ;

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

outtextxy(midx,270,"Jainil Shah") ;

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

outtextxy(midx,300,"Hardik Shah") ;

setcolor(LIGHTCYAN);

setlinestyle(0,0,3);

line(midx-50,nmidy-10,midx,nmidy-100);

line(midx,nmidy-100,midx+50, nmidy-10);

line(midx-50,nmidy-10,midx+50, nmidy-10);

line(midx, nmidy-100, midx, nmidy-10);

circle(midx, nmidy-39, 29);

setlinestyle(0,0,1);

setcolor(RED);

settextstyle(6,HORIZ\_DIR,3);

outtextxy(midx+1,nmidy,"PRODUCTIONS");

outtextxy(midx+2,nmidy,"PRODUCTIONS");

outtextxy(midx+3,nmidy,"PRODUCTIONS");

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

if(d==0)

outtextxy(2,maxy-20,"Press ENTER key to return");

else if(d==1)

outtextxy(2,maxy-20,"Press ENTER key to exit");

while(y==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==7181)

break;

}

if(d==0)

cover();

else if(d==1)

{

cleardevice();

exit(0);

}

}

void convert\_score()

{

int Z=1;

int number[12],r, p1=0;

int NUMBER[12],R,P1=0;

long x,X;

setcolor(WHITE);

settextstyle(3,0,1);

outtextxy(70,10,"Your Score: ");

x=score;

X=C[0].bscore;

setcolor(WHITE);

settextstyle(3,0,2);

if(x==0)

outtextxy(138,10,"00");

if(x!=0 && Z!=0)

{

setcolor(BLACK);

outtextxy(138,10,"00");

Z=0;

}

while (x > 0)

{

r=x%10;

x=x/10;

number[p1]=r;

p1++;

}

while (X > 0)

{

R=X%10;

X=X/10;

NUMBER[P1]=R;

P1++;

}

int AA=0,MM=0;

for(i=0; i<P1; i++)

{

setcolor(BLACK);

outtextxy(130+MM,10,basearray[NUMBER[P1-i-1]]);

MM+=15;

}

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

{

setcolor(WHITE);

outtextxy(130+AA,10,basearray[number[p1-i-1]]);

AA+=15;

}

settextstyle(0,0,2);

}

void convert\_time()

{

int x;

int number[12],r, p1=0;

setcolor(WHITE);

settextstyle(3,0,1);

outtextxy(470,10,"Time: ");

x=T;

setcolor(WHITE);

settextstyle(3,0,2);

while (x > 0)

{

r=x%10;

x=x/10;

number[p1]=r;

p1++;

}

int AA=0;

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

{

setcolor(WHITE);

outtextxy(500+AA,10,basearray[number[p1-i-1]]);

AA+=15;

}

settextstyle(0,0,2);

}

void print()

{

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

{

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

{

m=A[i][j];

n=0;

if(m!=0)

{

n=log10(m)/log10(2);

setfillstyle(1,0);

bar(midx-156+(80\*j),midy-156+(80\*i),midx-84+(80\*j),midy-84+(80\*i));

setcolor(n);

setfillstyle(1, n);

bar(midx-156+(80\*j),midy-156+(80\*i),midx-84+(80\*j),midy-84+(80\*i));

setcolor(0);

outtextxy(midx-120+(80\*j), midy-120+(80\*i),NUM[n-1]);

}

else

{

setfillstyle(1,0);

setcolor(0);

bar(midx-156+(80\*j),midy-156+(80\*i),midx-84+(80\*j),midy-84+(80\*i));

}

}

}

}

void left() //left arrow key

{

for(c=0;c<2;c++)

{

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

{

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

{

if(A[i][j]==0)

{

for(k=j;k<4;k++)

A[i][k]=A[i][k+1];

A[i][3]=0;

}

}

}

}

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

{

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

{

if(A[i][j]==A[i][j+1])

