

Index

- (negation) operator in constant expressions 127
 - operator (subtraction, set difference) in constant expressions 130
 operator in constant expressions 30, 131
 or != operator 330

Symbols

31, 130, 131, 330
 ^ operator in constant expressions 31, 131
 ! (not operator) in constant expressions 30, 126
 !(boolean_expression) operator 329, 332
 != operator in constant expressions 131
 !memory operator 329
 !register operator 329
 ? command-line option 87
 @ command-line option 86
 @@ command-line option 86
 @a 331
 @abs function 261
 @addofs1st function 277
 @ae 331
 @align 186
 @Align procedure option 172
 @alignstack 186
 @alignstack procedure option 172, 184, 185
 @arity function 275
 @b 331
 @baseptype function 273
 @basetype function 272
 @be 331
 @bound function 278
 @bound pseudo-variable 417
 @byte compile-time function 261
 @byte function 262
 @c 331
 @Cdecl procedure option 346
 @cdecl procedure option 172, 173
 @ceil function 262

@char compile-time function 261
 @class function 274
 @cos function 262
 @cset compile-time function 261
 @curdir function 277
 @curlex function 277
 @curobject function 277
 @cuoffset function 277
 @date function 262
 @defined function 275
 @delete function 265
 @dim function 275
 @display 185
 @display procedure option 172, 184, 185
 @dword compile-time function 261
 @e 331
 @elements function 275
 @elementsizes function 274
 @enter 186
 @enter procedure option 174
 @enumsize function 278
 @env function 262
 @EOS function 271
 @errorprefix pseudo variable 277
 @eval function 258
 @exactlynChar function 268
 @exactlynCset function 267
 @exactlynChar function 269
 @exactlyntomChar function 269
 @exactlyntomCset function 267
 @exactlyntomiChar function 269
 @exceptions function 278
 @exp function 262
 @External option (in variable declarations) 33
 @External procedures 183
 @extract function 262
 @firstnChar function 268
 @firstnCset function 267
 @firstniChar function 269
 @floor function 263
 @FORWARD declarations 184
 @frame 186
 @g 331
 @ge 331

@index function 265
@insert function 265
@int8/@int16/@int32/@int64/@int128 compile-time functions 261
@into function 278
@isalpha function 263
@isalphanum function 263
@isclass function 276
@isconst function 276
@isdigit function 263
@IsExternal function 275
@isfreq function 276
@islower function 263
@ismem function 276
@isreg function 276
@isreg16 function 276
@isreg32 function 276
@isreg8 function 276
@isspace function 263
@istype function 276
@isupper function 263
@isxdigit function 263
@l 331
@lastobject function 277
@le 331
@leave 186
@leave procedure option 174
@length function 265
@lex function 274
@linenumber function 259, 276, 277
@localoffset function 277, 278
@locals function 275
@log function 263
@log10 function 263
@lowercase function 265
@lword compile-time function 261
@match compile-time function 282, 296
@match2 compile-time function 296
@matchChar compile-time function 285
@matchID function 270
@matchIntConst function 270
@matchiStr function 269
@matchNumericConst function 270
@matchRealConst function 270
@matchStr function 269
@matchStrConst function 271
@matchToiStr function 270
@matchToStr function 270
@max function 263
@min function 263
@minparmsize function 278
@na 331
@nae 331
@name function 272
@nb 331
@nbe 331
@nc 331
@ne 331
@nge 331
@nl 331
@nle 331
@no 331
@noalignstack 186
@noalignstack procedure option 172
@nodisplay 185
@Nodisplay option 221
@nodisplay procedure option 172
@noenter 186
@noenter procedure option 174, 184, 185
@noframe 186
@noframe procedure option 172
@noleave 186
@noleave procedure option 174, 184, 185
@nOrLessChar function 268
@nOrLessCset function 267
@nOrLessiChar function 269
@nOrMoreChar function 269
@nOrMoreCset function 267
@nOrMoreiChar function 269
@NOSTORAGE 33
@ns 331
@ntomChar function 269
@ntomCset function 267
@ntomiChar function 269
@nz 331
@o, 331
@odd function 263
@offset function 274

