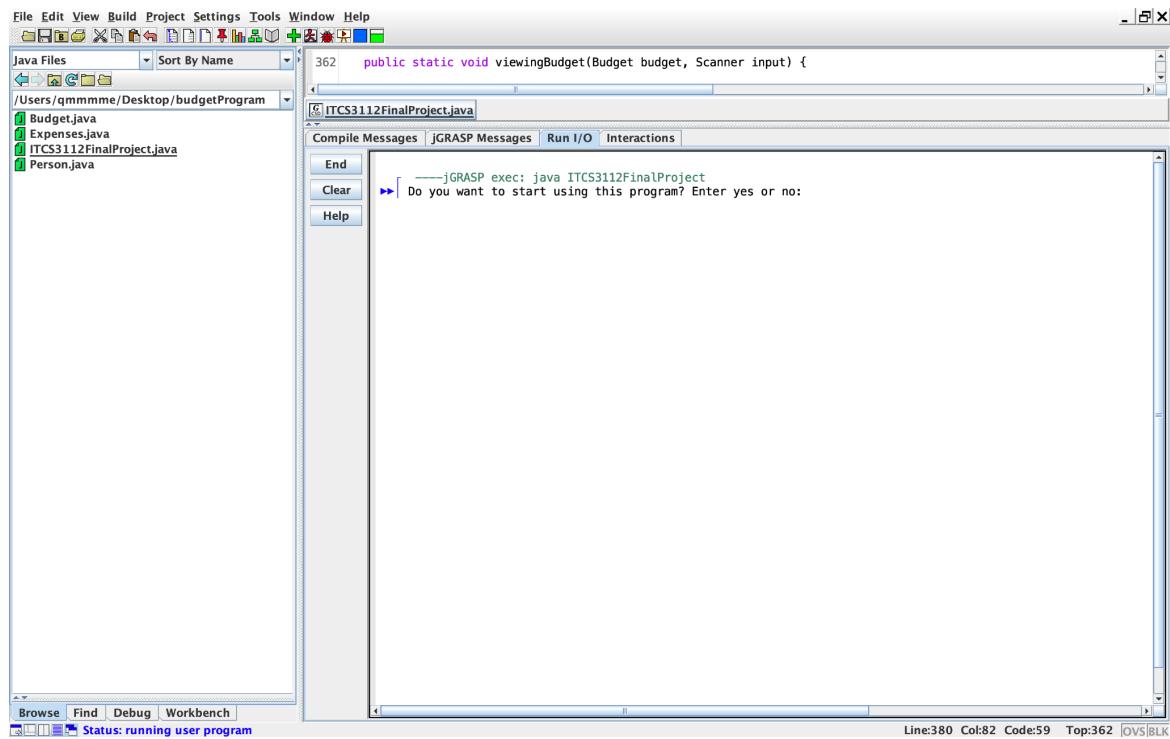


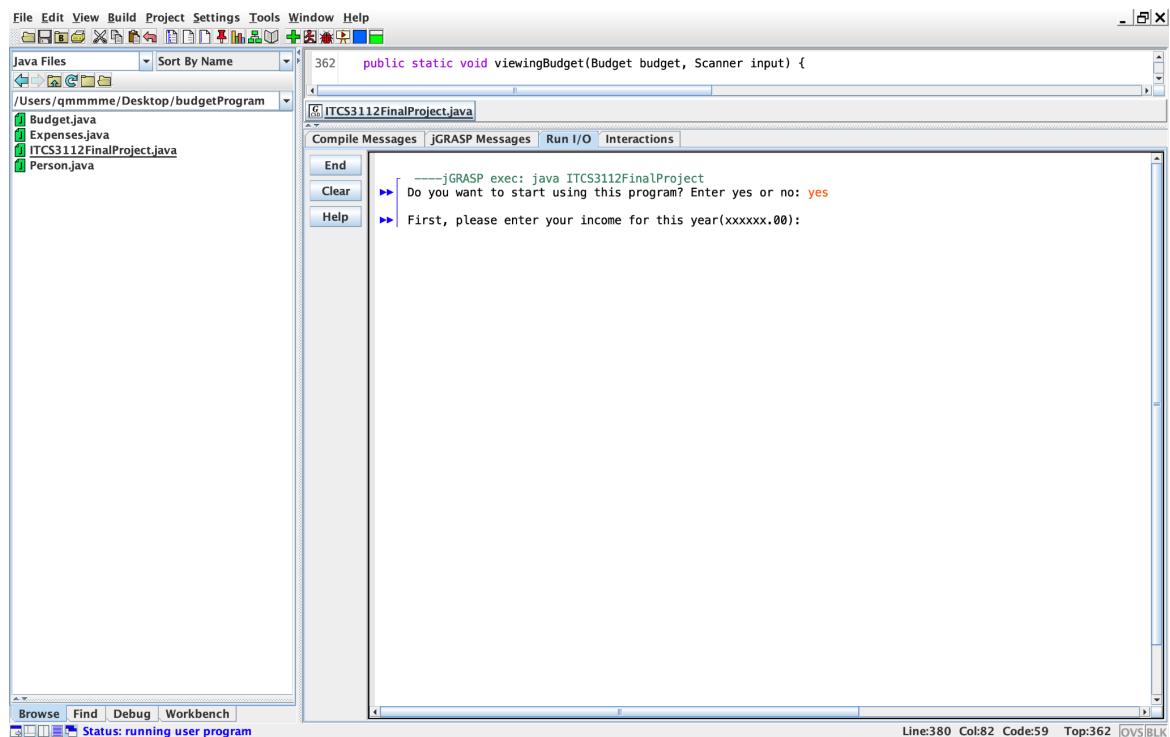
Since I have used Java for the final project, so the project could be run by any Java support application or software(I utilize jGRASP in this case)

First, open the ITCS3112FinalProject.java file, and compile and run it.



The screenshot shows the jGRASP IDE interface. The menu bar includes File, Edit, View, Build, Project, Settings, Tools, Window, Help. The toolbar has icons for New, Open, Save, Cut, Copy, Paste, Find, Replace, Run, Stop, and Exit. The left sidebar shows a tree view of Java files under '/Users/qmmme/Desktop/budgetProgram': Budget.java, Expenses.java, ITCS3112FinalProject.java, and Person.java. The main workspace displays the Java code for 'ITCS3112FinalProject.java'. The code editor shows line 362: `public static void viewingBudget(Budget budget, Scanner input) {`. Below the code editor is a 'Compile Messages' window with tabs for 'jGRASP Messages', 'Run I/O', and 'Interactions'. The 'Interactions' tab shows the following text:  
jGRASP exec: java ITCS3112FinalProject  
Do you want to start using this program? Enter yes or no:  
The status bar at the bottom right of the IDE window shows 'Line:380 Col:82 Code:59 Top:362 OVS|BLK'. The overall status is 'Status: running user program'.

Now, if you want to start it type yes, otherwise the program will be finalized.



This screenshot shows the jGRASP IDE interface after the user has typed 'yes' in response to the previous prompt. The 'Interactions' window now displays:  
