Introduction (1A)

Please send corrections (or suggestions) to youngwlim@hotmail.com.

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Function

```
int     math    = 90;
int     science = 80;
int     history = 95;

float   mean    = 0.;


mean = maen (math, science, history);
```

```
float mean (int x, int y, int z)
{
    int     avg;

    avg = (x + y + z) / 3.0;

    return( avg );

}
```

Structure Type

```
struct name {
        int         math;
        short       science;
        char        history;
} ;
```

```
typedef struct name SType ;
```

```
SType John ;
SType Robert ;
```

```
John.math = 100;
John.sience = 95;
John.history = 80;

Robert.math = 97;
Robert.sience = 88;
Robert.history = 85;
```

```
mean(&John);
mean(&Robert);
```

John

```
math = 100;
sience = 95;
history = 80;
```

Robert

```
math = 97;
sience = 88;
history = 85;
```

```
mean(John.math, John.science, John.history);
mean(Robert.math, Robert.science, Robert.history);
```

Class Type

```
class CType {
        int         math;
        short       science;
        char        history;
        float       mean( );
} ;
```

```
CType   John ;
CType   Robert ;
```

```
John.math = 100;
John.sience = 95;
John.history = 80;

Robert.math = 97;
Robert.sience = 88;
Robert.history = 85;
```

Object John

```
math = 100;
sience = 95;
history = 80;
mean( )
```

Object Robert

```
math = 97;
sience = 88;
history = 85;
mean( )
```

```
John.mean( );     (100 + 95 + 80) / 3.0

Robert.mean( );   (97 + 88 + 85) / 3.0
```

Member Function

```
class CType {
        int         math;
        short       science;
        char        history;
        float       mean( );
} ;
```

```
float CType:: mean()
{
        float       avg;
        avg = (math + science + history) /3.;
        return (avg);
}
```

Object John

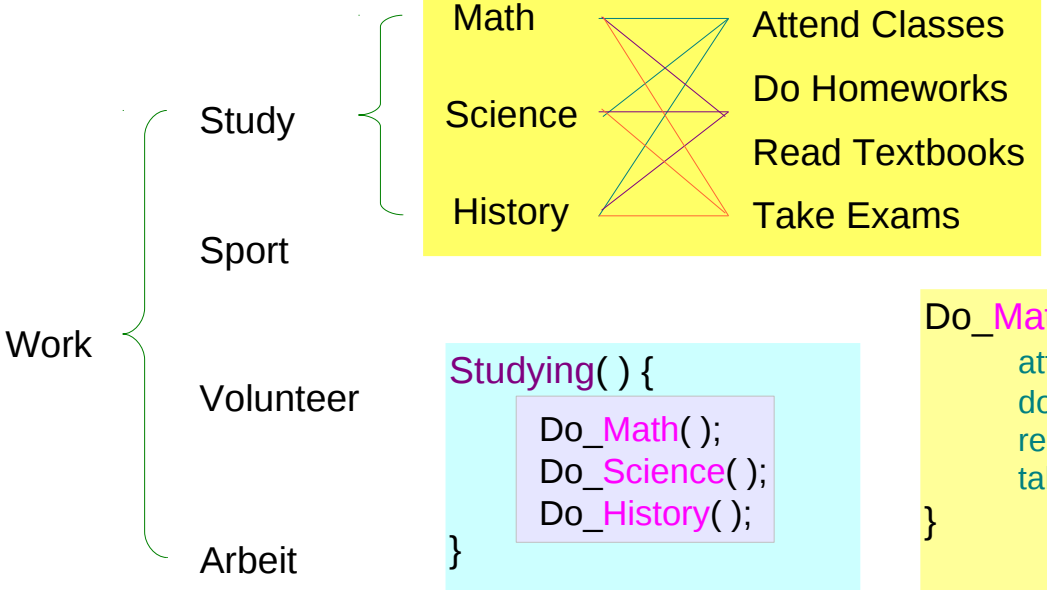
```
math = 100;
sience = 95;
history = 80;
mean( )
```

