

PROJECT

Analyse software requirements

Vehicle Identification Number

Submitted by

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INTRODUCTION

This section includes purpose of and users of the program, and client requirements.

I. Purpose of the program

The program is developed to check and to validate Vehicle Identification Number (VIN), a 17-character unique identifying code used by automotive industries for each vehicle they manufacture. It also used to specify format and four sections of VIN, namely: world manufacturer identifier, vehicle description, check digit, and vehicle identification.

II. Users of the program

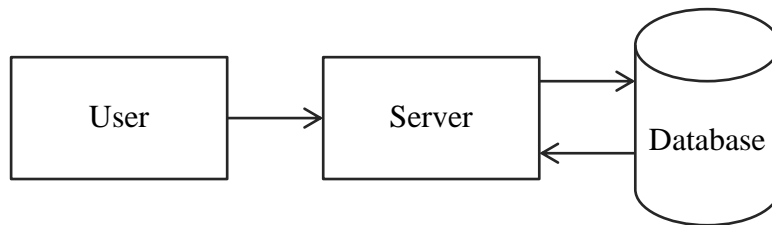
The validity of VIN is significant to specific group of people according to profession and businesses. The program will be released only in Western Australia and is designed for:

- automotive companies and organisation
 - to define vehicle has right components or parts are attached to it
 - to make sure VIN is valid before releasing it to car dealers and stakeholders
- car dealers
 - to identify they are to provide service for specific vehicle or for its parts
 - to use for recording purposes, such as service records and maintenance
- Department of Transport – Western Australia
 - to keep track of vehicle ownership for vehicle registration and licence
- Western Australia Police
 - to help authority determine if certain vehicle or its components are registered or a stolen one
 - to track ownership through transportation department
- possible car owners
 - to identify defective and branded vehicles before purchasing

III. Location of VIN information and system needs to be used

The system will be developed in object-oriented programming language, specifically, Java. The information regarding vehicle identification number can be stored and located in these ways:

- User can type in new VINs for registration purposes, making sure it is valid before storing it to the database.
- In every valid VIN entered, it will be stored in a database.
- The program will make use of searching function to locate for specific information. This function is limited to specific users and is discussed under non-functional requirements.



The system comes up with a program connected to a server-based network. Server is built for higher storage capacity, and will serve as a central storage for all VINs for Department of Transport (WA) and WA Police. The server opens one connection to the database and a TCP/IP port to listen to any incoming user connections. It also processes all the data and sends the information back to the users that are connected.

FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

This section includes application description, its functional and non-functional requirements and its processes.

I. Application requirements

The functional requirements are presented in the following table:

FUNCTIONAL REQUIREMENTS	
Methods	Details
Register new VIN	<ol style="list-style-type: none">1. A form will be displayed on the screen to type in new VIN.2. Information required is the VIN only.3. The application should validate the VIN entered.4. Once validated, data will be stored on to the database.5. Duplicate or multiple VINs shall not be accepted by the application.6. The program should automatically generate the sections or components of VIN:<ul style="list-style-type: none">• Country code – from which country the vehicle was manufactured• Manufacturer – the name of the automotive manufacturer• Make – the vehicle category (optional, as this usually depends on the manufacturer)• Vehicle description section• Check digit• Year model• Vehicle identification section
Search VIN	<ol style="list-style-type: none">1. A search bar should be placed on the upper right hand corner of the screen.2. After user keyed in the VIN, search result should be displayed. It should be expected for the program to display either of the possible results: that VIN does not exist or that there is only one VIN stored into the database. No more than one VIN should be on the search result as it is a unique identifying code.3. Search result should display following information: VIN and car's owner name.