jGRASP exec: java ITCS3112FinalProject  
Do you want to start using this program? Enter yes or no: yes  
First, please enter your income for this year(xxxxxx.00):  
The status bar at the bottom right shows 'Line:380 Col:82 Code:59 Top:362 OVS|BLK'. The overall status is 'Status: running user program'.

Next, the program will prompt you to enter your required information that includes your yearly income, your personal information.

```

File Edit View Build Project Settings Tools Window Help
Java Files / Sort By Name
/Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCS3112FinalProject.java Person.java
362 public static void viewingBudget(Budget budget, Scanner input) {
ITCS3112FinalProject.java
Compile Messages jGRASP Messages Run I/O Interactions
End Clear Help
-----jGRASP exec: java ITCS3112FinalProject
>> Do you want to start using this program? Enter yes or no: yes
>> First, please enter your income for this year(xxxxxx.00): 44000.00
*Please enter you personal information.
>> Please enter your first name: Quang
>> Please enter your last name: Ho
>> Please enter your date of birth(mm/dd/yyyy): 02/06/1990
>> Please enter your phone number(704-xxx-xxxx): 704-492-1335
>> Please enter your email(example@gmail.com): qho2@uncc.edu
>> Please enter your occupation: Fulltime Student
Thank for providing the personal information.
Please enter your planning budget for this year(Enter 0 for month choosen):
>> What month do you want to add(Choose from 1 to 12, or 0 for ALLYEAR Planning Budget):

