Overview

Force.com Apex is a strongly-typed programming language that executes on the Force.com platform. Using Apex, you can add business logic to applications, write database triggers, and Visualforce controllers. Apex has a tight integration with the database and query language, web services, and email handling support. It also includes features such as asynchronous execution and support for testing.

Important Reserved Words

Keyword	Description	Example
abstract	Declares a class that contains abstract methods that only have their signature and no body defined. Can also define methods.	```public abstract class Foo {
protected void method1() { /*… */ }
abstract Integer abstractMethod();
}```
break	Exits the entire loop	```while(reader.hasNext()) {
if (reader.getEventType() == END) {
break;
};
// process
reader.next();```
catch	Identifies a block of code that can handle a particular type of exception	```try {
// Your code here
} catch (ListException e) {
// List Exception handling code here
}```
class	Defines a class	```private class Foo {
private Integer x;
public Integer getX() { return x; }
}```
continue	Skips to the next iteration of the loop	```while (checkBoolean) {
if (condition)
{continue; }
// do some work
}```
do	Defines a do-while loop that executes repeatedly while a Boolean condition remains true	```Integer count = 1;
do {
System.debug(count);
count++;
} while (count < 11);```
else	Defines the else portion of an if-else statement, that executes if the initial evaluation is untrue	```Integer x, sign;
if (x==0) {
sign = 0;
} else {
sign = 1;
}```
enum	Defines an enumeration type on a finite set of values	```public enum Season {WINTER, SPRING, SUMMER, FALL};
Season e = Season.WINTER;```
extends	Defines a class or interface that extends another class or interface	```public class MyException extends
   Exception {}

try {
   Integer i;
   if (i < 5) throw new MyException();
} catch (MyException e) {
   // Your MyException handling code
}``` |
| false | Identifies an untrue value assigned to a Boolean | ```Boolean isNotTrue = false;``` |

Important Reserved Words

Keyword	Description	Example
final	Defines constants and methods that can't be overridden	```public class myCls {
static final Integer INT_CONST;
}```
finally	Identifies a block of code that is guaranteed to execute	```try {
// Your code here
} catch (ListException e) {
// List Exception handling code
} finally {
// will execute with or without
// exception
}```
for	Defines a loop. The three types of for loops are: iteration using a variable, iteration over a list, and iteration over a query	```for (Integer i = 0, j = 0; i < 10;
i++) {   System.debug(i+1);
}

Integer[] myInts = new Integer[]{1, 8, 9};
for (Integer i : myInts) {
   System.debug(i);
}

String s = 'Acme';
for (Account a : [SELECT Id, Name,
FROM account
WHERE Name LIKE :(s+'%')]) {
   // Your code
}``` |
| global | Defines a class, method, or variable that can be used by any Apex that has access to the class, not just the Apex in the same application. | ```global class myClass {
  webService static void
  makeContact(String lastName) {
   // do some work
}``` |
| if | Defines a condition, used to determine whether a code block should be executed | ```Integer i = 1;
if (i > 0) {
  // do something;
}``` |
| implements | Declares a class or interface that implements an interface | ```global class CreateTaskEmailExample
implements Messaging.
InboundEmailHandler {
 global Messaging.InboundEmailResult
handleInboundEmail(Messaging.
inboundEmail email,
Messaging.InboundEnvelope env){
 // do some work, return value;
}

}``` |
| instanceOf | Verifies at runtime whether an object is actually an instance of a particular class | ```if (reports.get(0) instanceof
CustomReport) {
   // Can safely cast CustomReport
c = (CustomReport)
reports.get(0);
} else {
   // Do something with the non-
custom-report.
}``` |
| interface | Defines a data type with method signatures. Classes implement interfaces. An interface can extend another interface. | ```public interface PO {
   public void doWork();
}
public class MyPO implements PO {
   public override doWork() {
   // actual implementation
   }
}``` |

