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ECE 150 *Fundamentals of Programming*

Identifiers



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Outline

- In this presentation, we will:
 - Define identifiers and their purpose
 - Reviewing some of the identifiers we have already seen
 - Discussing case sensitivity
 - Describing naming conventions
 - Define
 - Reserved identifiers
 - Keywords



Identifiers

- Apart from literals, we have seen words that appear to refer to something, either an action or some other property:

`int main std cout endl return`

- A small subset are keywords
 - Part of the C++ programming language
- All others are *identifiers*
 - They are used to allow the programmer to refer to a specific means of storage or operations on data



Identifiers

- Each identifier can have a different significance

Identifier	Description
<code>int</code>	A keyword indicating a type, a standardized means of storing and manipulating data
<code>main</code>	The name of a function
<code>std</code>	A <i>namespace</i> ; specifically all identifiers in the standard library are within the <code>std</code> namespace and must be referred to using <code>std::</code> :
<code>cout</code>	An object (a data structure) in the standard library that allows printing to the console or standard output
<code>endl</code>	An object in the standard library that is used to indicate that we are at the end of a line and we should continue on the next
<code>return</code>	An keyword indication of the value to be returned from a function



Identifiers

- Any combination of underscores, letters and numbers where the first character is not a number can be used as an identifier
- Whitespace and other symbols cannot be used
- Identifiers are *case sensitive*, so the identifiers
 a0 and A0
are as different (to the compiler) as the identifiers
 Charles_Babbage and Ada_Countess_of_Lovelace
- Identifiers will be used to refer to data and to operations on data
 - At all times, we will try to use descriptive identifiers
 - What does the data represent?
 - What does the function do?



Naming conventions

- Often, identifiers, once a reasonable name has been chosen, will follow some sort of *naming convention*
 - We will use *snake-case*:
Linked_list is_sorted array_capacity
 - Programming languages like Java use *camel-case*:
LinkedList IsSorted arrayCapacity
 - Some use *juxtaposition*:
linkedlist issorted arraycapacity



Naming conventions

- There is a special place reserved for you in hell if you use just an underscore as an identifier...

```
#include <stdio.h>
main(int t,int __,char*a){return!0<t?t<3?main(-79,-13,a+main(-87,1-__,main(-86,0,a+
1)+a)):1,t<__?main(t+1,__,a):3,main(-94,-27+t,a)&&t==2?__<13?main(2,__,+1,"%s %d %d\n"
):9:16:t<0?t<-72?main(__,t,"@n'+,#'/*{ }w+/w#cdnr/+,{ }r/*de}+,/*{*+,/w{%+,/w#q#n+, \
/{l+,/n{n+,/+#n+,/#;#q#n+,/+k#;*+,/'r : 'd*'3,{ }w+K w'K:'+'e#';dq#'l q#'+d'K#!/+ \
k#;q# 'r}eKK#}w' r}eKK{nl}' /#;#q#n')({)#}w')({){nl}' /+#n';d}rw' i;# ) {nl]!/n{n#'; r{ \
#w' r nc{nl}' /#{l,+'K {rw' iK{;[{nl}]'/w#q#n'wk nw' iwk{KK{nl]!/w{% 'l##w# ' i; :{nl \
]}'/*{q# 'ld;r'}{nlwb!/*de}'c ; ;{nl}'-{ }rw]' /+,}## '*'#nc, ',#nw]' /+kd'+e}+;#'rdq#w! \
nr' / ' ) }+}{rl# '{n' ' )#}'+'}##(!!/"):t<-50?__==*a?putchar(31[a]):main(-65,__,a+1):
main((*a=='/')+t,__,a+1):0<t?main(2,2,"%s"): *a=='/' ||main(0,main(-61,*a,"!ek;dc i \
@bK'(q)-[w]*%n+r3#l,{ }:\nuwloca-0;m .vpbks,fxntdCeghiry"),a+1);}
```



Reserved identifiers

- Some identifiers are reserved for use by the compiler:
 - Never define an identifier starting with an underscore
`_name`
 - Never define an identifier with two adjacent underscores
`ECE__150`
- If you do use such reserved identifiers, your code
 - May work,
 - It may not, or
 - It will work now, but will stop working with the next compiler update



Keywords

- Some identifiers are reserved by the programming language to identify specific features within the language
 - These *keywords* can never be used for any other purpose whatsoever
 - We have seen two keywords: `int` and `return`
 - The identifier `main` is not a keyword
 - We've defined this function to do something rather boring...
- There are approximately 100 keywords in the C++ programming language
 - We will see about 30 of these throughout this course



Summary

- After this lesson, you now
 - Understand what an identifier is
 - Understand the concept of case sensitivity
 - Are aware that there are
 - Reserved identifiers, and
 - Keywords



References

- [1] Wikipedia,
https://en.wikipedia.org/wiki/Identifier#In_computer_languages
- [2] C++ reference
<https://en.cppreference.com/w/cpp/language/identifiers>



Acknowledgments

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Colophon

These slides were prepared using the Georgia typeface. Mathematical equations use Times New Roman, and source code is presented using Consolas.

The photographs of lilacs in bloom appearing on the title slide and accenting the top of each other slide were taken at the Royal Botanical Gardens on May 27, 2018 by Douglas Wilhelm Harder. Please see

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for more information.





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