```

However, there are instructions on the console that lead you to input correct data as expected, so just following these. To continue with the program, you need to provide the planning budget for your planning year (the current year)

```

File Edit View Build Project Settings Tools Window Help
Java Files / Sort By Name
/Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCS3112FinalProject.java Person.java
362 public static void viewingBudget(Budget budget, Scanner input) {
ITCS3112FinalProject.java
Compile Messages jGRASP Messages Run I/O Interactions
End Clear Help
>> Please enter your first name: Quang
>> Please enter your last name: Ho
>> Please enter your date of birth(mm/dd/yyyy): 02/06/1990
>> Please enter your phone number(704-xxx-xxxx): 704-492-1335
>> Please enter your email(example@gmail.com): qho2@uncc.edu
>> Please enter your occupation: Fulltime Student
Thank for providing the personal information.
Please enter your planning budget for this year(Enter 0 for month choosen):
>> What month do you want to add(Choose from 1 to 12, or 0 for ALLYEAR Planning Budget): ALLYEAR
Invalid month input!
>> Please enter the month again: 0
>> How much do you spend for the housing: 12345
>> How much do you spend for the utilities: 12345
>> How much do you spend for the food: 12345
>> How much do you spend for the transportation: 1235
>> How much do you spend for the medical: 12354
>> How much do you spend for the insurance: 12352
>> How much do you spend for the clothing: 12345
>> How much do you spend for the other thing: 21345
Please enter your first expense:
>> What month do you want to add(Choose from 1 to 12, or 0 for ALLYEAR Planning Budget):

```

Next, you will need to enter the first expenses of a specific month so that a budget object could be created, then you could see all options that the program provide

The screenshot shows a Java development environment with a terminal window open. The terminal window displays a menu for a budget program. The menu includes prompts for entering expenses and a list of seven options for managing the budget. The status bar at the bottom indicates the program is running.

```
File Edit View Build Project Settings Tools Window Help
Java Files Sort By Name
/Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCS3112FinalProject.java Person.java
362 public static void viewingBudget(Budget budget, Scanner input) {
}
[T] ITCS3112FinalProject.java
Compile Messages jGRASP Messages Run I/O Interactions
End Clear Help
Please enter your first expense:
>>> What month do you want to add(Choose from 1 to 12, or 0 for ALLYEAR Planning Budget): 1
>>> How much do you spend for the housing: 123
>>> How much do you spend for the utilities: 123
>>> How much do you spend for the food: 123
>>> How much do you spend for the transportation: 123
>>> How much do you spend for the medical: 123
>>> How much do you spend for the insurance: 123
>>> How much do you spend for the clothing: 123
>>> How much do you spend for the other thing: 123
Here is your options to do with your budget program:
Option 1: Adding expenses(Enter letter a)
Option 2: Updating expenses(Enter letter u)
Option 3: Deleting expenses(Enter letter d)
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)
Option 5: Viewing the personal information(Enter letter p)
Option 6: Set or get planning budget(Enter letter s)
Option 7: Quiting the program(Enter letter q)
>>> What option do you want. Enter a, u, d, v, p, or q :
```

Browse Find Debug Workbench

Status: running user program

Line:380 Col:82 Code:59 Top:362 [DVS|BLK]

As the menu provided, you could adding expenses, updating, deleting, viewing all calculations and expenses, viewing your input personal information, and set or get the new planning budget. However, you could end the program with “q” option.