On the other hand, the non-functional requirements are stated in the table below:

NON-FUNCTIONAL REQUIREMENTS	
Requirement qualities	Details
Accessibility	Language to be used, including help texts will be provided in full Australian English.
Availability	<ol style="list-style-type: none">1. All functions can be performed anytime.2. VIN search function is available for use only for Department of Transport (WA) and WA Police Department.
Backup and recovery	<ol style="list-style-type: none">1. The database will be backed up on a daily basis.2. If such an unexpected system downtime occurs, recovery will be available within 1 working day.
Capacity	<ol style="list-style-type: none">1. A maximum of 2,000,000 data will be stored.2. A maximum of five users can use the system on different computers at the same time.
Compatibility	Reports can be exported to PDF, Excel and Word 2007 (and onwards) file format.
Performance	Application should respond no more than a second.
Security	All users must have to login first using username and password before performing any functions in the application.

II. How can application be used

In order for the application to start, the computer to be used must establish connection to the server. Once connected, user can perform following functions:

1. Adding new VIN

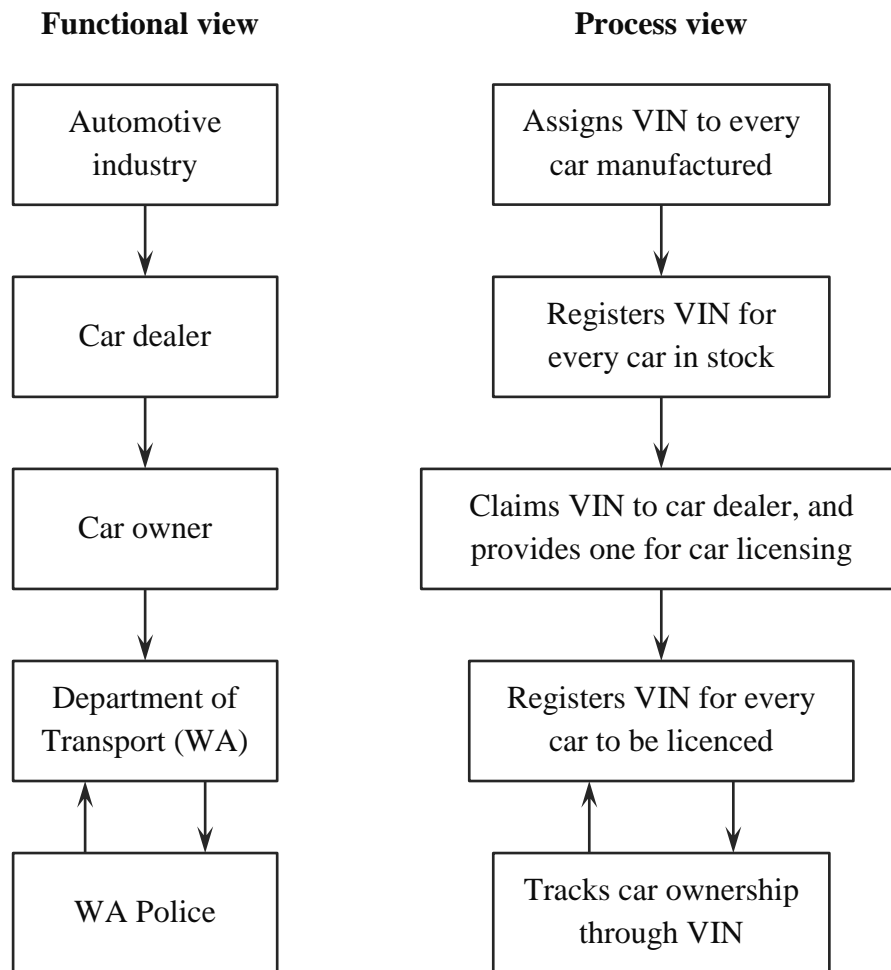
- This function will only be used if the user attempts to register newly assigned VIN, and to register new car to be licenced. VIN validation takes place in this function.

