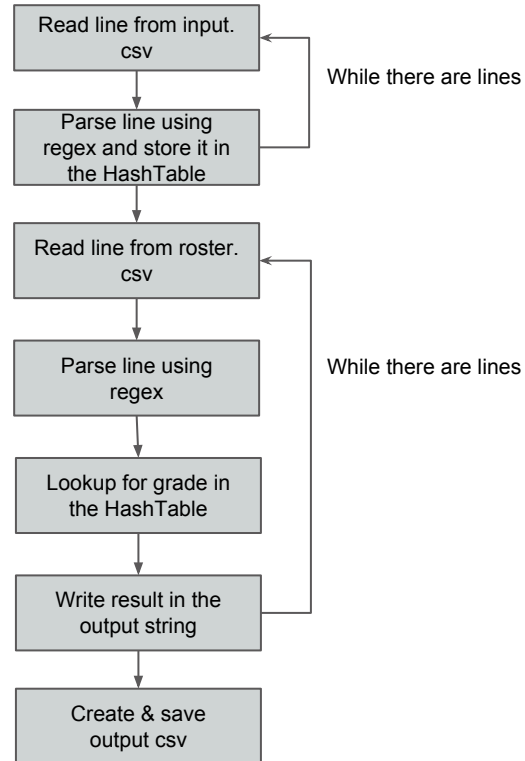


Goal

- Record students grades into a spreadsheet
 - Problem:
 - Not all students submit every assignment
 - How to quickly obtain the grades of those who submitted it?
-

Flow chart



Data structures

- Node class
 - Holds data read from input file
 - HashTable
 - Used for fast lookup when recording the data into an output file
-

Data structures - HashTable

- Hash

```
ulong hash(const unsigned long key) {  
    // your hash function  
}
```

- Insert

```
void insert(const ulong key, void* value) {  
    // your insert function  
}
```

- Remove

```
ulong remove(const ulong key) {  
    // your remove function  
    // you can leave this function empty.  
    // we won't use remove in this project. This is a general hash table template.  
}  
void* search(const ulong key) {
```

- Search

```
    // your search function  
}
```

Regular expression

- **regex class**
 - Where you define the expression used on the search
- **smatch class**
 - Store the desired results from the search matches
- **regex_search**
 - Performs the search on the input string, storing the desired matches on the smatch variable

```
std::regex_search(sLine, matched_result, expr)
```

Input files

- input.csv
 - Records of students with a grade for the assignment

Echo Wells	accumsan.neque@acmetus.com	800000079	94
Candace Bishop	adipiscing@bibendum.com	800000057	49
Conan Daugherty	allquam.arcu.Allquam@nequenon.net	800000053	96
Emmanuel Chan	arcu.Vestibulum@Etiamvestibulummassa.com	800000062	41
Beatrice Morgan	augue@tempus.edu	800000055	47
Ruth Woods	augue@vitae.org	800000001	99
Ursula Dickson	congue.In@velsapien.com	800000051	60
Donna Dennis	consectetuer@turpis.net	800000021	64
Sydney Holloway	cubilia.Curae.Phasellus@nibhdolor.net	800000003	66
Tarik Sargent	cubilia.Curae@vehiculaet.edu	800000009	73
Kiona Santana	Cum.socils.natoque@tristiquealliquetPhasellus.co.uk	800000069	68
Travis House	Donec.at@risusMorbi.net	800000046	40
Basil Moon	Donec.nibh@Donecnonjusto.org	800000081	54
Barbara Walter	Donec@placervelitQuisque.edu	800000005	84
Echo Haymes	dui.in.sodales@eget.net	800000074	64
Keely Graham	dui@anteipsumprimis.co.uk	800000043	47
Taylor Roberson	Duis.mi.enim@aceleifendvitae.edu	800000052	72
Bertha Rodriguez	Duis.volutpat.nunc@uteros.ca	800000032	44
Deacon Richards	eget.dictum@eget.com	800000066	90
Mikayla Grant	eget.dictum@tincidunttempusrisus.edu	800000044	37
Tucker Mullen	eget.metus.eu@iacus.net	800000090	31
Ruth Marquez	eget@Fusce.org	800000070	89
Vance Everett	elit.pellentesque@bibendum.edu	800000050	77

Input files

- roster.csv
 - Records of all students enrolled in the class

Alfonso Livingston	mattis@dolor.co.uk	800000092
Alice Carr	Fusce@tristiquepellent	800000031
Armand Bowen	nec@tellusPhasellus.cc	800000048
Aubrey Everett	tempor.augue.ac@Cras	800000027
Aurelia Donovan	metus.eu.erat@at.ca	800000010
Barbara Walter	Donec@placeratvelitQ	800000005
Basia Burch	ut.aliquam@Quisque.e	800000061
Basil Moon	Donec.nibh@Doneco	800000081
Beatrice Morgan	augue@tempus.edu	800000055
Bertha Rodriguez	Duis.volutpat.nunc@ut	800000032
Branden Rasmussen	nisl@eu.ca	800000077
Candace Bishop	adipiscing@bibendum.	800000057
Carson Thompson	Suspendisse.aliquet.ser	800000049
Cathleen Bowen	habitant@elementumpr	800000020
Celeste Nguyen	Sed.nulla@Fusce.net	800000094
Chadwick Clarke	et@viverra.edu	800000073
Charles Mercado	vita@sapienNuncpulv	800000030
Chiquita Beard	erat@aliquamerosturpi	800000056
Clayton Herman	eu.lacus.Quisque@fam	800000006
Conan Daugherty	aliquam.arcu.Aliquam	800000053
Danielle Bates	sed.orci@jdi libero.org	800000012
Deacon Richards	eget.dictum@eget.com	800000066
Debra Hall	Etiam.imperdiet.dietun	800000058
Delilah McIntyre	nunc@quamCurabitur.	800000011
Dexter Blankenship	lectus.pede.ultrices@cc	800000086
Donna Dennis	consectetuer@turpis.ne	800000021
Eagan Delaney	orci.luctus@odio.co.uk	800000026
Echo Haynes	dui.in.sodales@eget.ne	800000074
Echo Wells	accumsan.neque@acm	800000079

Output file

Alfonso Livin	mattis@dolo	800000092	
Alice Carr	Fusce@tristi	800000031	
Armand Bow	nec@tellusP	800000048	
Aubrey Ever	tempor.augu	800000027	
Aurelia Don	metus.eu.era	800000010	
Barbara Wal	Donec@plac	800000005	84
Basia Burch	ut.aliquam@	800000061	
Basil Moon	Donec.nibh@	800000081	
Beatrice Mor	augue@tem	800000055	47
Bertha Rodri	Duis.volutpa	800000032	
Branden Ras	nisl@eu.ca	800000077	
Candace Bish	adipiscing@k	800000057	49
Carson Thom	Suspendisse.	800000049	