Object Robert

```
math = 97;
sience = 88;
history = 85;
mean( )
```

```
John.math = 100;
John.sience = 95;
John.history = 80;
John.mean( );

Robert.math = 97;
Robert.sience = 88;
Robert.history = 85;
Robert.mean( );
```

Divide a Work by Functions



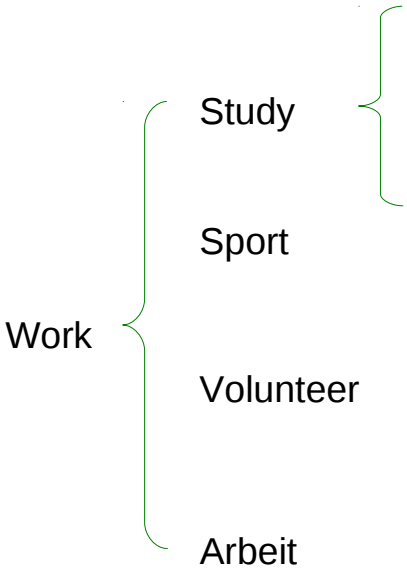

```
Working( ) {
        Studying( );
        Sporting( );
        Volunteering( );
        Arbeiting( );
}
```

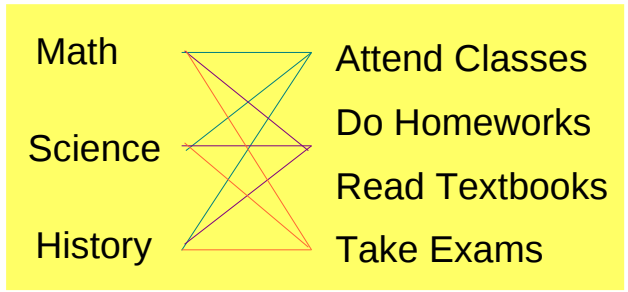
```
Studying( ) {
        Do_Math( );
        Do_Science( );
        Do_History( );
}

Sporting( ) {
   • • •
}

Volunteering( ) {
   • • •
}

Arbeiting( ) {
   • • •
}
```

```
Do_Math( ) {
        attendClasses(M, ...);
        doHomeworks(M, ...);
        readBooks(M, ...);
        takeExams(M, ...);
}

Do_Science( ) {
        attendClasses(S, ... );
        doHomeworks(S, ... );
        readBooks(S, ... );
        takeExams(S, ... );
}

Do_History( ) {
        attendClasses(H, ... );
        doHomeworks(H, ... );
        readBooks(H, ... );
        takeExams(H, ... );
}
```

```
attendClasses( ) {
   • • •
}

doHomeworks( ) {
   • • •
}

readBooks( ) {
   • • •
}

takeExams( ) {
   • • •
}
```

Group Data and Functions






```
Working( ) {
        Studying( );
        Sporting( );
        Volunteering( );
        Arbeiting( );
}
```

```
Studying( ) {
        SClass MObj;
        SClass SObj;
        SClass HObj
}

Sporting( ) {
   ● ● ●
}

Volunteering( ) {
   ● ● ●
}

Arbeiting( ) {
   ● ● ●
}
```

```
MObj.attendClasses();
MObj.doHomeworks();
MObj.readBooks();
MObj.takeExams();

SObj.attendClasses();
SObj.doHomeworks();
SObj.readBooks();
SObj.takeExams();

HObj.attendClasses();
HObj.doHomeworks();
HObj.readBooks();
HObj.takeExams();
```

Modular Programming

```
class SClass {
        Subject;
        attendClasses( );
        doHomeworks( );
        readBooks( );
        takeExams( );
};
```

MObj

- Subject=Math;
- attendClasses( );
- doHomeworks( );
- readBooks( );
- takeExams( );

SObj

- Subject=Science;
- attendClasses( );
- doHomeworks( );
- readBooks( );
- takeExams( );

HObj

- Subject=History;
- attendClasses( );
- doHomeworks( );
- readBooks( );
- takeExams( );

Class Structure

Class Structure

Class Structure

References

[1] W Savitch, “Absolute C++”
[2] P.S. Wang, “Standard C++ with objected-oriented programming”