C Plus Plus

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1 Keywords

A whole list of keywords can be found in https://en.cppreference.com/w/cpp/keyword

Keywords common to the C and C++				
A	D	F	R	T
01	asm	default	for	return	typedef
02	auto	do	goto	short	union
03	break	double	if	signed	unsigned
04	case	else	inline	sizeof	void
05	char	enum	int	static	volatile
06	const	extern	long	struct	while
07	continue	float	register	switch	

C++ exclusive keywords				
A	C	N	P	T
08	and	const_cast	namespace	protected	try
09	and_eq	delete	new	public	typeid
10	bitand	dynamic_cast	not	reinterpret_cast	typename
11	bitor	explicit	not_eq	static_cast	using
12	bool	export	operator	template	virtual
13	catch	false	or	this	wchar_t
14	class	friend	or_eq	throw	xor
15	compl	mutable	private	true	xor_eq

C++11 Keywords				
A	Ch	Co	N	S
16	alignas	char16_t	constexpr	noexcept	static_assert
17	alignof	char32_t	decltype	nullptr	thread_local

Table 1: Keywords in C++

2 Control Statements

C++ has 3 kind of control statements:(i) selection statementes, (ii) iteration statements and (iii) jump statements. It is said that most programs are formed by combining as many of these statements [1]. Each control statement can be modelled as an activity diagram using Unified Modelling Language (UML).

- selection statement: `if-else`, and `switch`.

- iteration statement or loops: `while`, `do-while`, `for`, `range-based` (special `for`).

- jump statements: `break`, `continue`, `return` and `goto`.

2.1 Selection statement

2.1.1 `if-else`


```
if (cond_1)
{
    //do smth
}
else
{
    //do smth else
    //else situation is not
    //shown in UML diagram
}
```
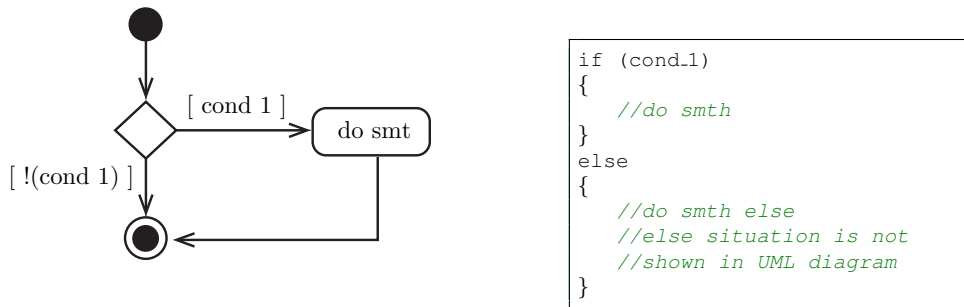
Figure 1: UML `if-else`
Activity Diagram Representation

2.1.2 `switch` Multiple-selection statement


```
//example
int grade{100};
switch (grade/10)
{
    case 9:
    case 10:
        //do smt-1
        break;

    case 8:
        //do smt-2
        break;

    case 7:
    default:
        //do-def
        break;
}
```
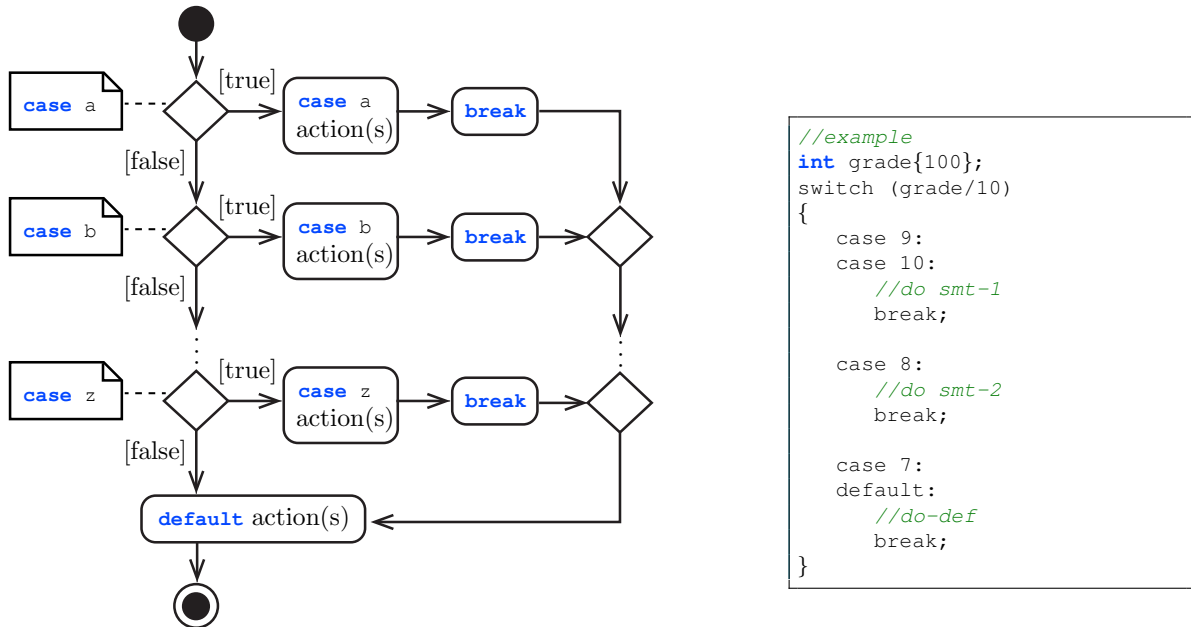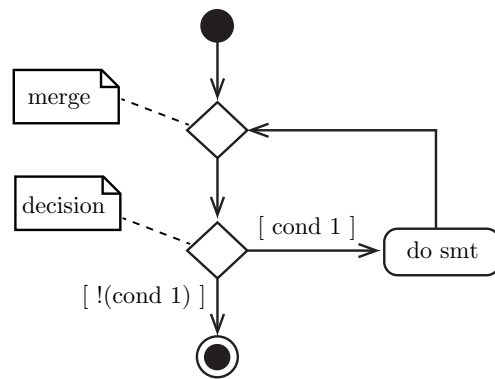
Figure 2: UML `switch`
Activity Diagram Representation