{

A[i][j]\*=2;

if(A[i][j]!=0)

{

m1[m2]=A[i][j];

m2++;

}

score+=A[i][j];

for(k=j+1;k<4;k++)

A[i][k]=A[i][k+1];

A[i][3]=0;

}

}

}

}

void right() ///right arrow key

{

for(c=0;c<2;c++)

{

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

{

for(j=3;j>=0;j--)

{

if(A[i][j]==0)

{

for(k=j;k>=0;k--)

A[i][k]=A[i][k-1];

A[i][0]=0;

}

}

}

}

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

{

for(j=3;j>=0;j--)

{

if(A[i][j]==A[i][j-1])

{

A[i][j]\*=2;

if(A[i][j]!=0)

{

m1[m2]=A[i][j];

m2++;

}

score+=A[i][j];

for(k=j-1;k>=0;k--)

A[i][k]=A[i][k-1];

A[i][0]=0;

}

}

}

}

void up() //up arrow key

{

for(c=0;c<2;c++)

{

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

{

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

{

if(A[j][i]==0)

{

for(k=j;k<4;k++)

A[k][i]=A[k+1][i];

A[3][i]=0;

}

}

}

}

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

{

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

{

if(A[j][i]==A[j+1][i])

{

A[j][i]\*=2;

if(A[j][i]!=0)

{

m1[m2]=A[j][i];

m2++;

}

score+=A[j][i];

for(k=j+1;k<4;k++)

A[k][i]=A[k+1][i];

A[3][i]=0;

}

}

}

}

void down() //down arrow key

{

for(c=0;c<2;c++)

{

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

{

for(j=3;j>=0;j--)

{

if(A[j][i]==0)

{

for(k=j;k>=0;k--)

A[k][i]=A[k-1][i];

A[0][i]=0;

}

}

}

}

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

{

for(j=3;j>=0;j--)

{

if(A[j][i]==A[j-1][i])

{

A[j][i]\*=2;

if(A[j][i]!=0)

{

m1[m2]=A[j][i];

m2++;

}

score+=A[j][i];

for(k=j-1;k>=0;k--)

A[k][i]=A[k-1][i];

A[0][i]=0;

}

}

}

}

void loadscreen()

{

cleardevice();

int endangle,radius=110,t=0,x;

setcolor(2);

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

char h[][40]={"defining variables","loading header files...",

"#include<iostream.h>","#include<conio.h>","#include<string.h>",

"#include<stdio.h>","#include<math.h>","#include<graphics.h>",

"#include<process.h>","#include<dos.h>","#include<stdlib.h>",

"creating functions","loading 2048","defining database","extracting directory",

"printing virtual grid","loading homescreen"};

setcolor(GREEN);

settextstyle(6,HORIZ\_DIR,6);

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

outtextxy(midx-2+i,midy+170,"...LOADING...");

settextstyle(0,HORIZ\_DIR,4);

outtextxy(midx,50,"A VENTURE BY");

setcolor(LIGHTCYAN);

setlinestyle(0,0,3);

line(midx-50,midy-10,midx,midy-100);

line(midx,midy-100,midx+50, midy-10);

line(midx-50,midy-10,midx+50, midy-10);

line(midx, midy-100, midx, midy-10);

circle(midx, midy-39, 29);

setlinestyle(0,0,1);

setcolor(RED);

settextstyle(6,HORIZ\_DIR,3);

outtextxy(midx+1,midy,"PRODUCTIONS");

outtextxy(midx+2,midy,"PRODUCTIONS");

outtextxy(midx+3,midy,"PRODUCTIONS");

for(endangle=90;endangle<=450;endangle++)

{

delay(8);

setcolor(15);

arc(midx, midy-30,90, endangle, radius);

for(i=0;i<=10;i++)

arc(midx, midy-30,90, endangle, radius-i);

x=endangle%20;

if(x==0)