@oneChar compile-time function 285
 @oneChar function 268
 @oneCset function 266
 @oneiChar function 269
 @oneOrMoreChar function 268
 @oneOrMoreCset function 267
 @oneOrMoreiChar function 269
 @oneOrMoreWS function 271
 @optstring function 279
 @parmoffset function 277
 @Pascal procedure option 346
 @pascal procedure option 172, 173
 @pclass function 275
 @peekChar function 268
 @peekCset function 266
 @peekiChar function 269
 @peekWS function 271
 @ptype function 272
 @qword compile-time function 261
 @random function 263
 @randomize function 264
 @read compile-time function 302
 @real32/@real64/@real80 compile-time functions 261
 @REG function 271, 272
 @REG32 function 272
 @REG8 function 271
 @Returns procedure option 172, 346
 @returns procedure option 173
 @rindex function 265
 @s 331
 @section function 280
 @sin function 264
 @size function 274
 @sort function 264
 @sqrt function 264
 @staticname function 274
 @Stdcall procedure option 346
 @stdcall procedure option 172, 173
 @strbrk function 265
 @string operator 280
 @string compile-time function 261
 @strset function 265
 @strspan function 265
 @substr function 265
 @tan function 264
 @text function 280
 @text operator 250
 @time function 264
 @tokenize function 265
 @tostring operator 280
 @tostring operator 257
 @trace function 279
 @trim function 266
 @type function 272
 @typename function 272
 @uns8/@uns16/@uns32/@uns64/ @uns128 compile-time functions 261
 @uppercase function 266
 @uptoChar function 268
 @uptoCset function 266
 @uptoiChar function 269
 @uptoIstr function 270
 @uptoStr function 270
 @use procedure option 173
 @use reg32 procedure option 172
 @word compile-time function 261
 @WSorEOS function 271
 @WSthenEOS function 271
 @z 331
 @zeroOrMoreChar function 268
 @zeroOrMoreCset function 267
 @zeroOrMoreiChar function 269
 @zeroOrMoreWS function 271
 @zeroOrOneChar function 268
 @zeroOrOneCset function 266
 @zeroOrOneiChar function 269
 * (multiplication) operator in constant expressions 128
 *NIX 54
 / (division) operator in constant expressions 129
 & operator in constant expressions 31, 131
 && operator 329, 332
 #(...)# in macro parameters 250
 #{ ... }# sequence for manually passing parameters 215
 #...# parameter quoting mechanism

198
 #{}# sequence (to create thunks) 213
 #{}#" code brackets in boolean expressions 333
 #append 301
 #asm..#endasm directives 299
 #closeread compile-time statement 302
 #closewrite statement 301
 #else clause 36, 303
 #elseif clause in #if statement 36, 303
 #emit directive 299
 #endif clause 36, 303
 #endwhile 150
 #ERROR directive 301
 #for..#endfor statement 303
 #if statement 35, 302
 #Include directive 35, 245, 246
 #include directive 347
 #IncludeOnce directive 247
 #KEYWORD reserved word 252
 #linker directive 246
 #match..#endmatch 298
 #openread compile-time statement 302
 #openwrite statement 301
 #PRINT directive 301
 #regex..#endregex statement 283
 #return clause 283
 #system directive 300
 #TERMINATOR keyword 252
 #text..#endtext statement 281
 #while 150
 #while..#endwhile statement 303
 #write statement 301
 + (addition, set union, string concatenation) operator in constant expressions 130
 = operator in constant expressions 30, 131
 = or == operator 330
 == operator in constant expressions 131
 > operator 330
 > operator in constant expressions 31, 131
 >= operator 330
 >= operator in constant expressions 31, 131
 >> operator (shift right) in constant expressions 130
 | operator in constant expressions 31, 131
 || operator 329, 332
 Numerics
 80x86 instruction set 36, 397
 A
 aaa instruction 398
 aad instruction 398
 aam instruction 398
 aas instruction 398
 ABSTRACT keyword 232
 Abstract methods and abstract base classes 232
 Accessing fields of a structure 494
 Accessing the fields of a class 478
 Accessor methods 469
 Activation record 112
 adc instruction 36, 402
 add instruction 36, 402
 Addition operator (+) in constant expressions 130
 Address of a class procedure 239
 Address of a memory object (calculation) 410
 Address of a method 239
 Address of an iterator 239
 Address-of operator 239
 align directive 154
 align directive (in records) 108
 align procedure option 173
 Aligning fields within a record 497
 Allocating objects dynamically 488
 always exception handling clause 326
 and instruction 36, 402
 AND operator in boolean expressions 332
 Anonymous records 106
 Anonymous unions 107
 ANYEXCEPTION clause in the TRY..ENDTRY statement 325
 Arithmetic and logical instructions 36, 402