2. Searching a VIN

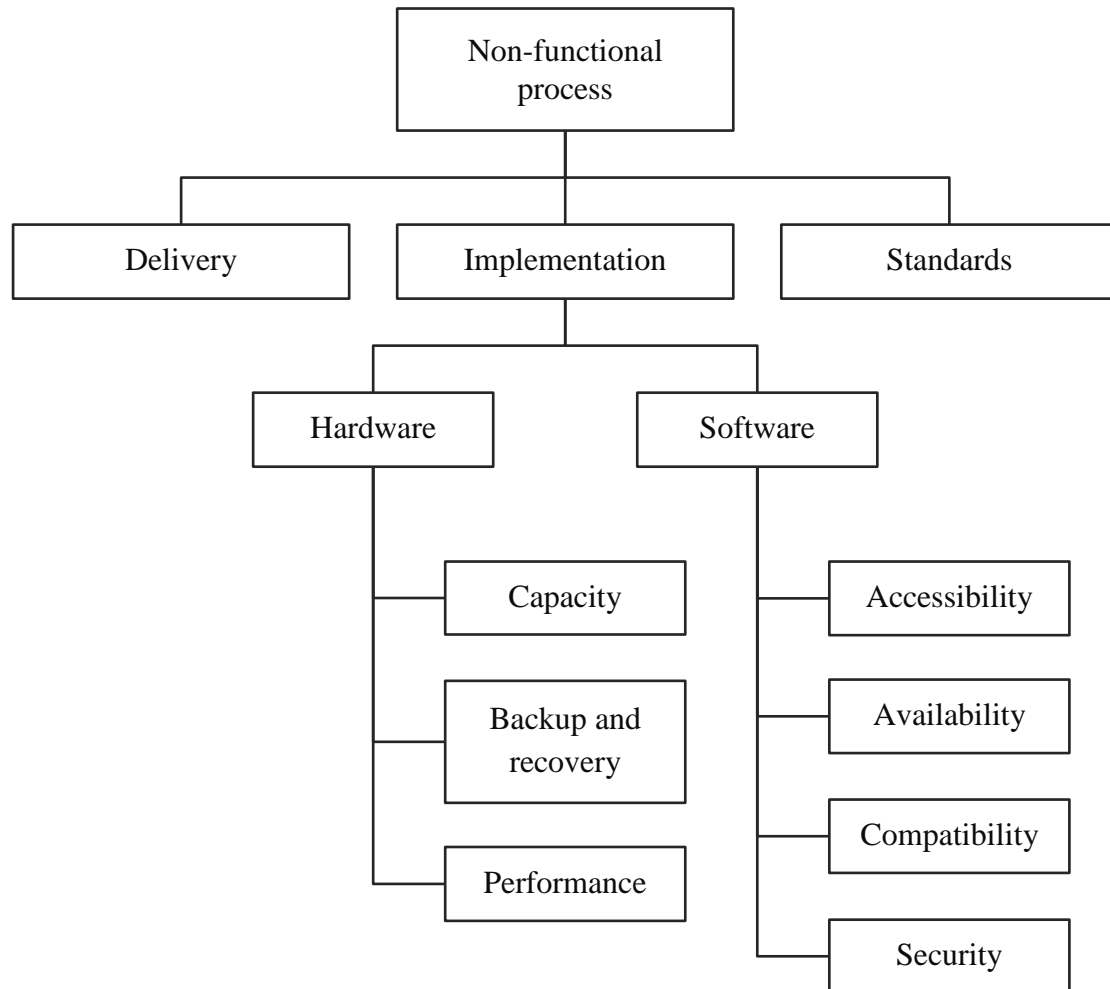
- A search bar is constantly placed on the upper right hand corner of the screen, regardless of the function that is currently running.

III. Requirements processes

The following shows the functional process.



The following shows the non-functional process.



FEASIBILITY OF THE PROJECT

This section includes feasibility analysis of the project, in terms of platforms, equipment and software, development costs, and development duration.

