One of the most common tasks facing web developers is validating user input. Relying on end-users for data is the most prone to errors. This is not because end-users have no idea what they are doing but rather, they are human and humans make mistakes. Perhaps they make a typo or they are not 100% sure what they are supposed to enter. Verifying the data entered is a critical step before submitting data to be processed. In the event there is a bug in the web application, it is that much more difficult to isolate the problem if the data being processed is not known to be correct. Validation must be performed at various levels but starting with the form data **before** it is submitted is the obvious first step.

Validation Details
The rule system foundation considers data to be either a number or a string.
Each data type has specific subtypes.

A number can be:
- integer
- float

A string can be:
- ip address
- domain/NetBIOS name
- address [ip address, domain name or NetBIOS name]
- email address
- credit card number

Each rule is an object in an array that defines the data type, form element name, validation function as well as subtype-specific properties.

Numeric Types

Integer / Float Properties
- rx: Name assigned to form element.
- dType: Data Type. This value must be num.
- subType: Numeric subtype. This value must be either int or float.
- rule: Function name to validate form element. This value must be isnum.
- nmin: Minimum value in range.
- nmax: Maximum value in range.
- oksingleton: Allow one other value "outside" specified range. This value must be either true or false
- mandatory: Determines if rule is applied to specified form element. This value may be true, false or may be another form element name. If a form element name is specified, the rule will only be applied if the form element exists and contains data.
- label: String identifier used in error messages displayed to end-user.
- Function returns true if value falls in specified range. This includes the minimum and maximum values of the range.

String Types

IP Address Properties

- rx: Name assigned to form element.
- dType: Data Type. This value must be **str**.
- subType: String subtype. This value must be **ip**.
- rule: Function name to validate form element. This value must be **isip**.
- bcastok: Accept broadcast IP address (###.###.###.255) as a valid IP address.
- mandatory: Determines if rule is applied to specified form element. This value may be **true**, **false** or may be another form element name. If a form element name is specified, the rule will only be applied if the form element exists and contains data.
- label: String identifier used in error messages displayed to end-user.
- Function returns **true** if the IP address is between 0.0.0.0 and 255.255.255.255 with the following exceptions:
  IP address starts with **0** and is not 0.0.0.0 :: return **false**
  IP address starts with **127** and is not 127.0.0.1 :: return **false**

Domain / NetBIOS Name Properties

- rx: Name assigned to form element.
- dType: Data Type. This value must be **str**.
- subType: String subtype. This value must be **domain**.
- rule: Function name to validate form element. This value must be **isdomain**.
- nameType: Type of name expected. This value must be **fqdn** or **netbios**.
- mandatory: Determines if rule is applied to specified form element. This value may be **true**, **false** or may be another form element name. If a form element name is specified, the rule will only be applied if the form element exists and contains data.
- label: String identifier used in error messages displayed to end-user.
- Function returns **true** if the specified value is a valid domain name or NetBIOS name.

Address Properties

- rx: Name assigned to form element.
- dType: Data Type. This value must be **str**.
- subType: String subtype. This value must be **addr**.
- rule: Function name to validate form element. This value must be **isaddr**.
- nameType: Type of name expected. This value must be **fqdn** or **netbios**.
- mandatory: Determines if rule is applied to specified form element. This value may be **true**, **false** or may be another form element name. If a form element name is specified, the rule will only be applied if the form element exists and contains data.
- label: String identifier used in error messages displayed to end-user.
- Function returns **true** if the specified value is a valid IP address, domain name or NetBIOS name.

Email Address Properties

- rx: Name assigned to form element.
- dType: Data Type. This value must be **str**.
- subType: String subtype. This value must be **eml**.
- rule: Function name to validate form element. This value must be **isemail**.
- mandatory: Determines if rule is applied to specified form element. This value may be **true**, **false** or may be another form element name. If a form element name is specified, the rule will only be applied if the form element exists and contains data.
- label: String identifier used in error messages displayed to end-user.
- Function returns **true** if the specified value is a valid email address. Location (part after the @ symbol) may be an IP address, domain name or NetBIOS name.

Credit Card Properties

- rx: Name assigned to form element.
- dType: Data Type. This value must be **str**.
- subType: String subtype. This value must be **cc**.
- rule: Function name to validate form element. This value must be **iscc**.
- ctype: Specific type of credit card expected or the name of the form element that contains the credit card type. This value may be **visa**(VISA), **mcrd**(MasterCard), **amex**(American Express), **dccb** (Diner's Club / Carte Blanche), **disc**(Discover) or **enrt**(enRoute).
- mandatory: Determines if rule is applied to specified form element. This value may be **true**, **false** or may be another form element name. If a form element name is specified, the rule will only be applied if the form element exists and contains data.
- label: String identifier used in error messages displayed to end-user.
- Function returns **true** if the specified value is a valid credit card number. The credit card prefix (beginning numbers) is tested against the specified type and the Luhn formula is applied.
- Test Credit Card Numbers (these are all fake numbers for testing purposes)

  4242424242424242 (VISA)
  4444333322221111 (VISA)
  4546389010000131 (VISA)
  4484033322221118 (VISA)

  5434609010000233 (MasterCard)
  5473000000000007 (MasterCard)
  5473000000000015 (MasterCard)
  5473000000000023 (MasterCard)

  343434343434343 (American Express)
  340000000000009 (American Express)
  343434343434350 (American Express)
  340000000000025 (American Express)

  30000000000004 (Diner's Club / Carte Blanche)
  6011000000000004 (Discover)
  201400000000009 (enRoute)

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