Graphics

1. **Briefly explain with parameters the purpose of the following functions in C:**
   a) `initgraph( )`   b) `outtextxy( )`   c) `floodfill( )`
   d) `setfillstyle( )`   e) `putpixel( )`   f) `line( )`
   g) `circle( )`

Ans:

`initgraph( ):`
purpose:
`initgraph( )` initializes the graphics system by loading a graphics driver from disk and putting the system into graphics mode.
Syntax:
>   `Void initgraph(int *gd, int *gm, char *path);`

`*gd` is an integer that specifies the graphics driver to be used. `*gm` is an integer that specifies the initial graphics mode.

`circle( ):`
purpose:
`circle( )` function is used to draw a circle with center `(x,y)` and third parameter specifies the radius of the circle.
Syntax:
>   `void circle(int x, int y, int radius);`

`line( ):`
purpose:
`line( )` function is used to draws a line between two specified points.
Syntax:
>   `Void line(int x1, int y1, int x2, int y2);`

`putpixel( ):`
purpose:
`putpixel( )` function is used to plots a pixel at a specified point in specified color.
Syntax:
>   `void putpixel(int x, int y, int color);`

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`floodfill( ):`
purpose:
`floodfill( )` function is used to flood fills the bounded region.
Syntax:

`void floodfill(int x, int y, int border);`

`outtextxy( ):`
purpose:
`outtextxy( )` function is used to displays a text or string at a specified point(x,y) on the screen.
Syntax:

`void outtextxy(int x, int y, char *string);`

`setfillstyle( ):`
purpose:
`setfillstyle( )` function sets the current fill pattern and fill color.
Syntax:

`void setfillstyle( int pattern, int color);`

`settextstyle( ):`
purpose:
`settextstyle( )` function sets the current fill pattern and fill color.
Syntax:

`void settextstyle( int font, int direction, int charsize);`

`closegraph( ):`
purpose:
Shuts down the graphics system and de-allocates all memory allocated by the graphics system.
Syntax:

`void closegraph( );`

`rectangle( ):`
purpose:
Draws a rectangle.
Syntax:

`void rectangle(int left, int top, int right, int bottom);`

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```
bar( ):
```
purpose:
Draws a two-dimensional bar.
Syntax:
```
      void bar (int left, int top, int right, int bottom);
```


2. How can you initiate graphics in C. Show with an example?

To initialize graphics mode we use `initgraph` function in our program. `initgraph` function is present in "`graphics.h`" header file, so your every graphics program should include "`graphics.h`" header file.

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

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

initgraph(&gd, &gm, "C:\\TC\\BGI");

getch();

closegraph();
}
```

This program initializes graphics mode and then closes it after a key is pressed. To begin with we have declared two variables of `int` type `gd` and `gm` for graphics driver and graphics mode respectively. `DETECT` is a macro defined in "`graphics.h`" header file, then we have passed three arguments to `initgraph` function to initialize graphics mode, first is the address of `gd`, second is the address of `gm` and third is the path where your BGI files are present. `getch` helps us to wait until a key is pressed, `closegraph` function closes the graphics mode.

3. Write a C program to draw a rectangle and fill it with color RED.
```
#include<graphics.h>

Void main(){
    int gd = DETECT,gm,left=100,top=100,right=200,bottom=200;

    initgraph(&gd, &gm, "C:\\TC\\BGI");

    setfillstyle(SOLID_FILL, RED);
    rectangle(left, top, right, bottom);

    closegraph();
}
```

4. Write a C program to draw a Circle and fill it with color Blue.

```c
#include<graphics.h>

Void main(){

    int gd = DETECT,gm, x= 300,y=150,radius=50;

    initgraph(&gd, &gm, "C:\\TC\\BGI");

    setfillstyle(SOLID_FILL, BLUE);
    circle(x, y, radius);

    closegraph();
}
```

Other Extra example:

```c
line(10, 150, 400, 450);
ellipse(300, 350, 0, 360, 100, 50);
outtextxy(100, 325, "My First C Graphics Program")
```

5. Write a program that draws a flag of Bangladesh.

```c
#include<graphics.h>

Void main(){

    int gd = DETECT,gm,left=100,top=100,right=200,bottom=200,
    x=150, y=150,radius=20;

    initgraph(&gd, &gm, "C:\\TC\\BGI");

    setfillstyle(SOLID_FILL, BLACK);
    rectangle(90, top, 100, bottom+30);

    setfillstyle(SOLID_FILL, GREEN);
    rectangle(left, top, right, bottom);

    setfillstyle(SOLID_FILL, RED);
    circle(x, y, radius);

    closegraph();
}
```