The screenshot shows the jGRASP IDE interface. On the left, the Java Files browser displays four files: Budget.java, Expenses.java, ITC3112FinalProject.java, and Person.java. The main window shows the code for ITC3112FinalProject.java. The code includes a method for viewing a budget and a switch statement for handling user input. The output pane shows the program's interaction with the user, starting with a list of options and then prompting for adding a new expense. The status bar at the bottom indicates "Status: running user program".

```
File Edit View Build Project Settings Tools Window Help
Java Files Sort By Name
/Users/qmmmm/Desktop/budgetProgram
Budget.java
Expenses.java
ITC3112FinalProject.java
Person.java

362     public static void viewingBudget(Budget budget, Scanner input) {
}

ITC3112FinalProject.java

Compile Messages jGRASP Messages Run I/O Interactions
End Clear Help

Here is your options to do with your budget program:
Option 1: Adding expenses(Enter letter a)
Option 2: Updating expenses(Enter letter u)
Option 3: Deleting expenses(Enter letter d)
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)
Option 5: Viewing the personal information(Enter letter p)
Option 6: Set or get planning budget(Enter letter s)
Option 7: Quiting the program(Enter letter q)

► What option do you want. Enter a, u, d, v, p, or q : a

► What month do you want to add(Choose from 1 to 12, or 0 for ALLYEAR Planning Budget): 2
► How much do you spend for the housing: 123
► How much do you spend for the utilities: 123
► How much do you spend for the food: 123
► How much do you spend for the transportation: 123
► How much do you spend for the medical: 123
► How much do you spend for the insurance: 123
► How much do you spend for the clothing: 123
► How much do you spend for the other thing: 123

► Do you want to add this expense to your records? Enter yes or no: yes
You successfully added this expense to your records.

► Do you want to add another expense? Enter yes or no: no

Line:380 Col:82 Code:59 Top:3
```

This is “a” option to add a new monthly expense

```
File Edit View Build Project Settings Tools Window Help
Java Files Sort By Name
/Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCSS112FinalProject.java Person.java

362 public static void viewingBudget(Budget budget, Scanner input) {
[ITCS3112FinalProject.java]

Compile Messages | JGRASP Messages | Run I/O | Interactions
End Clear Help

Here is your options to do with your budget program:
Option 1: Adding expenses(Enter letter a)
Option 2: Updating expenses(Enter letter u)
Option 3: Deleting expenses(Enter letter d)
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)
Option 5: Viewing the personal information(Enter letter p)
Option 6: Set or get planning budget(Enter letter s)
Option 7: Quitting the program(Enter letter q)

> What option do you want. Enter a, u, d, v, p, or q : u
* Fully information in your personal budget program:
Index: 0.
* Expense in JANUARY includes:
Housing: 123.0
Utilities: 123.0
Food: 123.0
Transportation: 123.0
Medical: 123.0
Insurance: 123.0
Clothing: 123.0
Other: 123.0
.....Total Spent: 984.0

Index: 1.
* Expense in FEBRUARY includes:
Housing: 123.0
Utilities: 123.0
Food: 123.0
Transportation: 123.0
Medical: 123.0
Insurance: 123.0
Clothing: 123.0
Other: 123.0
.....Total Spent: 984.0

Line:380 Col:82 Code:59 Top:362 OVS|BLK
```

This is “u” option to update a new monthly expense. It will first show what existing expense that you then could update using the providing index in the display.

```
File Edit View Build Project Settings Tools Window Help
Java Files Sort By Name
/Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCSS112FinalProject.java Person.java

362 public static void viewingBudget(Budget budget, Scanner input) {
[ITCS3112FinalProject.java]

Compile Messages | JGRASP Messages | Run I/O | Interactions
End Clear Help

> What index of the expense that you want to update? 0
> What month do you want to add(Choose from 1 to 12, or 0 for ALLYEAR Planning Budget): 4
> How much do you spend for the housing: 123
> How much do you spend for the utilities: 123
> How much do you spend for the food: 123
> How much do you spend for the transportation: 123
> How much do you spend for the medical: 123
> How much do you spend for the insurance: 123
> How much do you spend for the clothing: 123
> How much do you spend for the other thing: 123

* You successfully updated this expense from your records.
Do you want to update another expense? Enter yes or no:
Here is your options to do with your budget program:
Option 1: Adding expenses(Enter letter a)
Option 2: Updating expenses(Enter letter u)
Option 3: Deleting expenses(Enter letter d)
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)
Option 5: Viewing the personal information(Enter letter p)
Option 6: Set or get planning budget(Enter letter s)
Option 7: Quitting the program(Enter letter q)

> What option do you want. Enter a, u, d, v, p, or q : [
```

Now, you successfully updated it.