Important Reserved Words

Keyword	Description	Example
new	Creates a new object, sObject, or collection instance	```Foo f = new Foo();
MyObject__c mo =
new MyObject__c(Name= 'hello');
List<Account> la = new
List<Account>();```
null	Identifies a null constant that can be assigned to any variable	```Boolean b = null;```
override	Defines a method or property as overriding another defined as virtual in a class being extended or implemented	```public virtual class V {
  public virtual void foo()
{/*Does nothing*/}
}

public class RealV implements V {
  public override void foo() {
    // Do something real
    }
}``` |
| private | Defines a class, method, or variable that is only known locally, within the section of code in which it is defined. This is the default scope for all methods and variables that do not have a scope defined | ```public class OuterClass {
// Only visible to methods and
// statements within OuterClass
    private static final Integer
        MY_INT;
}``` |
| protected | Defines a method or variable that is visible to any inner classes in the defining Apex class | ```public class Foo {
  public void quiteVisible();
  protected void lessVisible();
}``` |
| public | Defines a method or variable that can be used by any Apex in this application or namespace | ```public class Foo {
  public void quiteVisible();
  private void almostInvisible();
}``` |
| return | Returns a value from a method | ```public Integer meaningOfLife() {
  return 42;
}``` |
| static | Defines a method or variable that is only initialized once, and is associated with an (outer) class, and initialization code | ```public class OuterClass {
  // Associated with instance
  public static final Integer
    MY_INT;

  // Initialization code
  static {
    MY_INT = 10;
  }
}``` |
| super | Invokes a constructor on a superclass | ```public class AnotherChildClass
extends InnerClass {
  AnotherChildClass(String s) {
    super();
    // different constructor, no
    // args
    }
}``` |
| testmethod | Defines a method as a unit test | ```static testmethod void testFoo() {
  // some test logic
}``` |
| this | Represents the current instance of a class, or in constructor chaining | ```public class Foo {
  public Foo(String s) { /* … */}
  public foo() {
    this('memes repeat'); }
}``` |
| throw | Throws an exception, signaling that an error has occurred | ```public class MyException extends
  Exception {}
try {
 Integer i;
 if (i < 5)
    throw new MyException();
} catch (MyException e) {
  // Your MyException handling
  // code here
}``` |
| transient | Declares instance variables that cannot be saved, and should not be transmitted as part of the view state, in Visualforce controllers and extensions | ```transient integer currentValue;``` |

Important Reserved Words

Keyword	Description	Example
trigger	Defines a trigger on an sObject	```trigger myAccountTrigger on Account
(before insert, before update) {
  if (Trigger.isBefore) {
    for (Account a : Trigger.old) {

      if (a.Name != 'okToDelete') {
        a.addError(
    'You can\'t delete this record!');
    }
  }
 }
}``` |
| true | Identifies a true value assigned to a Boolean | ```Boolean mustIterate = true;``` |
| try | Identifies a block of code in which an exception can occur | ```try {
  // Your code here

} catch (ListException e) {
  // List Exception handling code
  // here
}``` |
| webService | Defines a static method that is exposed as a Web service method that can be called by external client applications. Web service methods can only be defined in a global class. | ```global class MyWebService {
  webService static Id makeContact(
    String lastName, Account a) {

    Contact c = new Contact(
      LastName = 'Weissman',
      AccountId = a.Id);
    insert c;
    return c.Id;
  }
}``` |
| while | Executes a block of code repeatedly as long as a particular Boolean condition remains true | ```Integer count=1;
while (count < 11) {
  System.debug(count);
  count++;
}``` |
| with sharing | Enforces sharing rules that apply to the current user. If absent, code is run under default system context. | ```public with sharing class
sharingClass {
// Code will enforce current user's
// sharing rules
}``` |
| without sharing | Ensures that the sharing rules of the current user are not enforced | ```public without sharing class
noSharing {
// Code won't enforce current
user's
// sharing rules
}``` |
| virtual | Defines a class or method that allows extension and overrides. You can't override a method with the override keyword unless the class or method has been defined as virtual. | ```public virtual class MyException
extends Exception {
  // Exception class member
  // variable
  public Double d;

