Lab Manual

CS602 – Computer Graphics

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Lab 7

Write the C Program to draw circle by using Midpoint Circle algorithm having center at 50th row and 50th column and radius length of 15 pixels.

```
#include<iostream.h>
#include<graphics.h>
 void drawcircle(int x0, int y0, int radius)
{
   int x = radius;
   int y = 0;
   int err = 0;
    while (x >= y)
   {
   putpixel(x0 + x, y0 + y, 7);
   putpixel(x0 + y, y0 + x, 7);
   putpixel(x0 - y, y0 + x, 7);
   putpixel(x0 - x, y0 + y, 7);
   putpixel(x0 - x, y0 - y, 7);
   putpixel(x0 - y, y0 - x, 7);
   putpixel(x0 + y, y0 - x, 7);
   putpixel(x0 + x, y0 - y, 7);

   if (err <= 0)
   {
      y += 1;
      err += 2*y + 1;
   }
    if (err > 0)
   {
      x -= 1;
```

```
        err -= 2*x + 1;
    }
    }
}
 int main()
{
    int gdriver=DETECT, gmode, error, x, y, r;
    initgraph(&gdriver, &gmode, "");

    cout<<"Enter radius of circle: ";
    cin>>r;

    cout<<"Enter co-ordinates of center(x and y): ";
    cin>>x>>y;
    drawcircle(x, y, r);
 getch();
    return 0;
}
```

Mechanism to Conduct Lab:

Lab Session will be communicated through Skype / Adobe Connect session. As in computer graphics all the programs are implemented through Dev C++. During lab session students programming question are incorporated either through direct answers or through some sort of tutorials that are already uploaded at VULMS.

For 64-bit windows install the following version of Dev-CPP.
https://vulms.vu.edu.pk/Courses/CS602/Downloads/Dev-Cpp%205.9.2%20TDM-GCC%204.8.1%20Setup.rar
For adding graphics library in 64-bit version of Dev-CPP see the link that illustrates the steps.
https://vulms.vu.edu.pk/Courses/CS602/Downloads/Adding%20graphics%20library%20in%20Dev%20CPP%20For%20Windows%2010%20Tutorial.docx

For 32-bit windows you can install the following version of Dev-CPP.
https://vulms.vu.edu.pk/Courses/CS602/Downloads/devcpp-4.9.9.2_setup.exe

In case you have 32 windows, you are required to follow the instruction as given in the following document.
https://vulms.vu.edu.pk/Courses/CS602/Downloads/Add%20graphics%20in%20Dev%20cpp.doc
Furthermore for 32-bit platform, you can download the graphics library from following link.
https://vulms.vu.edu.pk/Courses/CS602/Downloads/graphics%20library.zip

Lab 8

Write the C Program to implement polygon filling by using the flood fill algorithm.

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

// flood fill algorithm
void flood(int x, int y, int new_col, int old_col)
{
    // check current pixel is old_color or not
    if (getpixel(x, y) == old_col) {

        // put new pixel with new color
        putpixel(x, y, new_col);

        // recursive call for bottom pixel fill
        flood(x + 1, y, new_col, old_col);

        // recursive call for top pixel fill
        flood(x - 1, y, new_col, old_col);

        // recursive call for right pixel fill
        flood(x, y + 1, new_col, old_col);

        // recursive call for left pixel fill
        flood(x, y - 1, new_col, old_col);
    }
}

int main()
{
    int gd, gm = DETECT;

    // initialize graph
    initgraph(&gd, &gm, "");

    // rectangle coordinate
    int top, left, bottom, right;

    top = left = 50;
    bottom = right = 300;

    // rectangle for print rectangle
    rectangle(left, top, right, bottom);
```

```
    // filling start cordinate
    int x = 51;
    int y = 51;

    // new color to fill
    int newcolor = 12;

    // new color which you want to fill
    int oldcolor = 0;

    // call for fill rectangle
    flood(x, y, newcolor, oldcolor);
    getch();

    return 0;
}
```

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Lab 9
C++ program to draw circle and fill it by using Flood fill algorithm.

```
#include<iostream.h>
#include<graphics.h>
#include<dos.h>

void floodFill(int x,int y,int oldcolor,int newcolor)
{
   if(getpixel(x,y) == oldcolor)
   {
      putpixel(x,y,newcolor);
      floodFill(x+1,y,oldcolor,newcolor);
      floodFill(x,y+1,oldcolor,newcolor);
      floodFill(x-1,y,oldcolor,newcolor);
      floodFill(x,y-1,oldcolor,newcolor);
   }
}
//getpixel(x,y) gives the color of specified pixel

int main()
{
   int gm,gd=DETECT,radius;
   int x,y;

   cout<<"Enter x and y positions for circle\n";
   cin>>x>>y;
   cout<<"Enter radius of circle\n";
   cin>>radius;

   initgraph(&gd,&gm,"");
   circle(x,y,radius);
   floodFill(x,y,0,15);
   delay(5000);
   closegraph();

   return 0;
}
```

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