ФАКУЛЬТЕТ ПРОГРАММНОЙ ИНЖЕНЕРИИ И КОМПЬЮТЕРНОЙ ТЕХНИКИ

ЛАБОРАТОРНАЯ РАБОТА №2

по дисциплине

"МЕТОДЫ И СРЕДСТВА ПРОГРАММНОЙ ИНЖЕНЕРИИ"

Вариант: 370572.

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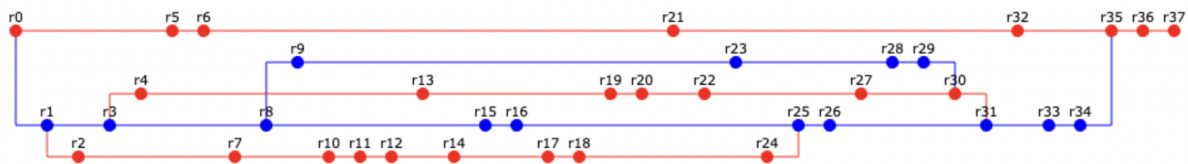**г. Санкт-Петербург, 2023**

Содержание

Задание

Сконфигурировать в своём домашнем каталоге репозитории svn и git и загрузить в них начальную ревизию файлов с исходными кодами (в соответствии с выданным вариантом).

Воспроизвести последовательность команд для систем контроля версий svn и git, осуществляющих операции над исходным кодом, приведённые на блок-схеме.

При составлении последовательности команд необходимо учитывать следующие условия:

- Цвет элементов схемы указывает на пользователя, совершившего действие (красный - первый, синий - второй).
- Цифры над узлами - номер ревизии. Ревизии создаются последовательно.
- Необходимо разрешать конфликты между версиями, если они возникают.

GIT

Файл `first_user`:

```
cat > first_user
git config --global user.name "Matthew"
git config --global user.email matthewthebest@gmail.com
```

Файл `second_user`:

```
cat > second_user
git config --global user.name "GREG"
git config --global user.email gregnotnazi@gmail.com
```

Скрипт:

```
# Инициализируем
git init git_rep
cd git_rep

# r0
sh ../first_user
I=0 && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r1
sh ../second_user
let "I += 1" && cp -r ../commits/commit$I/* ./
git checkout -b fork_r0
git add *
git commit -m "r$I"

# r2
sh ../first_user
git checkout -b fork_r1
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r3
sh ../second_user
git checkout fork_r0
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r4
sh ../first_user
git checkout -b fork_r3
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r5
git checkout main
```

```
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r6
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r7
git checkout fork_r1
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r8
sh ../second_user
git checkout fork_r0
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r9
git checkout -b fork_r8
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r10
sh ../first_user
git checkout fork_r1
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r11
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r12
```

```
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r13
git checkout fork_r3
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r14
git checkout fork_r1
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r15
sh ../second_user
git checkout fork_r0
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r16
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r17
sh ../first_user
git checkout fork_r1
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r18
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r19
```

```
git checkout fork_r3
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r20
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r21
git checkout main
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r22
git checkout fork_r3
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r23
sh ../second_user
git checkout fork_r8
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r24
sh ../first_user
git checkout fork_r1
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r25
sh ../second_user
git checkout fork_r0
git merge fork_r1 -m "merge fork_r1 with fork_r0"
```

```
# Resolve conflicts
nano "*"

let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r26
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r27
sh ../first_user
git checkout fork_r3
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r28
sh ../second_user
git checkout fork_r8
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r29
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"

# r30
sh ../first_user
git checkout fork_r3
git merge fork_r8 -m "Merge fork_r8 with fork_r3"

# Resolve conflicts (copy right version)

let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"
```

```
# r31
sh ../second_user
git checkout fork_r0
git merge fork_r3 -m "Merge fork_r3 with fork_r0"

# Resolve conflicts (copy right version)

let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r32
sh ../first_user
git checkout main
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r33
sh ../second_user
git checkout fork_r0
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r34
let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"


# r35
sh ../first_user
git checkout main
git merge fork_r0 -m "Merge fork_r0 with main"

# Resolve conflicts (copy right version)

let "I += 1" && cp -r ../commits/commit$I/* ./
git add *
git commit -m "r$I"
```