  // Exception class constructor
  MyException(Double d) {
    this.d = d;
  }

  // Exception class method
  protected void doIt() {}
}``` |

Annotations

Annotation	Description	Example
@future	Denotes methods that are executed asynchronously	```global class MyFutureClass {
@future
static void myMethod(
String a, Integer i) {
System.debug(
'Method called with: ' + a +
' and ' + i);
// do callout, other long
// running code
}
}```

Annotations

Annotation	Description	Example

@isTest	Denotes classes that only contain code used for testing your application. These classes don't count against the total amount of Apex used by your organization.	`@isTest` private class MyTest {
		// Methods for testing
		}

@isTest(OnInstall=true)	Denotes a test class or test method that executes on package installation	`@isTest(OnInstall=true)`
		private class TestClass {
		}

@isTest(SeeAllData=true)	Denotes a test class or test method that has access to all data in the organization including pre-existing data that the test didn't create. The default is false.	`@isTest(SeeAllData=true)`
		private class TestClass {
		}

@deprecated	Denotes methods, classes, exceptions, enums, interfaces, or variables that can no longer be referenced in subsequent releases of the managed package in which they reside	`@deprecated`
		public void limitedShelfLife() {
		}

@readOnly	Denotes methods that can perform queries unrestricted by the number of returned rows limit for a request	`@readOnly`
		private void doQuery() {
		}

@remoteAction	Denotes Apex controller methods that JavaScript code can call from a Visualforce page via JavaScript remoting. The method must be static and either public or global.	`@remoteAction`
		global static String getId(
		    String s) {
		}

@restResource	Denotes a class that is available as a REST resource. The class must be global. The urlMapping parameter is your resource's name and is relative to https://instance.salesforce.com/services/apexrest/.	`@restResource(urlMapping=`
		`'/Widget/*')`
		global with sharing class
		 MyResource() {
		}

@httpGet,
@httpPost,
@httpPatch,
@httpPut,
@httpDelete
	Denotes a REST method in a class annotated with @restResource that the runtime invokes when a client sends an HTTP GET, POST, PATCH, PUT, or DELETE respectively.
	
	The methods defined with any of these annotations must be global and static.
		`@httpGet`
		global static MyWidget__c
		doGet() {
		}
		
		`@httpPost`
		global static void doPost() {
		}
		
		`@httpDelete`
		global static void doDelete() {
		}

Primitive Types

Type	Description	Example
Blob	Binary data stored as a single object	`Blob` myBlob = `Blob`.valueof('idea');
Boolean	Value that can only be assigned true, false, or null	`Boolean` isWinner = true;
Date	Particular day	`Date` myDate = Date.today(); `Date` weekStart = myDate.toStartofWeek();

Datetime	Particular day and time	`Datetime` myDateTime =
		    Datetime.now();
		`Datetime` newd =
		    myDateTime. addMonths(2);

Primitive Types

Type	Description	Example
Decimal	Number that includes a decimal point. Decimal is an arbitrary precision number.	`Decimal` myDecimal = 12.4567; `Decimal` divDec = myDecimal. divide (7, 2, System.RoundingMode.UP); system.assertEquals(divDec, 1.78);
Double	64-bit number that includes a decimal point. Minimum value -2^{63}. Maximum value of 2^{63}-1	`Double` d=3.14159;
ID	18-character Force.com record identifier	`ID` id='00300000003T2PGAA0';
Integer	32-bit number that doesn't include a decimal point. Minimum value –2,147,483,648 — maximum value of 2,147,483,647	`Integer` i = 1;
Long	64-bit number that doesn't include a decimal point. Minimum value of -2^{63} — maximum value of 2^{63}-1.	`Long` l = 2147483648L;
String	Set of characters surrounded by single quotes	`String` s = 'repeating memes';
Time	Particular time	`Time` myTime = `Time`.newInstance(18, 30, 2, 20); Integer myMinutes = myTime. minute();

Collection Types

List	Ordered collection of typed primitives, sObjects, objects, or collections that are distinguished by their indices	`// Create an empty list of String`
		`List`<String> my_list = new
		`List`<String>();
		My_list.add('hi');
		String x = my_list.get(0);
		