I. Operating system to be used

The program will be developed using Java programming language; thus, it is expected to run on platforms or operating systems (OS) compatible with Java 7. Latest or recent operating systems are also an important factor to consider in using this program in order to maintain and to sustain non-functional requirements. Such OS are:

- a. Windows 7/8
- b. Windows Server 2008/2012 (64-bit only)
- c. Mac OS X 10.7.3 or later
- d. Ubuntu Linux 10.04 and above (64-bit only)
- e. Red Hat Enterprise Linux 5.5 and above
- f. Solaris x64/x86/SPARC

II. Equipment and software

The following are recommended hardware requirements for the equipment to be used for program installation:

- a. RAM 1 GB (for 32-bit)
 2 GB (for 64-bit)
- b. Hard disk space 256 MB (for 32-bit)
 512 MB (for 64-bit)
- c. Processor 1 gigahertz

Stated below are the minimum software requirements for all operating systems mentioned above, in order for the program and functions to execute:

- a. Java 7 version 0 and above
- b. For report generation:
 - Adobe Reader X or later
 - Microsoft Word 2007 or later
 - Microsoft Excel 2007 or later

III. Costs

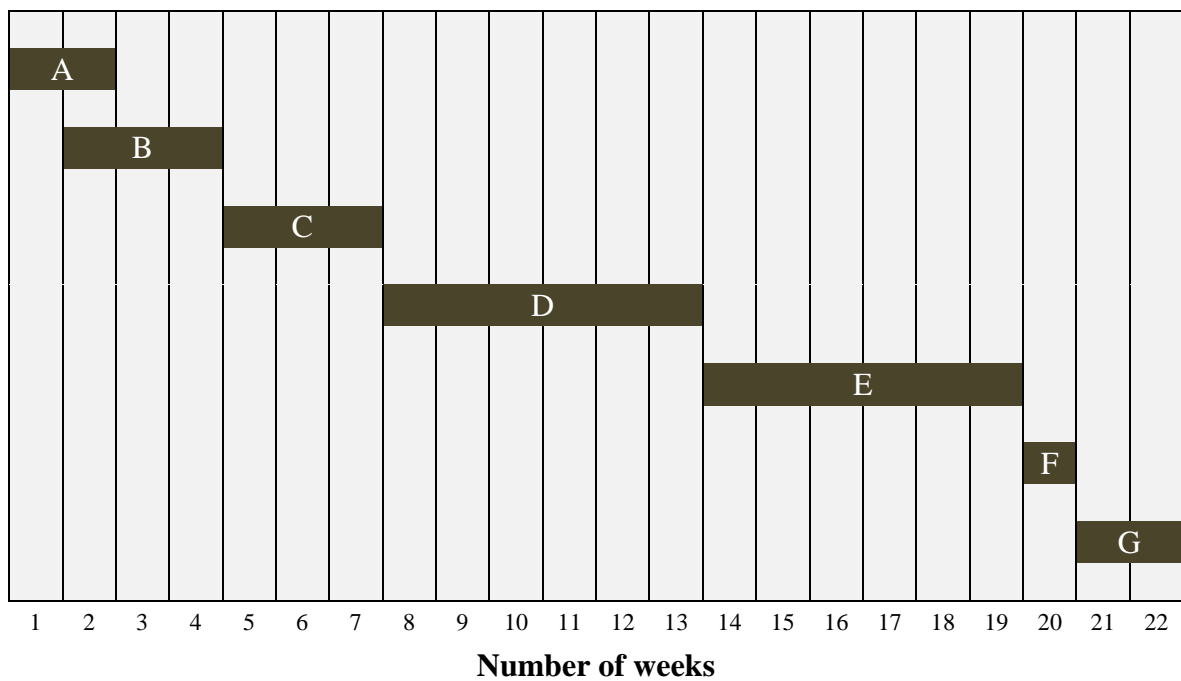
Total costs, comprising software development and installation costs, are determined based on factors shown below:

