CH2120

Class 9

# Budget: Allocatable Arrays

## Code

### mainProgram.f08

**program** mainProgram

**implicit** **none**

**call** mainBudget()

**end** **program** mainProgram

### mainBudget.f08

**subroutine** mainBudget()

**implicit** **none**

**integer** numberOfCategories

**character**(*len* = 10), **dimension**(:), **allocatable** :: categories

**real**, **dimension**(:), **allocatable** :: amounts

**integer** categoryCounter

**write**(\*,\*) "Enter the number of categories:"

**read**(\*,\*) numberOfCategories

**allocate**(categories(numberOfCategories))

**allocate**(amounts(numberOfCategories))

**do** categoryCounter = 1, numberOfCategories

**write**(\*,\*) "Enter category #", categoryCounter

**read**(\*,\*) categories(categoryCounter)

**write**(\*,\*) "Enter amount"

**read**(\*,\*) amounts(categoryCounter)

**end** **do**

**write**(\*,\*)

**write**(\*,\*) "My Budget"

**write**(\*,\*) "-------------------------"

**do** categoryCounter = 1, numberOfCategories

**write**(\*,20) categories(categoryCounter), ": ", amounts(categoryCounter)

**end** **do**

**write**(\*,\*) "-------------------------"

20 **format**(a10, a2, f7.2)

**end** **subroutine** mainBudget

## Output

Enter the number of categories:

3

Enter category # 1

Groceries

Enter amount

5000

Enter category # 2

Books

Enter amount

1500

Enter category # 3

Eating Out

Enter amount

2000

My Budget

-------------------------

Groceries : 5000.00

Books : 1500.00

Eating : 2000.00

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# Budget: The if-then-else statements

## Code

### mainProgram.f08

**program** mainProgram

**implicit** **none**

**call** mainBudget()

**end** **program** mainProgram

### mainBudget.f08

**subroutine** mainBudget()

**implicit** **none**

**integer** numberOfCategories

**character**(*len* = 10), **dimension**(:), **allocatable** :: categories

**real**, **dimension**(:), **allocatable** :: amounts

**integer** categoryCounter

**do**

**write**(\*,\*) "Enter the number of categories:"

**read**(\*,\*) numberOfCategories

**if**(numberOfCategories <= 0) **then**

**write**(\*,\*) "-- Error: Number of categories must be positive. --"

**else**

**exit**

**end** **if**

**end** **do**

**allocate**(categories(numberOfCategories))

**allocate**(amounts(numberOfCategories))

**do** categoryCounter = 1, numberOfCategories

**write**(\*,\*) "Enter category #", categoryCounter

**read**(\*,\*) categories(categoryCounter)

**do**

**write**(\*,\*) "Enter amount"

**read**(\*,\*) amounts(categoryCounter)

**if**(amounts(categoryCounter) <= 0) **then**

**write**(\*,\*) "-- Error: Amount to be spent cannot be negative. --"

**else**

**exit**

**end** **if**

**end** **do**

**end** **do**

**write**(\*,\*)

**write**(\*,\*) "My Budget"

**write**(\*,\*) "-------------------------"

**do** categoryCounter = 1, numberOfCategories

**write**(\*,20) categories(categoryCounter), ": ", amounts(categoryCounter)

**end** **do**

**write**(\*,\*) "-------------------------"

20 **format**(a10, a2, f7.2)

**end** **subroutine** mainBudget

## Output

Enter the number of categories:

-3

-- Error: Number of categories must be positive. --

Enter the number of categories:

3

Enter category # 1

Groceries

Enter amount

5000

Enter category # 2

Books

Enter amount

-1500

-- Error: Amount to be spent cannot be negative. --

Enter amount

1500

Enter category # 3

Eating Out

Enter amount

2000

My Budget

-------------------------

Groceries : 5000.00

Books : 1500.00

Eating : 2000.00

-------------------------

# Budget: Calculating the total budgeted amount

## Code

### mainProgram.f08

**program** mainProgram

**implicit** **none**

**call** mainBudget()

**end** **program** mainProgram

### mainBudget.f08

**subroutine** mainBudget

**implicit** **none**

**real**, **external** :: sumOfArray

**character**(*len*=10), **dimension**(:), **allocatable** :: categories

**real**, **dimension**(:), **allocatable** :: amounts

**real** totalAmount

**integer** numberOfCategories

**integer** categoryCounter

**do**

**write**(\*,\*) "Enter number of categories in your budget:"

**read**(\*,\*) numberOfCategories

**if**(numberOfCategories <= 0) **then**

**write**(\*,\*) "-- Error: Number of categories should be positive --"

**else**

**exit**

**end** **if**

**end** **do**

**allocate**(categories(numberOfCategories))

**allocate**(amounts(numberOfCategories))

**do** categoryCounter = 1, numberOfCategories

**write**(\*,\*) "Enter category #", categoryCounter

**read**(\*,\*) categories(categoryCounter)

**do**

**write**(\*,\*) "Enter the amount to be budgeted for ", categories(categoryCounter)

**read**(\*,\*) amounts(categoryCounter)

**if**(amounts(categoryCounter) < 0) **then**

**write**(\*,\*) "-- Error: The amount to be spent cannot be less than zero."

**else**

**exit**

**end** **if**

**end** **do**

**end** **do**

totalAmount = sumOfArray(amounts, numberOfCategories)

**call** printBudget(categories, amounts, totalAmount, numberOfCategories)

**end** **subroutine** mainBudget

### sumOfArray.f08

**real** **function** sumOfArray(inputArray, sizeOfArray)

**implicit** **none**

**integer**, **intent**(in) :: sizeOfArray

**real**, **dimension**(sizeOfArray), **intent**(in) :: inputArray

**integer** elementCounter

sumOfArray = 0

**do** elementCounter = 1, sizeOfArray

sumOfArray = sumOfArray + inputArray(elementCounter)

**end** **do**

**end** **function** sumOfArray

### printBudget.f08

**subroutine** printBudget(categories, amounts, totalAmount, numberOfCategories)

**implicit** **none**

**integer**, **intent**(in) :: numberOfCategories

**character**(*len*=10), **dimension**(numberOfCategories), **intent**(in) :: categories

**real**, **dimension**(numberOfCategories), **intent**(in) :: amounts

**real**, **intent**(in) :: totalAmount

**integer** categoryCounter

**write**(\*,\*) "-------------------"

**write**(\*,\*) "My Budget"

**write**(\*,\*) "-------------------"

**do** categoryCounter = 1, numberOfCategories

**write**(\*,10) categories(categoryCounter), ": ", amounts(categoryCounter)

**end** **do**

**write**(\*,\*) "-------------------"

**write**(\*,20) "Total: ", totalAmount

**write**(\*,\*) "-------------------"

10 **format**(a10, a2, f8.2)

20 **format**(a12, f8.2)

**end** **subroutine** printBudget

## Output

Enter number of categories in your budget:

4

Enter category # 1

Groceries

Enter the amount to be budgeted for Groceries

2500

Enter category # 2

Petrol

Enter the amount to be budgeted for Petrol

3000

Enter category # 3

Books

Enter the amount to be budgeted for Books

1500

Enter category # 4

Eating Out

Enter the amount to be budgeted for Eating

2000

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My Budget

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Groceries : 2500.00

Petrol : 3000.00

Books : 1500.00

Eating : 2000.00

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Total: 9000.00

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