

Homework 4 - Solutions

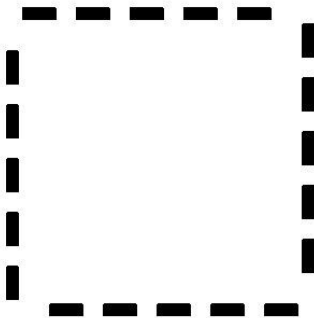
1.

```
#include<simplecpp>
main_program
{
    cout<<"Enter an alphabet";
    char c; cin>>c;
    switch(c)
    {
        case 'a':
        case 'A':
        case 'e':
        case 'E':
        case 'i':
        case 'I':
        case 'o':
        case 'O':
        case 'u':
        case 'U': cout << "It is a vowel"; break;
        default: cout << "It is a consonant";
    }
}
```

2.

- a. true
- b. true
- c. false
- d. true

3.



4.

- a. == is for checking condition, = is for assigning value
- b. $34\%5 > 1$ instead of $34\%5 >> 1$
- c. $(y==x)$ condition needs to be in bracket

5. 380 190

6. c

7.

- a. `c1.getY();`
- b. `i+100`
- c. `i+100`
- d. `j+100`
- e. `j+100`
- f. `j+100`
- g. `i`
- h. `i`
- k. `j`

8.

- a. Valid-It makes a rectangle of 100*500 and rotate it in angle of 100 radians.
- b. Invalid- because rotation is not allowed on Text
- c. Invalid- we can not put string in `textHeight()`;
- d. Valid- You are allowed to take -ve Y-coordinate, Compiler will not give any error.
But you can not see the complete circle, only small part visible to you.
- e. Invalid- There will be COLOR in place of color

9.

```
switch (account_type)
{
    case 1:
        interest = 2;
        break;
    case 2:
        interest = 3;
        break;
```

```

    case 3:
        interest = 4;
        break;
    case 4:
        interest = 5;
        break;
    case 5:
        interest = 6;
        break;
    default:
        interest = 7;
        break;
}

```

10. True, True, True

11. if (height ==180)

12. When three points are clicked on the canvas, the centroid of the triangle formed by these points is calculated. It is then marked with the letter G

13.

- a. 20 (it assign zero value to i,that is false for if condition)
- b. 5 (anything other than zero is treated as true)
- c. 5
- d. 20 (actual comparison here)
- e. 20
- f. 5
- g. 5
- h. 20
- i. 5 (same as d)
- j. Error (variable should be on left side of assignment operator)
- k. Error
- l. 5 (ASCII value of m get soresd)

14.

- a. $(a > b) \&\& a > c$
- b. $b > c$

15.

$b = 1$

16.

```
#include <simplecpp>
main_program{
    int year;
    cin >> year;
    if( year%4 != 0 || (year%100 == 0 && year%400 != 0) )
        cout << "not leap year";
    else
        cout << "not a leap year";
}
```

17.

- i) \sqrt{x} (Most efficient)
- ii) $x/2$ (Less efficient)
- iii) $x-2$ (Least)

18. C

19.

- 1) `canvas_width()`;
- 2) `canvas_height()`;
- 3) 0
- 4) 0
- 5) h or w (because both are equal here)
- 6) w or h (same as 5)
- 7) $(\sqrt{2 \cdot w \cdot h}) - w / 2$ [using pythagoras theorem]

20. (C):-

Code Snippet 1: If the value of variable 'weather' is 1, 'Grilled' will be printed; if it is 3, then 'Freezed' will be printed. for any other value apart from 1 and 3, the first code snippet will print 'Room Temperature'

Code Snippet 2: Only when the value of variable 'weather' is 2, the code snippet 2 will print 'Room Temperature' If value of variable 'weather' is less than or equal to 1, then 'Grilled' will be printed; if it is greater than or equal to 3, 'Freezed'.

21.

17

"Happy Birthday to you" is printed only when number2 is divisible by 6, so it gets printed at number2 = 12,18,24,30 i.e. 4 times. So it's not printed 17 times.

22.

Option A is printed if the number n is -1

Option B is printed if the number 'n' is 0. Note that in this case, the condition in the 'if' statement is not satisfied (since 0 is not < 0), so the program enters the 'else' block.

Option C cannot be printed because in both the 'if' and 'else' blocks, there is no 'break' statement after printing "how is your ". Therefore, after printing "how is your " and before printing "health?" either "parrot's " or "cat's " must be printed (fall-through in 'switch-case' statement without 'break'). Consequently, the string "so how is your health?" cannot be printed.

Option D can be printed if the number 'n' is -10. This is easy to see.

23.

Good Afternoon

The value of number1 is 1, so the first 'if' statement is always executed. Thus, 'Good ' is printed.

For the 2nd 'if' statement, the first condition is satisfied, but the second one is not. Hence, the overall condition of the 'if' statement is not satisfied. The control goes to the next statement.

For the 3rd 'if' statement, both the conditions are satisfied, and hence, 'Afternoon' is printed.

For the 4th 'if' statement, both the conditions are not satisfied, and hence, the control goes to the next statement.

Thus, the final output is: Good Afternoon.

24.

```
#include <simplecpp>
main_program{
    float a, b, c;
    cin>>a;
    cin>>b;
    cin>>c;
    float D = b*b - 4*a*c;
    if(D>=0){
        cout << (-b+sqrt(D))/2/a << endl;
        cout << (-b-sqrt(D))/2/a << endl;
    }
    else{
        cout << -b/2/a << "+" << sqrt(-D)/2/a << "i" << endl;
        cout << -b/2/a << "-" << sqrt(-D)/2/a << "i" << endl;
    }
}
```

25.

```
main_program{
    initCanvas("Centroid");
    long int p1 = getClick();
    long int p2 = getClick();
    long int p3 = getClick();
    int x1=p1/65536;
    int x2=p1/65536;
    int x3=p1/65536;
    int y1=p1%65536;
    int y2=p1%65536;
    int y3=p1%65536;
```

```
float a=sqrt((x1-x2)^2+(y1-y2)^2);
```

```
float b=sqrt((x2-x3)^2+(y2-y3)^2);
```

```
float c=sqrt((x3-x1)^2+(y3-y1)^2);
```

```
float lx=(a*x1+b*x2+c*x3)/(a+b+c);
```

```
float ly=(a*y1+b*y2+c*y3)/(a+b+c);
```

```
float r=.5*sqrt((b+c-a)*(c+a-b)(a+b-c)/(a+b+c));
```

```
Circle c1(lx,ly,r)
```

```
}
```