{

setfillstyle(1,0);

bar(midx-150,midy+100,midx+150,midy+140);

setcolor(YELLOW);

settextstyle(6,HORIZ\_DIR,3);

outtextxy(midx,midy+120,h[t]);

t++;x++;

}

}

setcolor(CYAN);

settextstyle(6,HORIZ\_DIR,5);

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

outtextxy(midx-2+i,midy+120,"READY!");

delay(800);

cleardevice();

}

void initialize()

{

void game();

score=0;

T=5;

for(i=0;i<4;i++) // to clear the grid

{

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

{

C[0].B[i][j]=0;

C[0].bscore=0;

C[1].B[i][j]=0;

C[1].bscore=0;

}

}

for(i=0; i<16; i++)

{

INSERT[i].I=0;

INSERT[j].J=0;

}

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

{

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

A[i][j]=0;

}

setfillstyle(1,15);

cleardevice();

// for grid

for(i=-2;i<=2;i++) //columns

bar(midx+(80\*i)-1,midy-161,midx+(80\*i)+1,midy+161);

for(i=-2;i<=2;i++) // rows

bar(midx-161,midy+(80\*i)-1,midx+161,midy+(80\*i)+1);

settextjustify(1,1);

setcolor(6);

settextstyle(0,0,5);

outtextxy(midx+5,midy-205,"2048");

settextstyle(2,0,4);

settextjustify(0,1);

setcolor(15);

outtextxy(2,maxy-20,"Press ENTER/ESC key to quit");

settextjustify(1,1);

settextstyle(0,0,2);

for(i=0;i<2;i++)

{

new1=random(4);

new2=random(4);

new3=random(9);

A[new1][new2]=X[new3];

C[1].B[new1][new2]=X[new3];

C[1].bscore=score;

print();

}

game();

}

void UNDO()

{

undo=0;

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

{

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

A[i][j]=C[0].B[i][j];

}

C[1].bscore=C[0].bscore;

C[0].bscore=score;

score=C[1].bscore;

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

{

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

C[1].B[i][j]=C[0].B[i][j];

}

print();

}

void mode(int dop)

{

cleardevice();

settextstyle(9,HORIZ\_DIR,5);

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

setcolor(15);

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

outtextxy(midx-2+i,50,"Choose Mode") ;

int n=0,position=-1;

char opt[][20]={"PRACTICE","CLASSIC","SURVIVAL"};

setfillstyle(1,0);

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

settextstyle(0,0,5);

setfillstyle(1,15);

setcolor(0);

bar(midx-200,midy+(50\*position)-30,midx+200,midy+20+(50\*position));

outtextxy(midx,midy+(50\*position),opt[position+1]);

settextstyle(0,0,3);

setcolor(15);

outtextxy(midx,midy,"CLASSIC");

outtextxy(midx,midy+50,"SURVIVAL");

settextstyle(2,0,4);

settextjustify(0,1);

outtextxy(2,maxy-20,"Use arrow keys to choose.Press ENTER key to continue.");

outtextxy(2,maxy-40,"Press BACKSPACE key to go back.");

settextjustify(CENTER\_TEXT,CENTER\_TEXT);

while(n==0)

{

while (bioskey(1) == 0);

key = bioskey(0);

if(key==18432 && position>=-1)

{

settextstyle(0,0,3);

setfillstyle(1,0);

setcolor(15);

bar(midx-200,midy+(50\*position)-30,midx+200,midy+20+(50\*position));

outtextxy(midx,midy+(50\*position),opt[position+1]);

if(position==-1)

position=1;

else

position--;

settextstyle(0,0,5);

setfillstyle(1,15);

setcolor(0);

bar(midx-200,midy+(50\*position)-30,midx+200,midy+20+(50\*position));

outtextxy(midx,midy+(50\*position),opt[position+1]);

}

else if(key==20480 && position<=1)

