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Assignment – 3

Source Code

```
(1) #include <iostream>

#include <math.h>

using namespace std;

int main() {

    float a, b, c, D, x1, x2;

    cout << "---- Mencari akar-akar persamaan ----" << endl;

    cout << "a = "; cin >> a;

    cout << "b = "; cin >> b;

    cout << "c = "; cin >> c;

    cout << endl;

    cout << "Persamaan: " << a << "x^2 + " << b << "x + " << c << " = 0" << endl;

    D = b * b - (4 * a * c);

    cout << "Diskriminan = " << D << ", sehingga" << endl;

    if (D > 0) {

        x1 = (-b + sqrt(D)) / 2 * a;

        x2 = (-b - sqrt(D)) / 2 * a;

        cout << "Akar-akar bersifat riil dan beda" << endl;

        cout << "x1 = " << x1 << endl;

        cout << "x2 = " << x2 << endl;

    }

}
```

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```
    else if (D == 0) {  
  
         $x1 = x2 = -b / 2 * a;$   
  
        cout << "Akar-akar bersifat riil dan sama" << endl;  
  
        cout << "x1 = " << x1 << endl;  
  
        cout << "x2 = " << x2 << endl;  
  
    }  
  
    else if (D < 0) {  
  
         $x1 = -b / 2 * a + (\text{sqrt}(-D) / 2 * a);$   
  
         $x2 = -b / 2 * a - (\text{sqrt}(-D) / 2 * a);$   
  
        cout << "Akar-akar bersifat imajiner" << endl;  
  
        cout << "x1 = " << x1 << "i" << endl;  
  
        cout << "x2 = " << x2 << "i" << endl;  
  
    }  
  
    else {  
  
        cout << "Persamaan tidak valid" << endl;  
  
    }  
  
    cout << endl;  
  
    return 0;  
  
}
```

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(2) #include <iostream>

using namespace std;

int main() {

int tanggal, bulan;

cout << "---- Menentukan zodiak berdasarkan tanggal lahir ----" << endl;

cout << "Masukkan tanggal lahir dalam angka (tanggal bulan): ";

cin >> tanggal >> bulan;

cout << "Tanggal: " << tanggal << endl;

cout << "Bulan: " << bulan << endl;

cout << "Zodiak: ";

// // Aries 21 Maret s/d 19 April

if ((bulan == 3 && tanggal >= 21 && tanggal <= 31) ||

(bulan == 4 && tanggal >= 1 && tanggal <= 19)) {

cout << "Aries" << endl;

}

// Taurus 20 April s/d 20 Mei

else if ((bulan == 4 && tanggal >= 20 && tanggal <= 30) ||

(bulan == 5 && tanggal >= 1 && tanggal <= 20)) {

cout << "Taurus" << endl;

}

// Gemini 21 Mei s/d 20 Juni

else if ((bulan == 5 && tanggal >= 21 && tanggal <= 31) ||

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```
(bulan == 6 && tanggal >= 1 && tanggal <= 20)) {  
    cout << "Gemini" << endl;  
}  
  
// Cancer    21 Juni s/d 22 Juli  
  
else if ((bulan == 6 && tanggal >= 21 && tanggal <= 30) ||  
    (bulan == 7 && tanggal >= 1 && tanggal <= 22)) {  
    cout << "Cancer" << endl;  
}  
  
// Leo       23 Juli s/d 22 Agustus  
  
else if ((bulan == 7 && tanggal >= 23 && tanggal <= 31) ||  
    (bulan == 8 && tanggal >= 1 && tanggal <= 22)) {  
    cout << "Leo" << endl;  
}  
  
// Virgo     23 Agustus s/d 22 September  
  
else if ((bulan == 8 && tanggal >= 23 && tanggal <= 31) ||  
    (bulan == 9 && tanggal >= 1 && tanggal <= 22)) {  
    cout << "Virgo" << endl;  
}  
  
// Libra     23 September s/d 22 Oktober  
  
else if ((bulan == 9 && tanggal >= 23 && tanggal <= 30) ||  
    (bulan == 10 && tanggal >= 1 && tanggal <= 22)) {  
    cout << "Libra" << endl;  
}
```