		`// Create list of records from a query`
		`List`<Account> accs = [SELECT Id, Name FROM
		Account LIMIT 1000];

Map	Collection of key-value pairs where each unique key maps to a single value. Keys can be any primitive data type, while values can be a primitive, sObject, collection type, or an object.	`Map`<String, String> mys = new `Map`<String, String>(); `Map`<String, String> mys = new `Map`<String, String>{'a' => 'b', 'c' => 'd'. toUpperCase()}; Account myAcct = new Account(); `Map`<Integer, Account> m = new `Map`<Integer, Account>(); m.put(1, myAcct);
Set	Unordered collection that doesn't contain any duplicate elements.	`Set`<Integer> s = new `Set`<Integer>(); s.add(12); s.add(12); System.assert(s.size()==1);

Trigger Context Variables

Variable	Operators
isExecuting	Returns true if the current context for the Apex code is a trigger only
isInsert	Returns true if this trigger was fired due to an insert operation
isUpdate	Returns true if this trigger was fired due to an update operation
isDelete	Returns true if this trigger was fired due to a delete operation
isBefore	Returns true if this trigger was fired before any record was saved
isAfter	Returns true if this trigger was fired after all records were saved
isUndelete	Returns true if this trigger was fired after a record is recovered from the Recycle Bin
new	Returns a list of the new versions of the sObject records. (Only in insert and update triggers, and the records can only be modified in before triggers.)
newMap	A map of IDs to the new versions of the sObject records. (Only available in before update, after insert, and after update triggers.)
old	Returns a list of the old versions of the sObject records. (Only available in update and delete triggers.)

Trigger Context Variables

Variable	Operators
oldMap	A map of IDs to the old versions of the sObject records. (Only available in update and delete triggers.)
size	The total number of records in a trigger invocation, both old and new.

Apex Data Manipulation Language (DML) Operations

Keyword	Description	Example
insert	Adds one or more records	```Lead l = new Lead(Company='ABC', LastName='Smith'); insert l;```
delete	Deletes one or more records	```Account[] doomedAccts = [SELECT Id, Name FROM Account WHERE Name = 'DotCom']; try { delete doomedAccts; } catch (DmlException e) { // Process exception here }```
merge	Merges up to three records of the same type into one of the records, deleting the others, and re-parenting any related records	```List<Account> ls = new List<Account>{ new Account(Name='Acme Inc.'), new Account(Name='Acme')}; insert ls; Account masterAcct = [SELECT Id, Name FROM Account WHERE Name = 'Acme Inc.' LIMIT 1]; Account mergeAcct = [SELECT Id, Name FROM Account WHERE Name = 'Acme' LIMIT 1]; try { merge masterAcct mergeAcct; } catch (DmlException e) { }```
undelete	Restores one or more records from the Recycle Bin	```Account[] savedAccts = [SELECT Id, Name FROM Account WHERE Name = 'Trump' ALL ROWS]; try { undelete savedAccts; } catch (DmlException e) { }```
update	Modifies one or more existing records	```Account a = new Account(Name='Acme2'); insert(a); Account myAcct = [SELECT Id, Name, BillingCity FROM Account WHERE Name = 'Acme2' LIMIT 1]; myAcct.BillingCity = 'San Francisco'; try { update myAcct; } catch (DmlException e) { }```
upsert	Creates new records and updates existing records	```Account[] acctsList = [SELECT Id, Name, BillingCity FROM Account WHERE BillingCity = 'Bombay']; for (Account a : acctsList) {a.BillingCity = 'Mumbai';} Account newAcct = new Account(Name = 'Acme', BillingCity = 'San Francisco'); acctsList.add(newAcct); try { upsert acctsList; } catch (DmlException e) { }```

Standard Interfaces (Subset)

Database.Batchable
```
global (Database.QueryLocator | Iterable<sObject>)
  start(Database.BatchableContext bc) {}
global void execute(Database.BatchableContext BC, list<P>){}
global void finish(Database.BatchableContext BC){}
```