{

settextstyle(0,0,3);

setfillstyle(1,0);

setcolor(15);

bar(midx-200,midy+(50\*position)-30,midx+200,midy+20+(50\*position));

outtextxy(midx,midy+(50\*position),opt[position+1]);

if(position==1)

position=-1;

else

position++;

settextstyle(0,0,5);

setfillstyle(1,15);

setcolor(0);

bar(midx-200,midy+(50\*position)-30,midx+200,midy+20+(50\*position));

outtextxy(midx,midy+(50\*position),opt[position+1]);

}

else if(key==3592) //backspace

cover();

else if(key==7181)

break;

}

if(position==-1)

{

decider=0;

strcpy(fname,"scorep.txt");

}

else if(position==0)

{

decider=1;

strcpy(fname,"scorec.txt");

}

else if(position==1)

{

decider=2;

strcpy(fname,"scores.txt");

}

if(dop==0)

initialize();

else if(dop==2)

obj.display();

}

void game()

{

T=5;

DELAY=0;

score=0;

tp=0;

while(tp==0)

{

timer:;

convert\_score();

flag=0;

undo=1;

if(decider==2)

{

while(kbhit()==0)

{

convert\_time();

delay(1);

DELAY++;

if(DELAY==450)

{

T--;

setfillstyle(1,0);

bar(450,0,560,50);

if(T<0)

{

over=0;

goto b;

}

DELAY=0;

}

}

}

while (bioskey(1) == 0);

key = bioskey(0);

if(key==19200) //left arrow

left();

else if(key==19712) //right arrow key

right();

else if(key==18432) //up arrow key

up();

else if(key==20480) //down arrow key

down();

else if((key==5749||key==5717) && decider==0) //undo: U or u

UNDO();

else if(key==7181 || key==283) //exit: enter key or esc

OVER(0);

else

goto end;

if(undo!=0)

{

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

{

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

{

if(C[1].B[i][j]!=A[i][j])

flag++;

}

}

}

a=0;

over=0;

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

{

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

{

if(A[i][j]==0)

{

INSERT[a].J=j;

INSERT[a].I=i;

a++;

}

}

}

if(a!=0 && undo!=0)

{

if(flag!=0)

{

new1=random(9);

new2=random(a);

A[INSERT[new2].I][INSERT[new2].J]=X[new1];

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

{

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

C[0].B[i][j]=C[1].B[i][j];

}

C[0].bscore=C[1].bscore;

C[1].bscore=score;

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

{

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

C[1].B[i][j]=A[i][j];

}

print();

}

}

for(i=0;i<4;i++) //to check end of game

{

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

{

if(A[i][j]==0)

over++;

if(A[i][j]==A[i][j+1] || A[i][j]==A[i+1][j])

over++;

if(A[i][j]==2048)

{

OVER(1);

delay(250);

}

}

}

b:;

if(over==0)

{

delay(1000);

OVER(0);

}

if(decider==2)

{

for(i=0;i<m2;i++)

{

if(m1[i]>=8)

{ setfillstyle(1,0);

bar(450,0,560,50);

T++;

convert\_time();

}

}

}

m2=0;

end:

}

}

void main()

{

/\* request auto detection \*/

int gdriver = DETECT, gmode, errorcode;

/\* initialize graphics and local variables \*/

initgraph(&gdriver, &gmode, "c:\\turboc3\\bgi");

/\* read result of initialization \*/

errorcode = graphresult();

if (errorcode != grOk) /\* an error occurred \*/

{

printf("Graphics error: %s\n", grapherrormsg(errorcode));

printf("Press any key to halt:");

getch();

exit(1); /\* terminate with an error code \*/

}

randomize();

maxx=getmaxx();

maxy=getmaxy();

midx=maxx/2;

midy1=maxy/2;

midy=(maxy/2)+15;

ft=0;

storekey();

loadscreen();

cover();

cleardevice();

closegraph();

}

//------END------//

# Screen Shots

