

## Lab – Compare Data with a Hash

### Objectives

Use a hashing program to verify the integrity of data.

### Background / Scenario

It is important to understand when data has been corrupted or it has been tampered with. A hashing program can be used to verify if data has changed, or if it has remained the same. A hashing program performs a hash function on data or a file, which returns a (usually much shorter) value. There are many different hash functions, some very simple and some very complex. When the same hash is performed on the same data, the value that is returned is always the same. If any change is performed on the data, the hash value returned will be different.

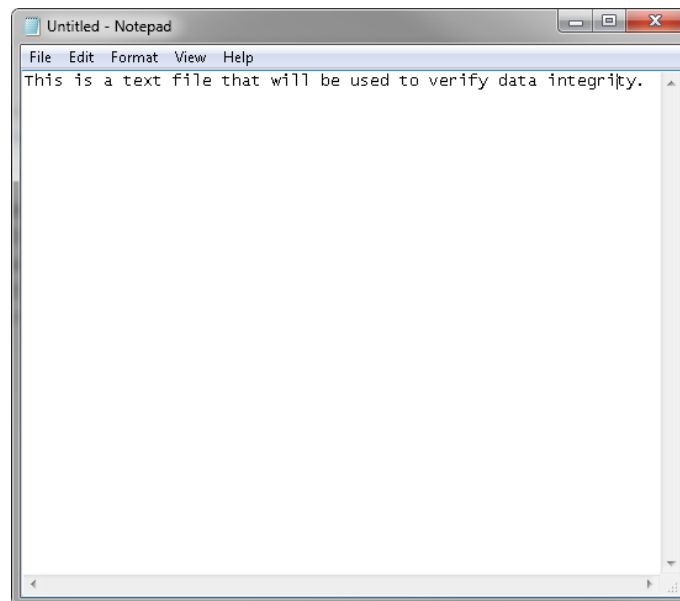
**Note:** You will need installation privileges and some knowledge of the process to install Windows programs.

### Required Resources

- PC with Internet access

### Step 1: Create a Text file

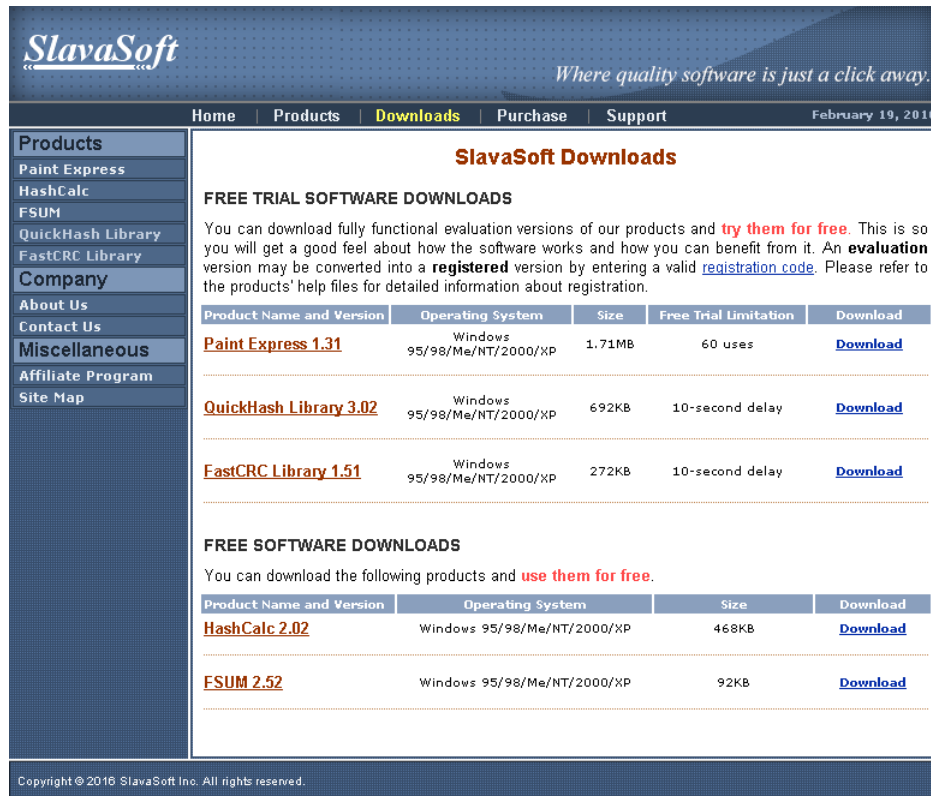
- a. Search your computer for the Notepad program and open it.
- b. Type some text in the program.