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```
// Scorpio 23 Oktober s/d 21 November
```

```
else if ((bulan == 10 && tanggal >= 23 && tanggal <= 31) ||
```

```
(bulan == 11 && tanggal >= 1 && tanggal <= 21)) {
```

```
    cout << "Scorpio" << endl;
```

```
}
```

```
// Sagitarius 22 November s/d 21 Desember
```

```
else if ((bulan == 11 && tanggal >= 22 && tanggal <= 30) ||
```

```
(bulan == 12 && tanggal >= 1 && tanggal <= 21)) {
```

```
    cout << "Sagitarius" << endl;
```

```
}
```

```
// Capricorn 22 Desember s/d 19 Januari
```

```
else if ((bulan == 12 && tanggal >= 22 && tanggal <= 31) ||
```

```
(bulan == 1 && tanggal >= 1 && tanggal <= 19)) {
```

```
    cout << "Capricorn" << endl;
```

```
}
```

```
// Aquarius 20 Januari s/d 18 Februari
```

```
else if ((bulan == 1 && tanggal >= 20 && tanggal <= 31) ||
```

```
(bulan == 2 && tanggal >= 1 && tanggal <= 18)) {
```

```
    cout << "Aquarius" << endl;
```

```
}
```

```
// Pisces 19 Februari s/d 20 Maret
```

```
else if ((bulan == 2 && tanggal >= 19 && tanggal <= 29) ||
```

```
(bulan == 3 && tanggal >= 1 && tanggal <= 20)) {
```

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```
        cout << "Pisces" << endl;

    }

    else {

        cout << "tidak ditemukan" << endl;

    }

    cout << endl;

    return 0;

}
```

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(3) #include <iostream>

using namespace std;

int main() {

int bulan;

cout << "---- Menentukan jumlah hari dalam suatu bulan ----" << endl;

cout << "Masukkan bulan dalam angka (1-12): ";

cin >> bulan;

switch(bulan) {

case 1: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

case 2: cout << "Bulan " << bulan << ": 28/29 hari" << endl; break;

case 3: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

case 4: cout << "Bulan " << bulan << ": 30 hari" << endl; break;

case 5: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

case 6: cout << "Bulan " << bulan << ": 30 hari" << endl; break;

case 7: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

case 8: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

case 9: cout << "Bulan " << bulan << ": 30 hari" << endl; break;

case 10: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

case 11: cout << "Bulan " << bulan << ": 30 hari" << endl; break;

case 12: cout << "Bulan " << bulan << ": 31 hari" << endl; break;

default: cout << "Bulan " << bulan << ": tidak ditemukan" << endl; break;

}

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```
cout << endl;
```

```
return 0;
```

```
}
```


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(4) #include <iostream>

using namespace std;

int main() {

 long double bil;

 cout << "---- Menentukan jenis bilangan ----" << endl;

 cout << "Masukkan angka: ";

 cin >> bil;

 int n = (int) bil;

 if (bil == n) {

 cout << "Bilangan bulat" << endl;

 }

 else if (bil != n){

 cout << "Bukan bilangan bulat" << endl;

 }

 else {

 cout << "Bilangan tidak dapat dikenali" << endl;

 }

 cout << endl;

 return 0;

}

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Screenshot

The screenshot shows a Visual Studio Code window with a C++ file named `1persamaan.cpp`. The code implements a program to solve quadratic equations of the form $ax^2 + bx + c = 0$. It prompts the user to input coefficients a , b , and c , then calculates the discriminant $D = b^2 - 4ac$. Based on the value of D , it determines the nature of the roots: real and equal ($D = 0$), real and distinct ($D > 0$), or imaginary ($D < 0$). The terminal output shows three test cases: 1) $a=1, b=2, c=1$ resulting in $x_1 = -1, x_2 = -1$; 2) $a=1, b=-7, c=12$ resulting in $x_1 = 4, x_2 = 3$; 3) $a=1, b=1, c=1$ resulting in imaginary roots $x_1 = 0.366025i, x_2 = -1.366031i$.