The screenshot shows the jGRASP IDE interface. On the left, the Java Files panel displays four files: Budget.java, Expenses.java, ITC3112FinalProject.java\*, and Person.java. The central workspace shows the output of a running Java program. The program's output is as follows:

```
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: Set or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)  
  
► What option do you want. Enter a, u, d, v, p, or q : d  
  
► What index of the expense that you want to remove? 0  
* You successfully removed this expense to your records.  
  
Do you want to remove another expense? Enter yes or no:  
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: Set or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)  
  
► What option do you want. Enter a, u, d, v, p, or q : L
```

The status bar at the bottom indicates "Status: running user program".

Similarly with “d” option to deleted unwanted expense

This screenshot shows the JGRASP IDE interface. The left pane displays a file tree for a project named 'budgetProgram' containing files Budget.java, Expenses.java, ITCSS112FinalProject.java\*, and Person.java. The right pane shows a terminal window with the following interaction:

```
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: Set or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)  
► What option do you want. Enter a, u, d, v, p, or q : p  
* Your personal information:  
First Name: Quang, Last Name: Ho  
Date of Birth: 02/06/1990  
Phone Number: 704-492-1335  
Email: qho@uncc.edu  
Occupation: Fulltime Student  
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: Set or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)  
► What option do you want. Enter a, u, d, v, p, or q : _
```

This is “p” option to view your personal information

This screenshot shows the JGRASP IDE interface. The left pane displays a file tree for a project named 'budgetProgram' containing files Budget.java, Expenses.java, ITCSS112FinalProject.java\*, and Person.java. The right pane shows a terminal window with the following interaction:

```
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: Set or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)  
► What option do you want. Enter a, u, d, v, p, or q : s  
For Planning Budget  
To set it[enter s].  
To get it[enter g].  
► Your choice: g  
Here is your planning budget:  
* Expense in includes:  
Housing: 12345.0  
Utilities: 12345.0  
Food: 12345.0  
Transportation: 1235.0  
Medical: 12354.0  
Insurance: 12352.0  
Clothing: 12345.0  
Other: 21345.0  
.....  
Total Spent: 96666.0  
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: Set or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)
```

This is “s” option to set or get a new yearly planning budget

```

File Edit View Build Project Settings Tools Window Help
Java Files /Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCSS112FinalProject.java* Person.java
Compile Messages jGRASP Messages Run I/O Interactions
End Clear Help
Here is your options to do with your budget program:
Option 1: Adding expenses(Enter letter a)
Option 2: Updating expenses(Enter letter u)
Option 3: Deleting expenses(Enter letter d)
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)
Option 5: Viewing the personal information(Enter letter p)
Option 6: Set or get planning budget(Enter letter s)
Option 7: Quitting the program(Enter letter q)

► What option do you want. Enter a, u, d, v, p, or q : v

All options that you could view:
Option A: Viewing A Monthly Expense(Enter letter A)
Option B: Viewing Your Planning Budget(Enter letter B)
Option C: Viewing Entire Expenses(Enter letter C)
Option D: Viewing Your All Calculation in The Budget(Enter letter D)
Option Q: Quitting the view operation

► What do you want to view: a
* Fully information in your personal budget program:
Index: 0.
* Expense in FEBRUARY includes:
Housing: 123.0
Utilities: 123.0
Food: 123.0
Transportation: 123.0
Medical: 123.0
Insurance: 123.0
Clothing: 123.0
Other: 123.0
.....Total Spent: 984.0

► What index of the expense do you want to see?

```

Browse Find Debug Workbench Status: running user program Line:311 Col:48 Code:0 Top:311 OVS|BLK

This is “v” option to view all calculations, expenses data. Also, a menu is provided in this option to view specific information that you like with options “a, b, c, d”, and “q” for quitting the view.

```

File Edit View Build Project Settings Tools Window Help
Java Files /Users/qmmme/Desktop/budgetProgram
Budget.java Expenses.java ITCSS112FinalProject.java* Person.java
Compile Messages jGRASP Messages Run I/O Interactions
End Clear Help
► What index of the expense do you want to see? 0
* Your interesting expense details:
* Expense in FEBRUARY includes:
Housing: 123.0
Utilities: 123.0
Food: 123.0
Transportation: 123.0
Medical: 123.0
Insurance: 123.0
Clothing: 123.0
Other: 123.0
.....Total Spent: 984.0

All options that you could view:
Option A: Viewing A Monthly Expense(Enter letter A)
Option B: Viewing Your Planning Budget(Enter letter B)
Option C: Viewing Entire Expenses(Enter letter C)
Option D: Viewing Your All Calculation in The Budget(Enter letter D)
Option Q: Quitting the view operation

What do you want to view: Invalid input for your choice. Choose another option: ----

All options that you could view:
Option A: Viewing A Monthly Expense(Enter letter A)
Option B: Viewing Your Planning Budget(Enter letter B)
Option C: Viewing Entire Expenses(Enter letter C)
Option D: Viewing Your All Calculation in The Budget(Enter letter D)
Option Q: Quitting the view operation
► What do you want to view: 