- Arithmetic instructions 38, 408
 Array constants 118
 Array data types 28, 105
 Arrays as structure fields 495
 Arrays of records 495
 Art of Assembly Language Programming 5, 7
 Assembler control compile-time functions 272
 Automatic code generation in procedures 186
- B**
- b
 name command-line option 86
 Back-end assembler command line parameters 86
 Back-end assemblers 59
 Backtracking 294
 Base classes 484
 begin..end block 337
 Big endian data format 42, 419
 Binary constants 29, 116, 151, 152, 153
 Binary object file output name (command-line option) 86
 Bit scan instructions 42, 419
 Bit test instructions 42, 419
 Bitwise type transfer functions 261
 Block-structured language 218
 Boolean constants 29, 117
 Boolean data type 102
 Boolean expressions for high-level language statements 329
 bound instruction 41, 416
 Branch out of range errors 415
 break and breakif statements 336
 bsf instruction 419
 bsr instruction 42, 419
 bswap instruction 42, 419
 bt instruction 42, 419
 btc instruction 42, 419
 btr instruction 42, 419
 bts instruction 42, 419
 Built-in types 151
 Byte data type 102
- C**
- c command-line option 86
 Call instruction 192
 call instruction 412
 Calling a class procedure 412
 Calling a procedure 39, 412
 Calling conventions 348
 Calling HLA Procedures 192
 Calling HLA procedures from another language 349
 Calling methods and class procedures 234
 Calling procedures written in a different language 349
 Cascading exceptions 327
 case clause in switch statement 339
 Case neutrality 27, 100, 347
 Case-insensitive character matching (compile-time function) 286
 cbw instruction 398
 cd 50
 CDecl procedure option 348
 cdq instruction 398
 Changing the Location of HLA 58
 char compile-time function 260
 Character constants 29, 117
 Character data type 102
 Character set constants 118
 Character set data type 102
 Character set union operator (+) in constant expressions 130
 Class data types 222
 Class Methods, Iterators, and Procedures 476
 Class procedure address 239
 Class procedures 235
 Classes 469
 clc instruction 398
 cld instruction 398
 cli instruction 398
 clts instruction 398
 cmc instruction 398
 cmova instruction 40, 415
 cmovae instruction 40, 415
 cmovb instruction 40, 415
 cmovbe instruction 40, 415

cmovc instruction 40, 415
cmove instruction 40, 415
cmovg instruction 40, 415
cmovge instruction 40, 415
cmovl instruction 40, 415
cmovle instruction 40, 415
cmovna instruction 40, 415
cmovnae instruction 40, 415
cmovnb instruction 40, 415
cmovnbe instruction 40, 415
cmovnc instruction 40, 415
cmovne instruction 40, 415
cmovng instruction 40, 415
cmovnge instruction 40, 415
cmovnl instruction 40, 415
cmovnle instruction 40, 415
cmovno instruction 40, 415
cmovnp instruction 40, 415
cmovns instruction 40, 415
cmovnz instruction 40, 415
cmovo instruction 40, 415
cmovp instruction 40, 415
cmovpe instruction 40, 415
cmovpo instruction 40, 415
cmovs instruction 40, 415
cmovz instruction 40, 415
cmp instruction 37, 404
cmpsb instruction 398
cmpsd instruction 398
cmpsw instruction 398
cmpxchg instruction 41, 417, 418
Command line parameters 86
Comments 26, 93
Comparison operators in constant expressions 131
Compile only (command-line option) 86
Compile-time "?" statement
 ? compile-time statement 146
Compile-time language 245
Compiling simple programs with HIDE 4
Composing instructions 397
Composite data types 28, 105
Computing the address of a memory operand 410
Conditional compilation statements 35,
 302
Conditional jump instructions 40, 415
Conditional move instructions 40, 415
Conditional set instructions 40, 415
Conjunction in boolean expressions 332
const declaration section 142
const keyword 142
Const sections 33
Constant expressions 30, 124
Constants
 array 118
 binary 29, 116
 boolean 29, 117
 character 29, 117
 character set 118
 decimal 29, 115
 display_ 182
 floating-point 29, 116
 hexadecimal 29, 115
 literal 29, 115
 numeric 29, 115
 parms 182
 pointer 30, 123
 record 119
 regular expression 123
 string 30, 117
 structured 30, 118
 Unicode character 117
 Unicode string 117
 union 120
Constructors 233, 487, 489
Context free macros 252
continue and continueif statements 336
Controlling field offsets within a record 496
Conversion functions (compile-time language) 260
cpuid instruction 398
Create procedure for an object 489
Creating a New Project in RadASM 41
Creating a Virtual Method Table 234
cset compile-time function 260
Cset data type 102, 152
Customizing HLA 57
cwd instruction 398
cwde instruction 398