- c. Choose **File > Save**.
- d. Navigate to **Desktop**.
- e. Type **Hash** in the **File name:** field, and click **Save**.

### Step 2: Install HashCalc

- a. Open a web browser and navigate to <http://www.slavasoft.com/download.htm>.



The screenshot shows the SlavaSoft website with a navigation menu on the left and a main content area. The main content area is titled "SlavaSoft Downloads" and features two sections: "FREE TRIAL SOFTWARE DOWNLOADS" and "FREE SOFTWARE DOWNLOADS".

**FREE TRIAL SOFTWARE DOWNLOADS**

You can download fully functional evaluation versions of our products and **try them for free**. This is so you will get a good feel about how the software works and how you can benefit from it. An **evaluation** version may be converted into a **registered** version by entering a valid [registration code](#). Please refer to the products' help files for detailed information about registration.

Product Name and Version	Operating System	Size	Free Trial Limitation	Download
<a href="#">Paint Express 1.31</a>	Windows 95/98/Me/NT/2000/XP	1.71MB	60 uses	<a href="#">Download</a>
<a href="#">QuickHash Library 3.02</a>	Windows 95/98/Me/NT/2000/XP	692KB	10-second delay	<a href="#">Download</a>
<a href="#">FastCRC Library 1.51</a>	Windows 95/98/Me/NT/2000/XP	272KB	10-second delay	<a href="#">Download</a>

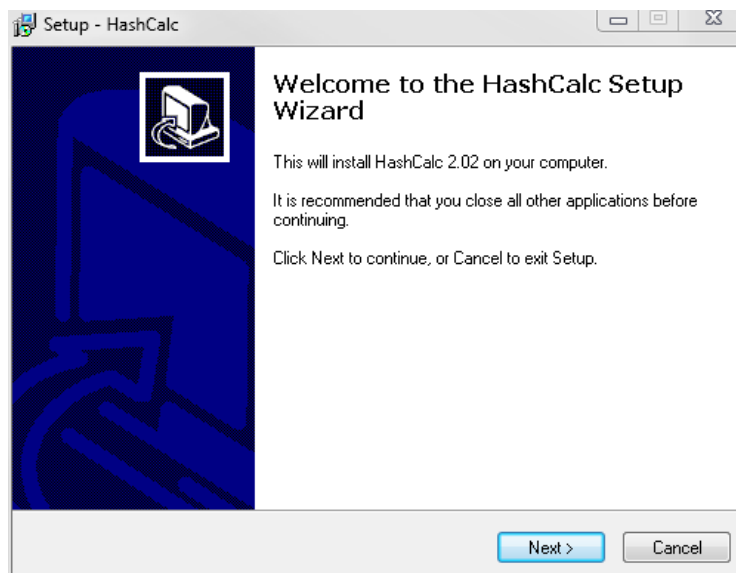
**FREE SOFTWARE DOWNLOADS**

You can download the following products and **use them for free**.