	Number of staff working			Initial duration estimate (hours)	Rate per hour	Total costs
	Jnr	Mid	Snr			
Software development						
Analysis	0	2	1	185	\$ 30.00	\$ 5,550.00
System designing	0	1	1	115	\$ 30.00	\$ 3,450.00
Coding and development	2	2	2	225	\$ 30.00	\$ 6,750.00
Testing	3	2	1	225	\$ 20.00	\$ 4,500.00
Deployment and installation	0	1	1	54	\$ 10.00	\$ 540.00
Total software development costs	5	8	6	804	\$ 120.00	\$ 20,790.00
Staff						
Effort hours				100	\$ 50.00	\$ 5,000.00
Staff productivity					\$ 1,500.00	\$ 1,500.00
Rate at each skill level						
Junior (5)				1125	\$ 25.00	\$ 28,125.00
Mid (8)				6432	\$ 30.00	\$ 192,960.00
Senior (6)				4824	\$ 35.00	\$ 168,840.00
Total staff costs				12481	\$ 1,640.00	\$ 396,425.00
Hardware					Quantity	Price
Server hardware					1	\$ 2,200.00
Server operating system					1	\$ 1,000.00
Total hardware costs					2	\$ 3,200.00
Overall estimated total costs				\$ 13,285.00	\$ 1,760.00	\$ 420,415.00

IV. Duration of the development

The project covers an estimated 22 weeks of development. Shown below is the project schedule indicating letters A to G, which are the software development phases, and the corresponding number of weeks used to spend on. The following are the phases:

- A - Requirements analysis
- B - System analysis
- C - System designing
- D - Coding and development
- E - Integration and testing
- F - Presentation of the system
- G - Acceptance and deployment