D

- daa instruction 398
- das instruction 398
- Data Types 27, 102
- Data types
 - array 28, 105
 - composite 28
 - enumerated 103
 - pointer 111
 - record 28, 106
 - thunks 112
 - union 105
- dec instruction 38, 408
- Decimal constants 29, 115
- Declaration section in an HLA program 135
- Declarations 32
 - array 105
 - const 142
 - constants 33
 - enum 103
 - external procedure 183
 - forward procedure 184
 - label 135
 - macros 34
 - namespace 167
 - overloaded procedure, iterator, and method 177
 - proc 167
 - procedure 31, 171, 175
 - readonly 165
 - record 106
 - static 33, 160
 - storage 164
 - type 32, 150
 - union 105
 - var 153
- default clause in switch statement 339
- Default include file directory 86
- Deferred macro parameter expansion 258
- Defining symbols on the HLA command line 86
- dir 50
- Disjunction in boolean expressions 332
- Display (accessing non-local variables) 220
 - _display_array constant 182
 - _display_variable 183, 220
- Displaying messages during compilation 301
- div instruction 38, 406
- Div operator in constant expressions 129
- Divide instructions 38, 406
- Division operator in constant expressions 129
- Dot operator 494
- Dot operator (field name selection) 132
- Double precision shift instructions 38, 409
- DUP operator (array constants) 119
- Dword data type 102
- dxx command-line option 86
- dxx=yy command-line option 86
- Dynamic Object Allocation 488

E

- e name command-line option 86
- Eager evaluation of macro parameters 258
- Editing HLA source files within RadASM 55
- Effective address calculations 410
- ELF code generation for FreeBSD 87
- ELF code generation for Linux OS 87
- ELSE 328
- ELSEIF statement 328
- emms instruction 425
- endconst keyword 142
- ENDIF 328
- endlabel keyword 136
- endswitch clause in switch statement 339
- endval keyword 147
- endvar keyword 154
- enter instruction 41, 417
- enum 103
- Enumerated data types 102, 103
- Errors 301
- Exception handling in HLA 321

- Exception numbers 323
Executable output filename (command-line parameter) 86
exit and exitif statements 337, 338
EXIT statement 191
External compilation units 345
External declarations 345
External identifiers 27, 100, 101
External procedure declarations 183
External symbol names (non-HLA identifiers) 346
External symbols 27, 100
- F
- f2xm1 instruction 422
fabs instruction 422
fadd instruction 420
faddp instruction 420
FASM as back-end assembler (command-line option) 86
fasm command-line option 86
fbld instruction 420
fbstp instruction 420
fchs instruction 422
fclex instruction 423
FCMOVcc instructions 423
fcom instruction 422
fcomi instruction 423
fcomip instruction 423
fcomp instruction 422
fcompp instruction 422
fcos instruction 422
fdecstp instruction 423
fdiv instruction 421
fdivp instruction 421
fdivr instruction 421
fdivrp instruction 421
ffree instruction 423
fiadd instruction 421
ficom instruction 422
ficomp instruction 422
fidiv instruction 421
fidivr instruction 422
Field alignment within a record 497
Field Offsets Within a Record 496
fld instruction 420
fimul instruction 421
_finalize_string 240
Finalizers 240
fincstp instruction 423
finit instruction 422
fist instruction 420
fistp instruction 420
fld instruction 420
fld1 instruction 422
fldcw instruction 423
fldl2e instruction 422
fldl2t instruction 422
fldlg2 instruction 422
fldln2 instruction 422
fldpi instruction 422
fldz instruction 422
Floating point constants 116
Floating point instructions 42, 420
Floating-point constants 29
fmul instruction 420
fmulp instruction 421
fnop instruction 423
for..endfor statement 334
foreach..endfor statement 342
forever..endfor statement 336
FORWARD declarations 241
Forward procedure declarations 184
fpatan instruction 422
fprem instruction 422
fprem1 instruction 422
fptan instruction 422
frame procedure option 172, 184, 185
freebsd command-line option 87
FreeBSD OS ELF code generation 87
frndint instruction 422
fscale instruction 422
fsin instruction 422
fsincos instruction 422
fsqrt instruction 422
fst instruction 420
fstcw instruction 423
fstp instruction 420
fstsw instruction 423
fsub instruction 421
fsubp instruction 421
fsubr instruction 421

- fsubrp instruction 421
- ftst instruction 422
- fucom instruction 422
- fucomp instruction 422
- fucompp instruction 422
- Function overloading 348
- fwait instruction 423
- fxam instruction 422
- fxch instruction 420
- fxtract instruction 422
- fyl2x instruction 422
- fyl2xp1 instruction 422

- G**
- Gas 1
- Gas as back-end assembler (command-line option) 86
- gas command-line option 86
- gasx command-line option 86
- Generating a linker response file 86
- greedy evaluation 295

