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| Project 2 Program |
| +main() : int  +Calculate(vector<Customer>& customers, vector<Book>& books) : void |

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| Book |
| +Book(string a\_isbn, string a\_title, int a\_index) : ISBN(a\_isbn), title(a\_title), index(a\_index)  +Book()  +calculate(…) : void  +set\_review(…) : void  +get\_book\_similarity() : vector<double>  +get\_reviews() : vector<int>  +get\_index() : int  +get\_title() : string const  +get\_isbn() : string  +print\_reviews() : void  +get\_closest\_book() : int  +operator<(const Book& b1) const : bool  +get\_average\_rating() : int  +set\_average\_rating(int n) : void  +operator<<(ostream& os, const Book& b1) : friend ostream& |
| -ISBN : string  -title : string  -index : int  -reviews : vector<int>  -book\_similarity : vector<double>  -closest\_book : int\  -average\_rating : int |

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| Customer |
| +Customer(int a\_id, string a\_name) : ID(a\_id),name(a\_name)  +Customer()  +set\_rating(…) : void  +calculate(…) : void  +RecommendBooks(vector<Book>& books) : bool  +TraverseBooks(…) : void  +get\_id() : int  +get\_name() : string  +get\_user\_similarity() : vector<double>  +get\_reviews() : vector<int>  +print\_reviews : void |
| -ID : int  -name : string  -average\_score : int  -reviews : vector<int>  -user\_similarity : vector<double>  -most\_similar\_users : vector<int>  -Recommended\_Books : Binary\_Search\_Tree<int> |

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| Binary\_Search\_Tree |
| +Binary\_Search\_Tree() : Binary\_Tree<Item\_Type>()  +insert(Item\_Type& item) : virtual bool  +erase(const Item\_Type& item) : virtual bool  +min() const : const Item\_Type\*  +min(BTNode<Item\_Type>\* local\_root) const : const Item\_Type\*  +max() const : const Item\_Type\*  +max(BTNode<Item\_Type>\* local\_root) const : const Item\_Type\*  +find(const Item\_Type& target) const : const Item\_Type\*  +startsWith(…) const : void  +startsWith(…) const : const vector<Book>  +startsWith\_isbn(…) const : void  +startsWith\_isbn(…) const : const vector<Book> |
| -insert(…) : virtual bool  -erase(…) : virtual bool  -find(…) const : const Item\_Type\*  -replace\_parent(…) : virtual void |

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| Functions |
| double calculate\_cosine\_sim(vector<int> v1, vector<int> v2)  int find\_max(vector<double> v1) |

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| Binary Tree |
| +setRoot(…) : void  +Binary\_Tree() : root(NULL)  +Binary\_Tree()  +~Binary\_Tree() : virtual  +get\_left\_subtree() const : Binary\_Tree<Item\_Type>  +get\_right\_subtree() const : Binary\_Tree<Item\_Type>  +get\_data() const : const Item\_Type&  +is\_null() const : bool  +is\_leaf() const : bool  +to\_string() const : virtual string  +read\_binary\_tree(…) : static Binary\_Tree<Item\_Type>  +read\_tree(…) : void  +read\_binary\_tree(…) : Binary\_Tree<Item\_Type>  +root\_to\_string() const : string  +pre\_order() const : string  +post\_order() const : string  +in\_order() const : string  +height() const : int  +number\_of\_nodes() const : int |
| #Binary\_Tree(BTNode<Item\_Type>\* new\_root) : root(new\_root)  #root : BTNode<Item\_Type>\* |
| -pre\_order(…) const : string  -post\_order(…) const : string  -in\_order(…) const : string |

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| User Interface |
| + User\_Interface(const string& \_cust\_file\_path,const string& \_book\_file\_path,const string& \_rating\_file\_path) : cust\_file\_path(\_cust\_file\_path), book\_file\_path(\_book\_file\_path), rating\_file\_path(\_rating\_file\_path)  +run\_ui() : void  +choice\_1(cust\_id : int) : void  +load\_customers() : vector<Customer>  +load\_books() : vector<Book>  +load\_ratings(…) : void |
| -cust\_file\_path : string  -book\_file\_path : string  -rating\_file\_path : string  -customers : vector<Customers>  -books : vector<Book>  -title\_tree : Binary\_Search\_Tree<string>  -isbn\_tree : Binary\_Search\_Tree<string> |

main.cpp…

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| String Tokenizer |
| +String\_Tokenizer(string source, string delim = " ") : the\_source(source), the\_delim(delim), start(0), end(0)  +has\_more\_tokens() : bool  +next\_token() : string |
| -find\_next() : void  -trim(const string& token) : string  -the\_source : string  -the\_delim : string  -start : size\_t  -end : size\_t |

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| BTNode : struct |
| data : Item\_Type  left : BTNode<Item\_Type>\*  right : BTNode<Item\_Type>\*  BTNode(…)  ~BTNode(…) : virtual  to\_string(…) : virtual string |