**Pseudocode 1**

**START** program

**SET** string *csvPath* to course list file path

**CREATE** hash table of courses named *courseTable*

**TRY** to open path

**IF** file format is good

**SET** Parser file = Parser sending *csvPath* as the argument

**OPEN** csvPath

**WHILE** file is open

**ITERTERATE** through each line

**SPLIT** line into array by commas

**IF** current line size is equal to 2

**INVOKE** Insert() function sending currentcourse object to *courseTable*

**ELSE IF** current line size is equal to 3 or 4

**ITERTERATE** through elements 3 and 4

**IF** element’s Number not in *courseTable*

**EXIT** iteration

**ELSE**

**CONTINUE**

**ELSE**

**CONTINUE**

**CLOSE** file

**CATCH** error

**IF** file not open

**THROW** exception

**END** program

**Pseudocode 2**

**START** program

**SET** string *csvPath* to course list file path

**SET** Parser file = Parser sending *csvPath* as the argument

**CREATE** hashTable of courses named *courseTable*

**READ** in csvPath

**WHILE** not at end of file

**ITERATE** threw each line

**SPLIT** current line into elements in an array at commas

**CREATE** Course named *course*

**SET** course’s *courseNumber* equal to current lines first element

**SET** course’s *courseName* equal to current lines second element

**IF** *prerequisite1* does not exist

**SET** course’s *prerequisite1* equal to null

**ELSE**

**SET** course’s *prerequisite1* equal to current lines third element

**IF** *prerequisite2* does not exist

**SET** course’s *prerequisite2* equal to null

**ELSE**

**SET** course’s *prerequisite2* equal to current lines fourth element

**CREATE** an unsigned variable named *key*

**SET** key to the string value to of hash() function sending bid’s bidId

**CREATE** Node pointer named *preNode*

**SET** *preNode* to the pointer at node’s *key*

**IF** *preNode*’s key is equal to UINT\_MAX

**SET** *preNode*’s key to *key*

**SET** *preNode*’s bid to *bid*

**SET** *preNode*’s next to nullptr;

**ELSE**

**WHILE** *preNode*’s next is not equal to nullptr

**SET** *preNode* equal to *preNod*e’s next

**SET** *preNode*’s next equal to new node sending *bid* and *key* as arguments

**CLOSE** file

**END** program

**Pseudocode 3**

**START** program

**ITERATE** through *nodes* from beginning to end

**IF** the current *key* is not equal to UINT\_MAX

**OUTPUT** “KEY” + the current *key* + “: “ + the current *bid*’s bidId

**OUTPUT** “ | “ + the current *bid*’s title + “ | “ + the current *bid*’s fund

**SET** Node pointer *node* equal to the current node’s next

**WHILE** *node* is not equal to nullptr

**OUTPUT** “KEY” + the current key + “: “ + the current *bid*’s bidId

**OUTPUT**  “ | “ + the current *bid*’s title + “ | “ + the current *bid*’s amount + the current bid’s fund

**SET** *node* equal to *node*’s next

**RETURN**

**END** program