- H**
- Header files 347
- Hello World 49
- Hexadecimal constants 29, 115
- HIDE 1
 - auto completion 17
 - compiling simple programs 4
 - global settings 11
 - menus 4
 - project file format 18
 - project manager 14
 - project panel 3
 - settings 10
- High level language statements 321
- HLA command line options 86
- hla command-line option 87
- HLA Compile-Time Language 245
- HLA customization 57
- HLA Design Goals 5
- HLA environment variables 46
- HLA installation under Windows 45
- HLA Integrated Development Environment 1
- HLA internal operation 84

- I**
- i
 - path command-line option 86
- IDE 24
- Identifiers 27, 100
- idiv instruction 38, 406
- IF statement 328
- imod instruction 406
- imul instruction 37, 405
- in instruction 41, 416
- IN operator 331
- in operator 329, 331
- in operator in constant expressions 131
- IN reg parameter specification 171
- inc instruction 38, 408
- Include file directory 86
- Include files 35, 246
- Index operator (selecting an array element) 133
- Infinite loops 336
- Inheritance 473, 484
- Inherited fields in records 107
- Inheritance 228
- inherits keyword 107
- INHERITS keyword (classes) 473
- INHERITS reserved word 228
- _initialize_string 240
- Initializers 240

- Input and output instructions 41, 416
- insb instruction 398
- insd instruction 399
- Installation under Windows 45
- Installing HLA 45
 - Installing HLA under FreeBSD 54
 - Installing HLA under Linux 54
 - Installing HLA under Mac OSX 54
 - Installing RadASM 31
- Instances (of a class) 471
- Instruction composition 397
- insw instruction 399
- int instruction 41, 416
- Int128 data type 102
- Int16 data type 102
- Int32 data type 102
- Int64 data type 102
- Int8 data type 102
- int8/int16/int32/int64/int128 compile-time functions 260
- Integrated Development Environments 24
- Internal name of the HLA main program 86
- intmul instruction 37, 405
- into instruction 399
- invd instruction 399
- iret instruction 399
- iretd instruction 399
- Iterator address 239
- Iterator declarations (overloaded) 177
- Iterators 342

- J
 - ja instruction 40, 415
 - jae instruction 40, 415
 - jb instruction 40, 415
 - jbe instruction 40, 415
 - jc instruction 40, 415
 - jcxz instruction 40, 415
 - je instruction 40, 415
 - jecxz instruction 40, 415
 - jg instruction 40, 415
 - jge instruction 40, 415
 - jl instruction 40, 415
 - jle instruction 40, 415

- jmp instruction 40, 414
- jna instruction 40, 415
- jnae instruction 40, 415
- jnb instruction 40, 415
- jnbe instruction 40, 415
- jnc instruction 40, 415
- jne instruction 40, 415
- jng instruction 40, 415
- jnge instruction 40, 415
- jnl instruction 40, 415
- jnle instruction 40, 415
- jno instruction 40, 415
- jnp instruction 40, 415
- jns instruction 40, 415
- jnz instruction 40, 415
- jo instruction 40, 415
- jp instruction 40, 415
- jpe instruction 40, 415
- jpo instruction 40, 415
- js instruction 40, 415
- JT and JF medium level statements 341
- jz instruction 40, 415

- K
 - Kleene Plus 284
 - Kleene Star 284

- L
 - label declaration section 135
 - label keyword 135
 - lahf instruction 399
 - Lazy (pass by lazy evaluation) parameter option 171
 - Lazy versus greedy evaluation 295
 - Lazy evaluation parameters 213
 - lea instruction 39, 410
 - leave instruction 399, 417
 - level=h command-line option 87
 - level=l command-line option 87
 - level=m command-line option 87
 - level=v command-line option 87
 - Lex level 219
 - Lexical analysis 309
 - Lexical Scope 218
 - lib
 - path command-line option 86

- license command-line option 86
- Linker command-line parameters 86
- Linker response file 86
- Linking HLA code with other languages 347
- linux command-line option 87
- Linux OS ELF code generation 87
- Literal constants 29, 115
- Literal record constants 494
- Little endian data format 42, 419
- Local symbols in macros 34, 249
- Local symbols in multi-part macros 255
- lodsb instruction 399
- lodsd instruction 399
- lodsw instruction 399
- Logical AND operator in constant expressions 131
- Logical instructions 36, 38, 402, 408
- Logical OR operator in constant expressions 131
- Logical XOR operation in constant expressions 131
- Lookahead 292
- loop instruction 40, 415
- loope instruction 40, 415
- loopn instruction 40, 415
- loopz instruction 40, 415
- LWord data type 102
- lxxxxx command-line option 86