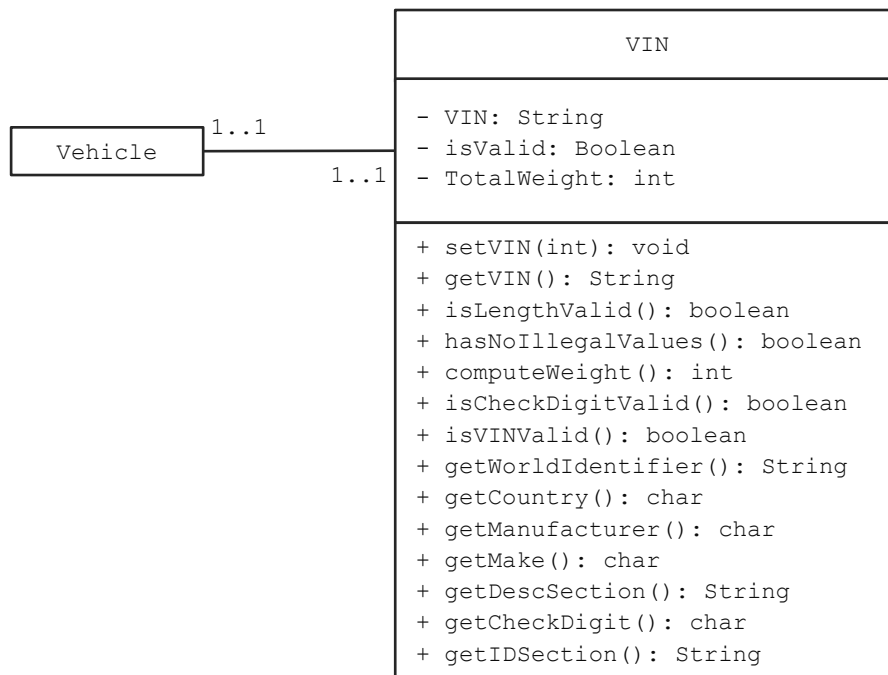


HIGH-LEVEL SYSTEM SOLUTION

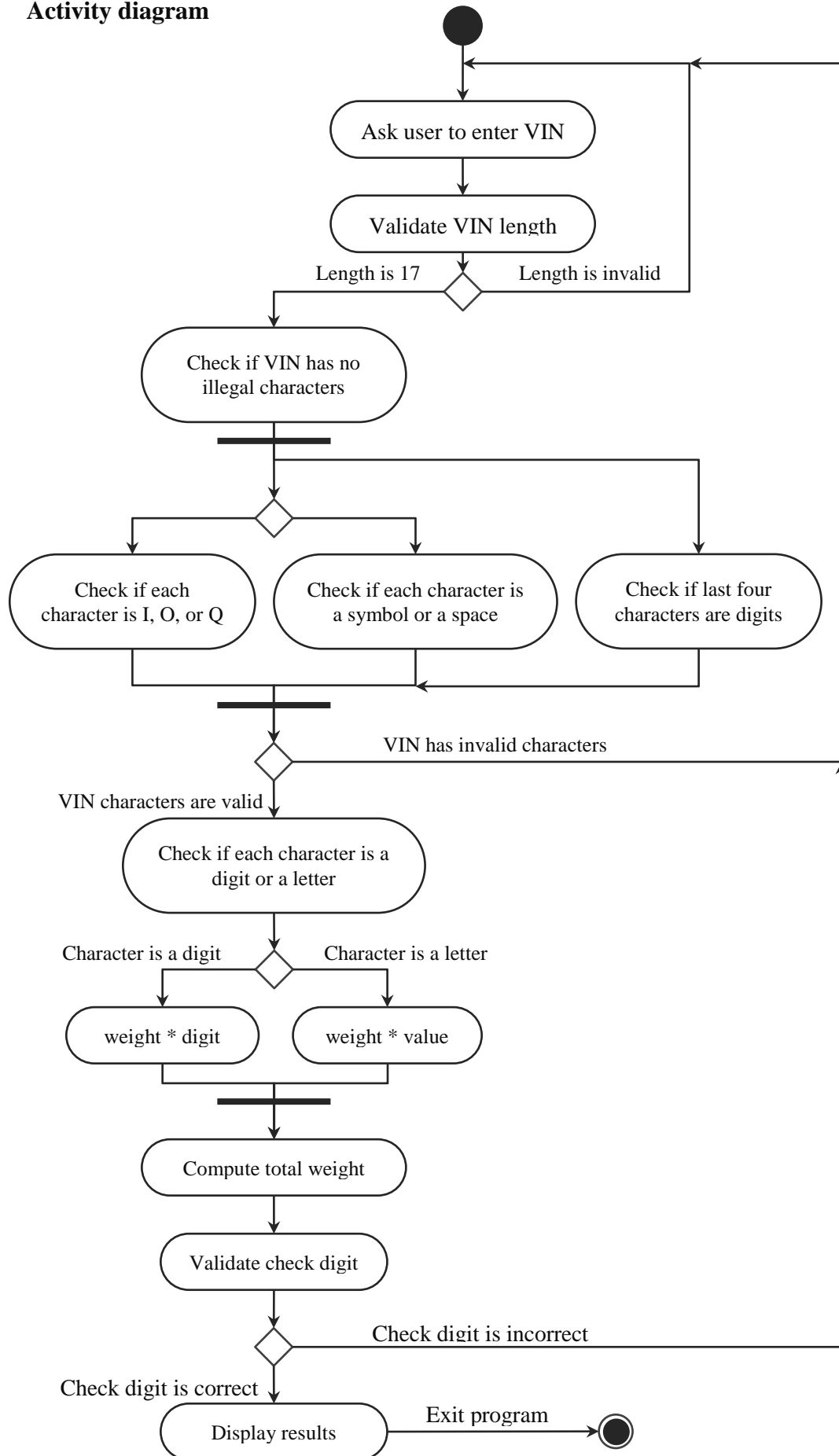
This section includes UML diagrams applied in the application, specifically class and activity diagrams.

I. Class diagram

Shown below is the class diagram, presenting the static fields and methods of VIN class and its relationship to Vehicle class. VIN is considered as a unique identifying code for vehicles. Thus, for every vehicle, there must be only one VIN assigned to it. VIN class hold three static fields and 14 methods. Each method is significant to comply with the validity of VINs and to specify its format and sections.



II. Activity diagram



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