

# Memorization

## Test 1

Call the function twice and get the value from the cache

```
class MemorizeTest1 {
    public static void main(String argv[]) {
        int a;
        double b;
        String s;
        a = 19;
        b = 23.3;
        s = "prefect";
        SampleVariable v = new SampleVariable(91, 89.1);
        System.out.printf("\n----- First call Add and save result -----\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s, v));
        System.out.printf("\n----- Second call Add and found result -----
\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s, v));
    }
}
```

## Result

```
===== system under test
MemorizeTest1.main()

===== search started: 9/24/19 1:08 AM

===== MemorizeTest1:main =====
Input slots: [187, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

===== SampleVariable:<init> =====
Input slots: [356, 91, 1079395942, 1717986918, 0, 0, 0]

----- First call Add and save result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Add:add: Saving result 42 #
19 + 23 = 42!

----- Second call Add and found result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Found Cached Result: 42 #
19 + 23 = 42!
```

## Test 2

Call the method with different inputs and save those results

```
class MemorizeTest2 {
    public static void main(String argv[]) {
        int a;
        double b;
        String s;
        a = 19;
        b = 23.3;
        s = "prefect";
        SampleVariable v = new SampleVariable(91, 89.1);
        System.out.printf("\n----- First call Add and save result -----\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s, v));
        System.out.printf("\n----- Call Add with different input and save
result -----\n");
        b = 50.1;
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s, v));
        System.out.printf("\n----- Second call Add and found result -----
\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s, v));
        b = 23.3;
        System.out.printf("\n----- Second call Add and found result -----
\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s, v));
    }
}
```

**Result**

```

MemorizeTest2.main()

===== search started: 9/24/19 1:10 AM

===== MemorizeTest2:main =====
Input slots: [187, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

===== SampleVariable:<init> =====
Input slots: [356, 91, 1079395942, 1717986918, 0, 0, 0]

----- First call Add and save result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Add:add: Saving result 42 #
19 + 23 = 42!

----- Call Add with different input and save result -----

===== Add:add =====
Input slots: [19, 1078529228, -858993459, 351, 356, 0, 0, 0]
# Add:add: Saving result 69 #
19 + 50 = 69!

----- Second call Add and found result -----

===== Add:add =====
Input slots: [19, 1078529228, -858993459, 351, 356, 0, 0, 0]
# Found Cached Result: 69 #
19 + 50 = 69!

----- Second call Add and found result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Found Cached Result: 42 #
19 + 23 = 42!

```

## Test 3

Call the method with different objects and save those results

```

class MemorizeTest3 {
    public static void main(String argv[]) {
        int a;
        double b;
        String s;
        a = 19;
        b = 23.3;
        s = "prefect";
        SampleVariable v1 = new SampleVariable(91, 89.1);
        System.out.printf("\n----- First call Add and save result -----\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s,
v1));
    }
}

```

```

        System.out.printf("\n----- Call Add with different input and save
result -----\\n");
        SampleVariable v2 = new SampleVariable(91, 100.1);
        System.out.printf("%d + %d = %d!\\n", a, (int) b, Add.add(a, b, s,
v2));
        System.out.printf("\n----- Second call Add and found result -----
\\n");
        System.out.printf("%d + %d = %d!\\n", a, (int) b, Add.add(a, b, s,
v1));
        System.out.printf("\n----- Second call Add and found result -----
\\n");
        System.out.printf("%d + %d = %d!\\n", a, (int) b, Add.add(a, b, s,
v2));
    }
}

```

## Result

```

MemorizeTest3.main()

===== search started: 9/24/19 1:12 AM

===== MemorizeTest3:main =====
Input slots: [187, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

===== SampleVariable:<init> =====
Input slots: [356, 91, 1079395942, 1717986918, 0, 0, 0]

----- First call Add and save result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Add:add: Saving result 42 #
19 + 23 = 42!

----- Call Add with different input and save result -----

===== SampleVariable:<init> =====
Input slots: [632, 91, 1079576166, 1717986918, 0, 0, 0]

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 632, 0, 0, 0]
# Add:add: Saving result 42 #
19 + 23 = 42!

----- Second call Add and found result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Found Cached Result: 42 #
19 + 23 = 42!

----- Second call Add and found result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 632, 0, 0, 0]
# Found Cached Result: 42 #
19 + 23 = 42!

```

## Test 4

Update the object without hitting the caching

```

class MemorizeTest4 {
    public static void main(String argv[]) {
        int a;
        double b;
        String s;
        a = 19;
        b = 23.3;
        s = "prefect";
        SampleVariable v1 = new SampleVariable(91, 89.1);
        System.out.printf("\n----- First call Add and save result -----\\n");
    }
}

```

```

        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s,
v1));
        System.out.printf("\n----- Second call Add and found result -----
\n");
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s,
v1));
        System.out.printf("\n----- Update the object without hitting the
caching ----- \n");
        v1.a = 9;
        System.out.printf("%d + %d = %d!\n", a, (int) b, Add.add(a, b, s,
v1));
    }
}

```

## Result

```

MemorizeTest4.main()

===== search started: 9/24/19 1:15 AM

===== MemorizeTest4:main =====
Input slots: [187, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

===== SampleVariable:<init> =====
Input slots: [356, 91, 1079395942, 1717986918, 0, 0, 0]

----- First call Add and save result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Add:add: Saving result 42 #
19 + 23 = 42!

----- Second call Add and found result -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
# Found Cached Result: 42 #
19 + 23 = 42!

----- Update the object without hitting the caching -----

===== Add:add =====
Input slots: [19, 1077365964, -858993459, 351, 356, 0, 0, 0]
Cache doesn't match: 9 91
19 + 23 = 42!

```