- M
- m command-line option 86
- Mac OSX/Mach-o code generation 87
- Mach-o code generation for Mac OS X 87
- macos command-line option 87
- Macro invocations 256
- Macro parameters 256, 257
- Macros 34, 248
- Macros as compile-time functions 305
- main
 - name command-line option 86
- Make files in RadASM 25
- Make menu in RadASM 79
- Mangled names 347
- Map files 86

- MASM 1
- MASM as back-end assembler (command-line option) 87
- masm command-line option 87
- Memory addressing modes 42, 390
- Method address 239
- Method declarations (overloaded) 177
- Methods 235, 469
- mkdir 50
- MMX instructions 42, 423
- mod instruction 406
- MOD operator (remainder) in constant expressions 129
- mov instruction 36, 402
- movd instruction 424
- movq instruction 425
- movsb instruction 399
- movsd instruction 399
- movsw instruction 399
- movsx instruction 39, 411
- movzx instruction 39, 411
- mul instruction 37, 404
- Multidimensional arrays 28, 105
- Multi-part macros 252
- Multiplication operator (*) in constant expressions 128
- Multiply instructions 37, 404

- N
- Name (pass by name) parameter option 171
- Name mangling 347
- Name parameters 213
- namespace declaration section 167
- Naming conventions 347
- NASM 1
- NASM as back-end assembler (command-line option) 87
- nasm command-line option 87
- neg instruction 38, 408
- Negated String Matching 287
- Negation operator in constant expressions 127
- Nesting record definitions 496
- New style procedure declarations 175
- Non-object calls of class procedures 236

- nop instruction 399
- not in operator 329, 331
- not instruction 38, 408
- Not operator (constant expressions) 30, 126
- Null operand instructions 36
- Number data types 103
- Numeric constants 29, 115
- Numeric data types 103
- Numeric Set Constants 116

- O
- obj
 - path command-line option 86
- Object file placement during compilation (command-line option) 86
- Object Initialization 487
- Object-oriented programming 222
- Objects 471
- operator in constant expressions 133
- OR operator in boolean expressions 332
- Ordinal data types 103
- out instruction 41, 416
- outsb instruction 399
- outsd instruction 399
- outsw instruction 399
- overload macro 177
- Overloaded procedure declarations 177
- overloads keyword 177
- OVERRIDE keyword 229
- overrides keyword 108
- Overriding a method 473
- Overriding precedence in constant expressions 132

- P
- p
 - path command-line option 86
- packssdw instruction 424
- packsswbv 424
- packuswb instruction 424
- paddb instruction 423
- paddir instruction 423
- Padding a record to some number of bytes 498
- paddsbt instruction 423
- paddsw instruction 423
- paddusb instruction 423
- paddusw instruction 423
- paddw instruction 423
- pand instruction 424
- pandn instruction 424
- Parameters 191
- Parameters passed on the stack 348
- Parenthesis in macro parameters 35, 250
- _parms_ constant 182
- Pass by lazy evaluation 213
- Pass by name parameters 213
- Pass by reference 203
- Pass by result parameters 203
- Pass by value 193
- Pass by value/result 203
- Passing by value
 - Byte-Sized Parameters 194
- Passing byte value
 - Double-word-sized parameters 200
 - Large parameters 202
 - Lword-sized parameters 201
 - Quad-word-sized parameters 200
 - Tbyte-sized parameters 201
 - Word-sized parameters 198
- Passing parameters in registers 171, 216
- Path specifications in RadASM 77
- pavgb instruction 424
- pavgw instruction 424
- pcmpeqb instruction 424
- pcmpeqd instruction 424
- pcmpeqw instruction 424
- pcmpgtb instruction 424
- pcmpgtd instruction 424
- pcmpgtw instruction 424
- PE/COFF object code generation 87
- pextrw instruction 424
- pinsrw instruction 424
- PL/360 I
- PL/M I
- pmaddwd instruction 424
- pmaxsw instruction 424
- pmaxub instruction 424
- pminsw instruction 424