Product Name and Version	Operating System	Size	Download
<a href="#">HashCalc 2.02</a>	Windows 95/98/Me/NT/2000/XP	468KB	<a href="#">Download</a>
<a href="#">FSUM 2.52</a>	Windows 95/98/Me/NT/2000/XP	92KB	<a href="#">Download</a>

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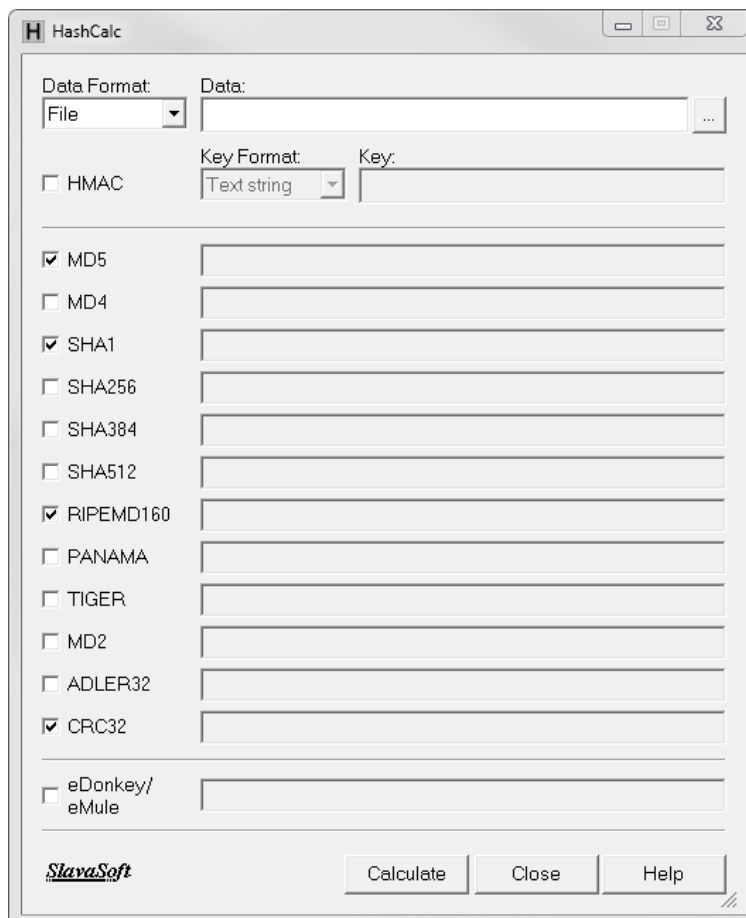
- b. Click **Download** in the **HashCalc 2.02** row.
- c. Open the **hashcalc.zip** file and run the **setup.exe** file inside.



- d. Follow the installation wizard to install HashCalc.

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- e. Click **Finish** on the last screen, and close the **README** file if it opened. You may read the file if you wish.
- f. HashCalc is now installed and running.



### Step 3: Calculate a hash of the Hash.txt file

- a. Set the following items in HashCalc:
  - 1) Data Format: **File**.
  - 2) Data: Click the ... button next to the Data field, navigate to the **Desktop** and choose the **Hash.txt** file.
  - 3) Uncheck **HMAC**.
  - 4) Uncheck all hash types except **MD5**.
- b. Click the **Calculate** button.

What is the value next to **MD5**?

426c2b446d3f5451b9d61e6fb067c51a

### Step 4: Make a change to the Hash.txt file

- a. Navigate to the **Desktop** and open the **Hash.txt** file.
- b. Make a minor change to the text, such as deleting a letter, or adding a space or period.
- c. Click **File > Save**, and close **Notepad**.

### Step 5: Calculate a new hash of the Hash.txt file

- a. Click the **Calculate** button in HashCalc again.

What is the value next to **MD5**?

3f7c082ebce2b1574f78099665320611

Is the value different from the value recorded in Step 3?

yes

- b. Place a check mark next to all of the hash types.
- c. Click **Calculate**.
- d. Notice that many of the hash types create a hash of a different length. Why?

different hash types use different encoding schemes therefore, hash value is of different for the same string