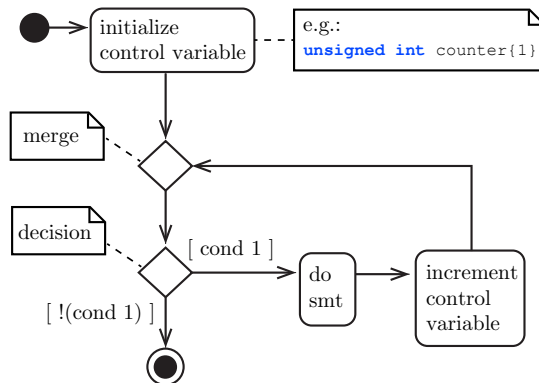## 2.2 Iteration statement

2.2.1 `while`-loop


```
while (cond_1)
{
    //do smth
}
```
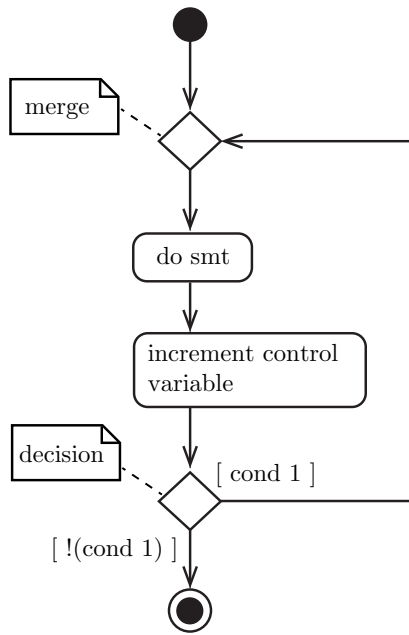
Figure 3: UML `while`
Activity Diagram Representation

2.2.2 `for`-loop


```
//examples
for (unsigned int i{10}; i >= 1; i--) {...}
for (unsigned int i{20}; i >= 2; i -= 2) {...}
```

Figure 4: UML `for`-loop
Activity Diagram Representation

2.2.3 do-while-loop

Figure 5: UML `do-while-loop` Activity Diagram Representation

```cpp
//example:
unsigned int counter{1}
do
{
    //do smt
    ++counter;
} while (counter < = 10)
```

3 Usefull Libraries

3.1 `<cmath>`

	Function	Description	Example
01	`ceil(x)`	rounds x to the smallest integer not less than x	`ceil(9.2)` $= 10.0$ `ceil(-9.8)` $= -9.0$
02	`cos(x)`	trigonometric cosine of x (x in radians)	`cos(0.0)` $= 1.0$
03	`exp(x)`	exponential function e^x	`exp(1.0)` $= 2.718282$
04	`fabs(x)`	absolute value of x	`fabs(5.1)` $= 5.1$ `fabs(0.0)` $= 0.0$ `fabs(-8.6)` $= 8.6$
05	`floor(x)`	rounds x to the largest integer not greater than x	`floor(9.2)` $= 9.0$ `floor(-9.8)` $= -10$
06	`fmod(x, y)`	remainder of x/y as a floating-point number	`fmod(2.6, 1.2)` $= 0.2$
07	`log(x)`	natural logarithm of x (base e)	`log()2.718282` $= 1.0$
08	`log10(x)`	logarithm of x (base 10)	`log10(10.0)` $= 1.0$ `log10(100.0)` $= 2.0$
09	`pow(x, y)`	x raised to power y, i.e. x^y	`pow(2.7)` $= 2^7 = 128$
10	`sin(x)`	trigonometric sine of x (x in radians)	`sin(0.0)` $= 0$
11	`sqrt(x)`	square root of x (where $x >= 0$)	`sin(9.0)` $= 3.0$
12	`tan(x)`	trigonometric tangent of x (x in radians)	`tan(0.0)` $= 0$

UML   Unified Modelling Language

References

[1] P. J. Deitel and H. M. Deitel, *C++ How to program.* Pearson Education, 2017.