Schedulable
```
global void execute(ScheduleableContext SC) {}
```

Messaging.InboundEmailHandler
```
global Messaging.InboundEmailResult handleInboundEmail(Messaging.
inboundEmail email, Messaging.InboundEnvelope env){}
```

Comparable
```
global Integer compareTo(Object compareTo) {}
```

Standard Classes and Methods (Subset)

System
```
abortJob              assert                assertEquals
assertNotEquals       currentPageReference  currentTimeMillis
debug                 isRunningTest         now
process               resetPassword         runAs
schedule              setPassword           submit          today
```

Math
```
abs      acos     asin     atan     atan2    cbrt     ceil
cos      cosh     exp      floor    log      log10    max
min      mod      pow      random   rint     round    roundToLong
signum   sin      sinh     sqrt     tan      tanh
```

Describe
```
fields                fieldSets             getChildRelationships
getKeyPrefix          getLabel              getLabelPlural
getLocalName          getName               getRecordTypeInfos
getRecordTypeInfosByID                      getSobjectType
isAccessible          getRecordTypeInfosByName
isCreateable          isCustom              isCustomSetting
isDeletable           isDeprecatedAndHidden isFeedEnabled
isMergeable           isQueryable           isSearchable
isUndeletable         isUpdateable
Schema.RecordTypeInfo rtByName =  rtMapByName.get(rt.name);
Schema.DescribeSObjectResult d = Schema.SObjectType.Account;
```

DescribeFieldResult
```
getByteLength         getCalculatedFormula  getController
getDefaultValue       getDefaultValueFormula getDigits
getInlineHelpText     getLabel              getLength
getLocalName          getName               getPicklistValues
getPrecision          getReferenceTo        getRelationshipName
getRelationshipOrder  getScale              getSOAPType
getSObjectField       getType               isAccessible
isAutoNumber          isCalculated          isCaseSensitive
isCreateable          isCustom              isDefaultedOnCreate
isDependantPicklist   isDeprecatedAndHidden isExternalID
isFilterable          isGroupable           isHtmlFormatted
isIdLookup            isNameField           isNamePointing
isNillable            isPermissionable      isRestrictedDelete
isRestrictedPicklist  isSortable            isUnique
isUpdateable          isWriteRequiresMasterRead
Schema.DescribeFieldResult f = Schema.SObjectType.Account.fields.Name;
```

LoggingLevel
```
ERROR     WARN     INFO     DEBUG     FINE     FINER     FINEST

getAggregateQueries              getLimitAggregateQueries
getCallouts                      getLimitCallouts
getChildRelationshipsDescribes   getDMLRows
getLimitChildRelationshipsDescribes  getLimitDMLRows
getCPUTime                       getLimitCPUTime
getDMLRows                       getLimitDMLRows
getDMLStatements                 getLimitDMLStatements
getEmailInvocations              getLimitEmailInvocations
getFieldsDescribes               getLimitFieldsDescribes
getFindSimilarCalls              getLimitFindSimilarCalls
getFutureCalls                   getLimitFutureCalls
getHeapSize                      getLimitHeapSize
getPicklistDescribes             getLimitPicklistDescribes
getQueries                       getLimitQueries
getQueryLocatorRows              getLimitQueryLocatorRows
getQueryRows                     getLimitQueryRows
getRecordTypesDescribes          getLimitRecordTypesDescribes
getRunAs                         getLimitRunAs
getSavepointRollbacks            getLimitSavepointRollbacks
getSavepoints                    getLimitSavepoints
getScriptStatements              getLimitScriptStatements
getSoslQueries                   getLimitSoslQueries
```

UserInfo
```
getDefaultCurrency    getFirstName          getLanguage
getLastName           getLocale             getName
getOrganizationId     getOrganizationName   getProfileId
getSessionId          getUITheme            getUIThemeDisplayed
IsMultiCurrencyOrganization
String result = UserInfo.getLocale();
System.assertEquals('en_US', result);
```