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<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Log file schema for SEng 462 at the University of Victoria.
    </xsd:documentation>
  </xsd:annotation>

  <xsd:element name="log" type="LogType"/>

  <!-- The log file created by the students consists of user commands, quote server
  hits, account changes, system events, error messages and debug messages -->
  <xsd:complexType name="LogType">
    <xsd:choice minOccurs="0" maxOccurs="unbounded">
      <xsd:element name="userCommand" type="UserCommandType"/>
      <xsd:element name="quoteServer" type="QuoteServerType"/>
      <xsd:element name="accountTransaction" type="AccountTransactionType"/>
      <xsd:element name="systemEvent" type="SystemEventType"/>
      <xsd:element name="errorEvent" type="ErrorEventType"/>
      <xsd:element name="debugEvent" type="DebugType"/>
    </xsd:choice>
  </xsd:complexType>

  <!-- User commands come from the user command files or from manual entries in
  the students' web forms -->
  <xsd:complexType name="UserCommandType">
    <xsd:all>
      <xsd:element name="timestamp" type="unixTimeLimits"/>
      <xsd:element name="server" type="xsd:string"/>
      <xsd:element name="transactionNum" type="xsd:positiveInteger"/>
      <xsd:element name="command" type="commandType"/>
      <xsd:element name="username" type="xsd:string" minOccurs="0"/>
      <xsd:element name="stockSymbol" type="stockSymbolType" minOccurs="0"/>
      <xsd:element name="filename" type="xsd:string" minOccurs="0"/>
      <xsd:element name="funds" type="xsd:decimal" minOccurs="0"/>
    </xsd:all>
  </xsd:complexType>

  <!-- Every hit to the quote server requires a log entry with the results. The
  price, symbol, username, timestamp and cryptokey are as returned by the quote server -->
  <xsd:complexType name="QuoteServerType">
    <xsd:all>
      <xsd:element name="timestamp" type="unixTimeLimits"/>
      <xsd:element name="server" type="xsd:string"/>
      <xsd:element name="transactionNum" type="xsd:positiveInteger"/>
      <xsd:element name="price" type="xsd:decimal"/>
      <xsd:element name="stockSymbol" type="stockSymbolType"/>
      <xsd:element name="username" type="xsd:string"/>
      <xsd:element name="quoteServerTime" type="xsd:integer"/>
      <xsd:element name="cryptokey" type="xsd:string"/>
    </xsd:all>
  </xsd:complexType>

  <!-- Any time a user's account is touched, an account message is printed.
  Appropriate actions are "add" or "remove". -->
  <xsd:complexType name="AccountTransactionType">
    <xsd:all>
      <xsd:element name="timestamp" type="unixTimeLimits"/>
      <xsd:element name="server" type="xsd:string"/>
      <xsd:element name="transactionNum" type="xsd:positiveInteger"/>

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    <xsd:element name="action" type="xsd:string"/>
    <xsd:element name="username" type="xsd:string"/>
    <xsd:element name="funds" type="xsd:decimal"/>
  </xsd:all>
</xsd:complexType>

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<!-- System events can be current user commands, interserver communications, or the execution of previously set triggers -->

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<xsd:complexType name="SystemEventType">
  <xsd:all>
    <xsd:element name="timestamp" type="unixTimeLimits"/>
    <xsd:element name="server" type="xsd:string"/>
    <xsd:element name="transactionNum" type="xsd:positiveInteger"/>
    <xsd:element name="command" type="commandType"/>
    <xsd:element name="username" type="xsd:string" minOccurs="0"/>
    <xsd:element name="stockSymbol" type="stockSymbolType" minOccurs="0"/>
    <xsd:element name="filename" type="xsd:string" minOccurs="0"/>
    <xsd:element name="funds" type="xsd:decimal" minOccurs="0"/>
  </xsd:all>
</xsd:complexType>

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<!-- Error messages contain all the information of user commands, in addition to an optional error message -->

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<xsd:complexType name="ErrorEventType">
  <xsd:all>
    <xsd:element name="timestamp" type="unixTimeLimits"/>
    <xsd:element name="server" type="xsd:string"/>
    <xsd:element name="transactionNum" type="xsd:positiveInteger"/>
    <xsd:element name="command" type="commandType"/>
    <xsd:element name="username" type="xsd:string" minOccurs="0"/>
    <xsd:element name="stockSymbol" type="stockSymbolType" minOccurs="0"/>
    <xsd:element name="filename" type="xsd:string" minOccurs="0"/>
    <xsd:element name="funds" type="xsd:decimal" minOccurs="0"/>
    <xsd:element name="errorMessage" type="xsd:string" minOccurs="0"/>
  </xsd:all>
</xsd:complexType>

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<!-- Debugging messages contain all the information of user commands, in addition to an optional debug message -->

```

<xsd:complexType name="DebugType">
  <xsd:all>
    <xsd:element name="timestamp" type="unixTimeLimits"/>
    <xsd:element name="server" type="xsd:string"/>
    <xsd:element name="transactionNum" type="xsd:positiveInteger"/>
    <xsd:element name="command" type="commandType"/>
    <xsd:element name="username" type="xsd:string" minOccurs="0"/>
    <xsd:element name="stockSymbol" type="stockSymbolType" minOccurs="0"/>
    <xsd:element name="filename" type="xsd:string" minOccurs="0"/>
    <xsd:element name="funds" type="xsd:decimal" minOccurs="0"/>
    <xsd:element name="debugMessage" type="xsd:string" minOccurs="0"/>
  </xsd:all>
</xsd:complexType>

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<!-- All Unix timestamps provided must be within the current semester -->

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<xsd:simpleType name="unixTimeLimits">
  <xsd:restriction base="xsd:integer">

    <xsd:minInclusive value="1514764800000"/> <!-- Jan 1, 2018-->
    <xsd:maxInclusive value="1525132800000"/> <!-- May 1, 2018 -->
  </xsd:restriction>

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</xsd:restriction>
</xsd:simpleType>

<!-- Stock symbols are always three or fewer letters long -->
<xsd:simpleType name="stockSymbolType">
  <xsd:restriction base="xsd:string">
    <xsd:maxLength value="3"/>
  </xsd:restriction>
</xsd:simpleType>

<!-- Enumeration of the very specific commands accepted in the system -->
<xsd:simpleType name="commandType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="ADD"/>
    <xsd:enumeration value="QUOTE"/>
    <xsd:enumeration value="BUY"/>
    <xsd:enumeration value="COMMIT_BUY"/>
    <xsd:enumeration value="CANCEL_BUY"/>
    <xsd:enumeration value="SELL"/>
    <xsd:enumeration value="COMMIT_SELL"/>
    <xsd:enumeration value="CANCEL_SELL"/>
    <xsd:enumeration value="SET_BUY_AMOUNT"/>
    <xsd:enumeration value="CANCEL_SET_BUY"/>
    <xsd:enumeration value="SET_BUY_TRIGGER"/>
    <xsd:enumeration value="SET_SELL_AMOUNT"/>
    <xsd:enumeration value="SET_SELL_TRIGGER"/>
    <xsd:enumeration value="CANCEL_SET_SELL"/>
    <xsd:enumeration value="DUMPLOG"/>
    <xsd:enumeration value="DISPLAY_SUMMARY"/>
  </xsd:restriction>
</xsd:simpleType>

</xsd:schema>
```