- pminub instruction 424
 - pmovmskb instruction 424
 - pmulhuw instruction 424
 - pmulhw instruction 424
 - pmullw instruction 424
 - Pointer constants 30, 123
 - Pointer types 111
 - polymorphism 475
 - pop instruction 39, 411
 - popa instruction 399
 - popad instruction 399
 - popf instruction 399
 - popfd instruction 399
 - por instruction 424
 - Precompiling regular expressions 297
 - Primitive data types 27, 102
 - Private fields in a class 100
 - Private fieldsd in a class 471
 - proc declaration section 167
 - Procedure calls 39, 191, 412
 - Procedure declarations 31, 171
 - procedure declarations 175
 - Procedure declarations (overloaded) 177
 - Procedure options 185
 - Program Structure 31
 - Program structure 134
 - Project organization in RadASM 24
 - Project Panel in HIDE 3
 - Project types in RadASM 78
 - Prototype software 7
 - psadbw instruction 424
 - Pseudo-variables 277
 - pshufw instruction 424
 - pslld instruction 425
 - psllq instruction 425
 - psllw instruction 425
 - psrad instruction 425
 - psraw instruction 425
 - psrld instruction 425
 - psrlq instruction 425
 - psrlw instruction 425
 - psubb instruction 423
 - psubd instruction 424
 - psubsb instruction 424
 - psubsw instruction 424
 - psubusb instruction 424
 - psubusw instruction 424
 - psubw instruction 423
 - punpckhbw instruction 424
 - punpckhdq instruction 424
 - punpckhwd instruction 424
 - punpcklbw instruction 424
 - punpckldq instruction 424
 - punpcklwd instruction 424
 - push and pop instructions 39, 411
 - pusha instruction 399
 - pushad instruction 399
 - pushd instruction 39, 411
 - pushf instruction 399
 - pushfd instruction 399
 - pushw instruction 39, 411
 - _pVMT_ 233, 488
 - pxor instruction 424
- Q**
- QWord data type 102
- R**
- r
 - name command-line option 86
 - RadASM execution 31
 - RadASM installation 31
 - RadASM project management 32
 - RADASM.INI file 74
 - RadASM/HLA Integrated Development Environment 24
 - RAISE statement 321
 - raise statement 327
 - Range checking 41, 416
 - rcl instruction 38, 409
 - rcr instruction 409
 - rdmsr instruction 400
 - rdpmc instruction 400
 - rdtsc instruction 400
 - readonly declaration section 165
 - Real (Floating Point) Constants 29
 - Real constants 116
 - Real128 102
 - Real32 data type 102
 - real32/real64/real80 compile-time functions 260

Real64 data type 102
Real80 data type 102
Record constants 119, 494
Record data types 28, 106
Record field alignment 497
Record offsets 111, 496
Records as record fields 495
Recursive file inclusion (prevention) 247
Reference parameters 203
Register parameters 216
Regular expression constants 123
Regular expression macros 281
rep.insb instruction 400
rep.insd instruction 400
rep.insw instruction 400
rep.movsb instruction 400
rep.movsd instruction 400
rep.movsw instruction 400
rep.outsb instruction 400
rep.outsd instruction 400
rep.outsw instruction 400
rep.stosb instruction 400
rep.stosd instruction 400
rep.stosw instruction 400
repe.cmpsb instruction 400
repe.cmpsd instruction 400
repe.cmpsw instruction 400
repe.scasb instruction 401
repe.scasd instruction 401
repe.scasw instruction 401
repeat..until statement 334
repne.cmpsb instruction 401
repne.cmpsd instruction 401
repne.cmpsw instruction 401
repne.scasd instruction 401
repne.scasw instruction 401
Reraising an exception 327
Reserved words 27, 93
Result (pass by result) parameter option 171
Result parameters 203
ret instruction 40, 414
RET with NOFRAME option 189
RETURNS statement 397
returns statement 217

rol instruction 38, 409
ror instruction 409
Rotate instructions 38, 409
rsm instruction 401
Running HLA 49
Running RadASM 31

S

s command-line option 86
sahf instruction 401
sal instruction 38, 409
sar instruction 409
sbb instruction 36, 402
scasb instruction 401
scasd instruction 401
scasw instruction 401
Scoping rules 218
Selecting field names 132
Set intersection operator (*) in constant expressions 128
Set union operator (+) in constant expressions 130
seta instruction 40, 415
setae instruction 40, 415
setb instruction 40, 415
setbe instruction 40, 415
setc instruction 40, 415
sete instruction 40, 415
setg instruction 40, 415
setge instruction 40, 415
setl instruction 40, 415
setle instruction 40, 415
setna instruction 40, 415
setnae instruction 40, 415
setnb instruction 40, 415
setnbe instruction 40, 415
setnc instruction 40, 415
setne instruction 40, 415
setng instruction 40, 415
setnge instruction 40, 415
setnl instruction 40, 415
setnle instruction 40, 415
setno instruction 40, 415
setnp instruction 40, 415
setns instruction 40, 415
setnz instruction 40, 415