```

Browse Find Debug Workbench Status: running user program Line:311 Col:48 Code:0 Top:311 OVS|BLK

File Edit View Build Project Settings Tools Window Help

Java Files Sort By Name

/Users/qmmme/Desktop/budgetProgram

Budget.java Expenses.java ITCSS112FinalProject.java\* Person.java

Compile Messages jGRASP Messages Run I/O Interactions

End Clear Help

All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quiting the view operation

► What do you want to view: b

\* Expense in includes:  
Housing: 12345.0  
Utilities: 12345.0  
Food: 12345.0  
Transportation: 1235.0  
Medical: 12354.0  
Insurance: 12352.0  
Clothing: 12345.0  
Other: 21345.0

.....  
Total Spent: 96666.0

All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quiting the view operation

► What do you want to view:

Status: running user program

Line:311 Col:48 Code:0 Top:311 OVS|BLK

File Edit View Build Project Settings Tools Window Help

Java Files Sort By Name

/Users/qmmme/Desktop/budgetProgram

Budget.java Expenses.java ITCSS112FinalProject.java\* Person.java

Compile Messages jGRASP Messages Run I/O Interactions

End Clear Help

All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quiting the view operation

► What do you want to view: c

\* Fully information in your personal budget proram:  
Index: 0.  
\* Expense in FEBRUARY includes:  
Housing: 123.0  
Utilities: 123.0  
Food: 123.0  
Transportation: 123.0  
Medical: 123.0  
Insurance: 123.0  
Clothing: 123.0  
Other: 123.0

.....  
Total Spent: 984.0

All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quiting the view operation

► What do you want to view: l

Status: running user program

Line:311 Col:48 Code:0 Top:311 OVS|BLK

The screenshot shows the jGRASP IDE interface with a Java project named "budgetProgram". The left pane displays the project structure with files: Budget.java, Expenses.java, ITC3112FinalProject.java\*, and Person.java. The right pane shows the output window for the file ITC3112FinalProject.java\*. The window title is "[C] ITC3112FinalProject.java \*". It contains the following text:

```
All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quitting the view operation  
► What do you want to view: d  
  
* Overall planning: 96666.0  
* Overall expenses: 984.0, Percentage Used: 1.02%.  
* Overall remain in the budget: 95682.0, Percentage Remain: 98.98%.  
* Available amount in your account: 43016.0, Percentage Available Money: 97.76%.  
  
All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quitting the view operation  
► What do you want to view:
```

The status bar at the bottom indicates "Status: running user program".

The screenshot shows the jGRASP IDE interface with the same Java project structure. The right pane output window for ITC3112FinalProject.java\* now displays:

```
All options that you could view:  
Option A: Viewing A Monthly Expense(Enter letter A)  
Option B: Viewing Your Planning Budget(Enter letter B)  
Option C: Viewing Entire Expenses(Enter letter C)  
Option D: Viewing Your All Calculation in The Budget(Enter letter D)  
Option Q: Quitting the view operation  
► What do you want to view: q  
You have finished view operations.  
Here is your options to do with your budget program:  
Option 1: Adding expenses(Enter letter a)  
Option 2: Updating expenses(Enter letter u)  
Option 3: Deleting expenses(Enter letter d)  
Option 4: Viewing expenses and system calculations based on your data (Enter letter v)  
Option 5: Viewing the personal information(Enter letter p)  
Option 6: See or get planning budget(Enter letter s)  
Option 7: Quitting the program(Enter letter q)  
  
► What option do you want. Enter a, u, d, v, p, or q : q  
Thank for using this personal budget program  
----jGRASP: operation complete.
```

The status bar at the bottom indicates "Status: running user program".

This is "q" option to end the program

