Experiment No 7

Create and Verify Hash Code For Given Message

I. Minimum Theoretical Background

A hash value is a numeric value of a fixed length that uniquely identifies data. Hash values represent large amounts of data as much smaller numeric values, so they are used with digital signatures. You can sign a hash value more efficiently than signing the larger value. Hash values are also useful for verifying the integrity of data sent through insecure channels. The hash value of received data can be compared to the hash value of data as it was sent to determine whether the data was altered.

Application of Hash code:

1. Verifying the integrity of messages and files
2. Signature generation and verification
3. Password verification
4. Proof-of-work
5. File or data identifier

A cryptographic hash function (CHF) is a hash function that is suitable for use in cryptography. It is a mathematical algorithm that maps data of arbitrary size (often called the "message") to a bit string of a fixed size (the "hash value", "hash", or "message digest") and is a one-way function, that is, a function which is practically infeasible to invert. Ideally, the only way to find a message that produces a given hash is to attempt a brute-force search of possible inputs to see if they produce a match, or use a rainbow table of matched hashes. Cryptographic hash functions are a basic tool of modern cryptography.

Code :

```
#include <iostream>
#include <string>
#include <sstream>
#include <algorithm>
using namespace std;
unsigned int SHF(string input)
{
```

```
    unsigned int Init=124564352;
    unsigned int Magic=5674356;
    unsigned int Hash;
    for(int i=0;i<input.length();i++)
    {
        Hash=Hash^(input[i]);
        Hash =Hash*Magic;
    }
    return Hash;
}
string ToHex(unsigned int input)
{
    string HexHash;
    stringstream hexstream;
    hexstream << hex << input;
    HexHash=hexstream.str();
    std::transform(HexHash.begin(),HexHash.end(),HexHash.begin(),::toupper);
    return HexHash;
}
int main()
{
    cout<<"text hashed is "<<ToHex(SHF("text"));
    getchar();
}
```

OutPut:

II. Conclusion

Hence we have successfully Create and Verify Hash Code For Given Message.

III. Exercise

Q.1 What Is Meant By Hashing?

Q.2 What are the characteristics of good hash function?

Q3. Why is hashing important**?**

Q4. What are the different hashing methods**?**

Q5**.** What are the advantages of hashing?

Q6. What is a Hash used for**?**

Answers

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Marks obtained			Dated signature of Teacher
Process Related (15)	**Product Related (10)**	**Total(25)**	