



SAGE Midterm Report

Spring 2021
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Overview

- Sprint 1: Environment setup & Ramp-up
- Sprint 2: Finalizing condition set & Puzzle Authoring
- Sprint 3: User-centered design drafts

Environment setup



Finalized condition set

- i. 6 per condition
 - 1. 1) PPP
 - 2. 2) PPPd
 - 3. 3) ScratchIE
 - 4. 4) ScratchIEd
 - 5. 5) PPPo
 - 6. 6) PPPod
 - 7. 7) ScratchIEo
 - 8. 8) ScratchIEod
 - 9. 8) CPP
 - 10. 9) CPPd
 - 11. 10) CPPie
 - 12. 11) CPPied
- ii. 1 per condition
 - 1. 12) PPP, PPPd, PPPo, PPPod, CPP, CPPd
 - 2. 13) ScratchIE, ScratchIEd, ScratchIEo, ScratchIEod, CPPie, CPPied
 - 3. 14) PPP, PPPo, ScratchIE, ScratchIEo, CPP, CPPie
 - 4. 15) PPPd, PPPod, ScratchIEd, ScratchIEod, CPPd, CPPied
- iii. Control (sequences)
 - 1. 16) PPPc



Puzzle Authoring Considerations

- Author puzzle programs with motivating scenarios
- Author puzzle programs with memorable segments
- Provide a challenge without being tricky
- Leave the users with a positive impression



Preliminary work: Bank account

no loop:

```
interest = balance * rate / 100;
```

```
balance = balance + interest;
```

for loop:

see the interest rate over the course of a year:

```
for i in range(1,13):
```

```
    interest = balance * rate / 100;
```

```
    balance = balance + interest;
```

nested for loop:

see the interest rate over the course of several years:

```
for i in range(years):
```

```
    balance += 2000
```

```
    for i in range(1,13):
```

```
        interest = balance * rate / 100;
```

```
        balance = balance + interest;
```

while loop:

has bank account reached a particular balance?

```
while (balance < targetBalance)
```

```
{
```

```
    year++;
```

```
    double interest = balance * rate / 100;
```

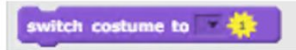
```
    balance = balance + interest;
```

```
}
```

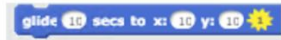
Game 1: Warmup



Looping: This block allows the user to repeat the blocks inside of it x number of times, where x is the value passed in next to the “repeat” statement.



Looks: This block causes the sprite to switch from one costume to another. The sprite in the warm-up exercise has two costumes that reflect two states: upright position, and the jumping jack position.



Motion: This block causes the sprite to slowly glide to the specified position.

Let's start with a few jumping jacks to get warmed up:

- Make the sprite glide 1 seconds up 20 units, change to the jumping jack position, and glide back down 1 second and change to the upright position to complete a jumping jack.

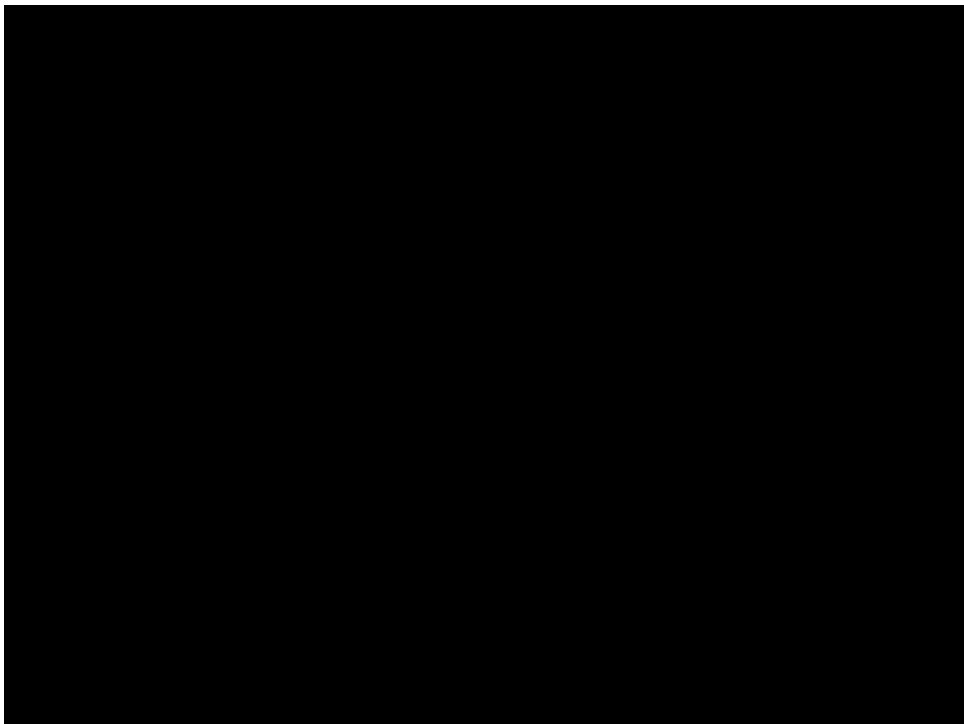
Finish 3 jumping jacks to complete this warmup!

Blocks needed: 5

Solution:



Instructions for looping concept warm-up



Sample puzzle: warmup

Preliminary user testing



Further work

- Pretest and posttest focused on CT in addition to programming
 - Identify puzzle in which looping useful (two types, 1 text, 1 picture)
- Identify additional and/or modified survey content
- Create study guide in qualtrics
- Iterating on Field Study 1 feedback and resulting guidelines for FS3