```
#include <iostream>
#include <cmath>

using namespace std;

int main() {
    float a, b, c, D, x1, x2;

    cout << "---- Mencari akar-akar persamaan ----" << endl;
    cout << "a = "; cin >> a;
    cout << "b = "; cin >> b;
    cout << "c = "; cin >> c;

    cout << endl;
    cout << "Persamaan: " << a << "x^2 + " << b << "x + " << c << " = 0" << endl;

    D = b * b - (4 * a * c);

    cout << "Diskriminan = " << D << ", sehingga" << endl;

    if (D > 0) {
        x1 = (-b + sqrt(D)) / 2 * a;
        x2 = (-b - sqrt(D)) / 2 * a;
        cout << "Akar-akar bersifat riil dan beda" << endl;
        cout << "x1 = " << x1 << endl;
        cout << "x2 = " << x2 << endl;
    }
    else if (D == 0) {
        x1 = x2 = -b / 2 * a;
        cout << "Akar-akar bersifat riil dan sama" << endl;
        cout << "x1 = " << x1 << endl;
        cout << "x2 = " << x2 << endl;
    }
    else if (D < 0) {
        x1 = -b / 2 * a + (sqrt(-D)) / 2 * a;
        x2 = -b / 2 * a - (sqrt(-D)) / 2 * a;
        cout << "Akar-akar bersifat imajiner" << endl;
        cout << "x1 = " << x1 << "i" << endl;
        cout << "x2 = " << x2 << "i" << endl;
    }
    else {
        cout << "Persamaan tidak valid" << endl;
    }
}
```

The screenshot shows a Visual Studio Code window with a C++ file named `2zodiak.cpp`. The code implements a program to determine a zodiac sign based on a birth date (day and month). It prompts the user to input the day and month, then checks the date against predefined ranges for each zodiac sign: Aries (March 21 - April 19), Taurus (April 20 - May 20), Gemini (May 21 - June 20), Cancer (June 21 - July 22), Leo (July 23 - August 22), and Virgo (August 23 - September 22). The terminal output shows three test cases: 1) Date 17/8 resulting in Leo; 2) Date 24/10 resulting in Scorpio; 3) Date 18/3 resulting in Pisces.

```
#include <iostream>
using namespace std;

int main() {
    int tanggal, bulan;

    cout << "---- Menentukan zodiak berdasarkan tanggal lahir ----" << endl;
    cout << "Masukkan tanggal lahir dalam angka (tanggal bulan): ";

    cin >> tanggal >> bulan;

    cout << "Tanggal: " << tanggal << endl;
    cout << "Bulan: " << bulan << endl;
    cout << "Zodiak: ";

    // Aries 21 Maret s/d 19 April
    if ((bulan == 3 && tanggal >= 21 && tanggal <= 31) ||
        (bulan == 4 && tanggal >= 1 && tanggal <= 19)) {
        cout << "Aries" << endl;
    }
    // Taurus 20 April s/d 20 Mei
    else if ((bulan == 4 && tanggal >= 20 && tanggal <= 30) ||
        (bulan == 5 && tanggal >= 1 && tanggal <= 20)) {
        cout << "Taurus" << endl;
    }
    // Gemini 21 Mei s/d 20 Juni
    else if ((bulan == 5 && tanggal >= 21 && tanggal <= 31) ||
        (bulan == 6 && tanggal >= 1 && tanggal <= 20)) {
        cout << "Gemini" << endl;
    }
    // Cancer 21 Juni s/d 22 Juli
    else if ((bulan == 6 && tanggal >= 21 && tanggal <= 30) ||
        (bulan == 7 && tanggal >= 1 && tanggal <= 22)) {
        cout << "Cancer" << endl;
    }
    // Leo 23 Juli s/d 22 Agustus
    else if ((bulan == 7 && tanggal >= 23 && tanggal <= 31) ||
        (bulan == 8 && tanggal >= 1 && tanggal <= 22)) {
        cout << "Leo" << endl;
    }
    // Virgo 23 Agustus s/d 22 September
}
```

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[illegible]