Assignment 3

Due Date: Thursday, August 5th

You are writing a start-up-loan approval system for a bank.

The bank takes a maximum of 5000 loan applications and denies them only if the applicant doesn't qualify (he/she is not educated or experienced in the field). If the applicant qualifies, the loan will be eventually approved (although there is no guarantee if that happens in the lifetime of the applicant!).

The bankers may write commands like the following:

save_application

parameters:

string applicant_full_name // This is unique and identifies a loan_application.
int years_of_relevant_education
int years_of_relevant_experience
int loan_amount
int* estimated_yearly_profits // A sequence for how much the bank would profit from the customers' payback in each year (for up to 30 years)

explanation: saves the incoming application into an active_applications list

make_decisions

parameters:

string decision_date
int budget

explanation: denies the applications (i.e. removes them from active_applications and saves them to denied_applications list) where the sum of education and experience years is smaller than 10. Approves applications (i.e. removes them from active_applications and saves them to approved_applications list) in the order of their priority (defined later) if enough money is left from the given budget. priority is defined as the average of estimated_yearly_profits.

print

explanation: prints the active_applications, approved_applications, and denied_applications, to the standard output. It writes the name of the list followed by all the items (in any order) separated by the tab character ('\t') or the space character (' '). Each item in the active_applications list is printed as ("full_name",loan_amount) and each item in the other two lists is printed as ("full_name",loan_amount,"decition_date").

input to the program:

The commands are saved in a text file, each at a line where the command and parameters are separated via the tab character('\t'). The program reads the file and runs the commands. For example if the following is the content of a commands.txt file:

```
save_application        "Golnar Sheikhshab"     10      3       150000  0       0       24000   40000   50000   24000
save_application        "John Smith"    6       3       150000  0       0       25000   50000   50000   25000
save_application        "Larry Page"    8       25      150000000       0       150000000
save_application        "Some Guy"      4       13      120000  0       60000   80000   40000
save_application        "Some Gal"      7       10      120000  0       60000   80000   40000
make_decisions  "Oct 2nd, 2017" 300000
print
```

In the first application, the applicant_full_name is "Golnar Sheikhshab", the years_of_relevant_education and years_of_relevant_experience are 10 and 3 respectively, the loan_amount is 150000, and estimated_yearly_profits is {0, 0, 24000, 40000, 50000, 24000} making the priority = (0 + 0 + 24000 + 40000 + 50000 + 24000)/6 = 23000. Note that the number of years in estimated_yearly_profits differ from application to application.

Here is what happens when we run the program

```
./loan_approval.o       commands.txt
active_applications     ("Larry Page",150000000)        ("Golnar Sheikhshab",150000)
approved_applications   ("Some Guy",120000,"Oct 2nd, 2017")     ("Some Gal",120000,"Oct 2nd, 2017")
denied_applications     ("John Smith",150000,"Oct 2nd, 2017")
```