- seto instruction 40, 415
 - setp instruction 40, 415
 - setpe instruction 40, 415
 - setpo instruction 40, 415
 - sets instruction 40, 415
 - Setting auxiliary paths for HLA files 59
 - Setting default procedure options 185
 - sez instruction 40, 415
 - Sevag Krikorian 1
 - Shift and rotate instructions 38, 409
 - Shift left operator (130
 - Shift right operator (>>) in constant expressions 130
 - shl instruction 38, 409
 - shld instruction 409
 - shr instruction 409
 - shrd instruction 409
 - Sign and zero extension instructions 39, 411
 - Signed data types 103
 - Signed vs. unsigned comparisons in boolean expressions 330
 - source command-line option 86
 - Source file format output from HLA 86
 - Special symbols and punctuation 26, 93
 - Specifying an external symbols name 346
 - Static class fields 237
 - Static data objects in a class 472
 - static declaration section 160
 - Static member functions 235
 - Static Procedures (in a class) 474
 - Static section 33
 - stc instruction 402
 - std instruction 402
 - Stdcall procedure option 348
 - sti instruction 402
 - storage declaration section 164
 - stosb instruction 402
 - stosd instruction 402
 - stosw instruction 402
 - str.strRec definition 497
 - string compile-time function 260
 - String concatenation operator (+) in constant expressions 130
 - String Constants 30
 - String constants 117
 - String data type 102
 - String representation 497
 - String/Pattern matching compile-time function 266
 - Structure, accessing fields of... 494
 - Structured constants 30, 118
 - Structured goto statement 337
 - Structures as structure fields 495
 - sub instruction 36, 402
 - Subtraction operator (-) in constant expressions 130
 - super keyword 224
 - switch..case..default..endswitch statement 339
 - sym command-line option 87
 - Symbol related compile-time functions 272
 - Symbol table display 90
 - symbol table dump after compile (command-line option) 87
- T
- TASM 1
 - TASM as back-end assembler (command-line option) 87
 - tasm command-line option 87
 - TByte data type 102
 - Temporary working file directory (command-line option) 86
 - test command-line option 87
 - test instruction 36, 402
 - Text data type 103
 - THEN 328
 - THIS 478
 - This (reference to class object) 233
 - thread command-line option 86
 - Thread-safe code generation 86
 - THUNK constants (pass by name/lazy parameters) 213
 - Thunk data type 103
 - Thunks 112
 - try..always..endtry statement 326
 - TRY..EXCEPTION..ENDTRY statement 321

Type checking 124
 Type coercion 44, 125, 394
 Type compatibility 104
 type declaration section 150
 Type promotion 124
 Type sections 32

U

UCR Standard Library for 80x86 Programmers 5
 ud2 instruction 402
 Unicode Character Constants 117
 Unicode data type 102
 Unicode String Constants 117
 Union constants 120
 Union data types 105
 Units 345
 UNPROTECTED clause in the TRY..ENDTRY statement 324
 Uns128 data type 102
 Uns16 data type 102
 Uns32 data type 102
 Uns64 data type 102
 Uns8 data type 102
 Unsigned data types 103
 until clause in repeat..until statement 334
 Untyped reference parameters 172, 207, 208
 User-defined compilation errors 301
 User-defined exceptions 323

V

v command-line option 87
 Val (pass by value) parameter option 171
 val keyword 146
 Valres (pass by value/result) parameter option 171
 Value parameters 193
 Value/Result parameters 203
 Var (pass by reference) parameter option 171
 VAR (untyped reference parameters) 172
 var declaration section 153

var keyword 153
 Var type (untyped reference parameters) 208
 Variable parameter lists in macros 248
 vars constant 182
 Constants
 vars 182
 Verbose compile switch (command-line option) 87
 Virtual member functions 235
 Virtual method calls 475
 Virtual method table 481
 Virtual Method Table pointer 233
 Virtual Method Tables 482
 Virtual method tables 233
 Virtual Methods 474
 VMT 233, 483
 VMT 233, 481, 483

W

w command-line option 87
 wait instruction 402
 wbinvd instruction 402
 WChar data type 102
 Webster 7
 WHILE..ENDWHILE statement 333
 win32 command-line option 87
 Win32 OS PE/COFF object code generation 87
 Windows (GUI) applications 90
 Windows API external names 346
 Windows installation of HLA 45
 Windows Structured Exception Handler 323
 Word data type 102
 Working files directory (command-line option) 86

X

x
 name command-line option 86
 xadd instruction 42, 418
 XCHG instruction 37, 403
 xlat instruction 402
 xor instruction 36, 402

Y

Yield *112*

Z

Zero extension instruction *39, 411*
Zero operand instructions *36*
ZString data type *102*