

3.0 - Week 3 - Workshop (MA)

Learning Objectives

- Coding simple MIPS programs involving decisions and iterations.
- Learning how to use Arrays in MIPS.

Week 3 Padlet Discussion Board link: <https://monashmalaysia.padlet.org/fermi/2022week3>

If-elif-else in MIPS

Consider the following Python code:

```
secret = 42
guess = int(input("Enter guess: "))
diff = secret - guess

if diff < 0:
    print("Too high")
elif diff == 0:
    print("Good guess!")
else:
    print("Too low")
```

Faithfully translate the above code into a properly commented MIPS program using the file provided.

For loops in MIPS

Consider the following Python code:

```
previous = -1
current = 1

size = int(input("Input size: "))

for i in range(0, size, 1):
    current = current + previous
    previous = current - previous
    print(current, end=' ')
print()
```

We have done the work of translating the `for` loop into a `while` loop below:

```
previous = -1
current = 1

size = int(input("Input size: "))

i = 0
while i < size:
    current = current + previous
    previous = current - previous
    print(current, end=' ')
    i += 1
print()
```

Faithfully translate the above code (with the `while` loop) into a properly commented MIPS program using the file provided.

Arrays in MIPS

Consider the following Python code:

```
array = [0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181,]
size = 20

first = int(input("Input first index (inclusive): "))
last = int(input("Input last index (inclusive): "))
#assume last < len(array)
#assume first <= last

subsize = last-first+1
subarray = [0] * subsize

for i in range (0, subsize):
    temp = array[first+i]
    subarray[i] = temp
    print(subarray[i], end= ' ')

print()
```

Note how the complexity of creating a subarray of size k from an array of size n with this code is $O(k)$ (so it is independent of n).

Faithfully translate the above code (with the `while` loop) into a properly commented MIPS program using the file provided.

If you are struggling to understand the memory and addressing aspects of this question, consider using MARS's GUI and debugger locally on your computer.

Feedback Form

Weekly Workshop Feedback Form

Question 1

I am enrolled in:

☐ 🇦🇺 Australia

☐ 🇲🇾 Malaysia

Question 2

What needs improvement?

No response

Question 3

What worked best?

No response

Question 4

How engaged were you by the workshop?

☐ 🇸🇦 Very engaged

☐ 🇸🇦 Engaged

☐ 😞 Not impressed

☐ 😞👁️👁️👁️ Lost