SVN

```
##  lib
# head.sh
set -e

cd $(dirname -- "$0"; )


VSC_NAME="svn"
REPO_NAME="$VSC_NAME-repository"
SCRIPT="."

# dsl.sh
TAG="[svn:$TARGET]"


log() {
  echo "$TAG $1"
}

remove() {
  rm -rf $1
  log "removed $1"
}

copy() {
  cp "$1" "$2"
  log "copied $1 to $2"
}

call() {
  bash "$SCRIPT/$1.sh"
}

begin() {
  log "started $TARGET"
}

end() {
```

```
  log "finished $TARGET"
}

enter() {
  SRC=../../../commits/$COMMIT
  cd history/$REPO_NAME/$BRANCH
  svn update
}

edit() {
  copy "$SRC/$1" "$1"
}

edit_all() {
  cp $SRC/* .
}




delete() {
  remove $1
}

branch() {
  # $1 - source branch name, e.g. "trunk" or "branches/my-branch"
  # $2 - target branch name, e.g. "my-branch"
  # $3 - message

  svn copy \
    file://$HOME/.svnrepos/$REPO_NAME/$1 \
    file://$HOME/.svnrepos/$REPO_NAME/branches/$2 \
    -m "$3"
  log $3

  cd commits/$REPO_NAME
  svn checkout file://$HOME/.svnrepos/$REPO_NAME/branches/$2 $2
  log "checkout to branch $2"
  cd ../..
}

# run.sh
```

```bash
#!/bin/bash

set -e


bash ./main.sh

# main.sh

#!/bin/bash

. ./lib/head.sh --source-only
TARGET="main"
. ./lib/dsl.sh --source-only

begin
  log "pwd: $(pwd)"

  call clean
  call init
  call r0
  call r1
  call r2
  call r3
  call r4
  call r5
  call r6
  call r7
  call r8
  call r9
  call r10
  call r11
  call r12
  call r13
  call r14
  call r15
  call r16
  call r17
  call r18
  call r19
```

```
    call r20
    call r21
    call r22
    call r23
    call r24
    call r25
    call r26
    call r27
    call r28
    call r29
    call r30
    call r31
    call r32
    call r33
    call r34
    call r35

end

# init.sh

#!/bin/bash

. ./lib/head.sh --source-only
TARGET="init"
. ./lib/dsl.sh --source-only

begin
  log "repo is $REPO_NAME"

  mkdir -p ~/.svnrepos/
  svnadmin create ~/.svnrepos/$REPO_NAME

  log "repository created"

  svn mkdir -m "Create repository structure." \
    file://$HOME/.svnrepos/$REPO_NAME/trunk \
    file://$HOME/.svnrepos/$REPO_NAME/branches \
    file://$HOME/.svnrepos/$REPO_NAME/tags

  log "repository initialized"
```

```
  mkdir -p commits/$REPO_NAME
  cd commits/$REPO_NAME

  svn checkout file://$HOME/.svnrepos/$REPO_NAME/trunk trunk
  cd trunk

  echo "hello, world!" > file.txt
  svn add --force .
  svn commit -m "Initial import."
  svn update
end
```

r0 (first commit)

```
#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit0"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all

  svn commit -m "$TAG r0" --username $USER
end
```

r1 (branching)
```
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit1"
TARGET="$BRANCH:$COMMIT"
```

```
    . ./lib/dsl.sh --source-only

begin
    branch trunk "$BRANCH" "forking from r0"
    enter
    edit_all

    svn commit -m "$TAG r1" --username $USER
    log "commited changes to $BRANCH"

end
# r2

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit2"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
    branch "branches/branch1" "$BRANCH" "forking from r1"
    enter
    edit_all

    svn commit -m "$TAG r2" --username $USER
    log "commited changes to $BRANCH"

end

# r3
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit3"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only
```

```
begin
  enter
  edit_all
  svn commit -m "$TAG r3" --username $USER
end

# r4

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch3"
COMMIT="commit4"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  branch "branches/branch1" "$BRANCH" "forking from r3"
  enter
  edit_all
  svn commit -m "$TAG r4" --username $USER
  log "commited changes to $BRANCH"

end

# r5

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit5"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
```

```bash
    svn commit -m "$TAG r5" --username $USER
end


# r6
#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit6"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r6" --username $USER
end

# r7
#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit7"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r7" --username $USER
end

# r8
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
```

```bash
COMMIT="commit8"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r8" --username $USER
end

# r9
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch4"
COMMIT="commit9"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  branch "branches/branch1" "$BRANCH" "forking from r8"
  enter
  edit_all
  svn commit -m "$TAG r9" --username $USER
  log "commited changes to $BRANCH"

end

# r10

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit10"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
```

```
    enter
    edit_all
    svn commit -m "$TAG r10" --username $USER
end


# r11


#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit11"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
    enter
    edit_all
    svn commit -m "$TAG r11" --username $USER
end


# r12


#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit12"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
    enter
    edit_all
    svn commit -m "$TAG r12" --username $USER
end


# r13
```

```bash
#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch3"
COMMIT="commit13"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r13" --username $USER
end
```

r14

```bash
#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit14"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r14" --username $USER
end
```

r15

```bash
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit15"
TARGET="$BRANCH:$COMMIT"
```

```
  . ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r15" --username $USER
end

# r16

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit16"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r16" --username $USER
end

# r17

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit17"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r17" --username $USER
end
```

```bash
# r18

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit18"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r18" --username $USER
end


# r19

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch3"
COMMIT="commit19"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r19" --username $USER
end

# r20

#!/bin/bash

. ./lib/head.sh --source-only
```

```
USER="Matthew"
BRANCH="branch3"
COMMIT="commit20"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r20" --username $USER
end

# r21

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit21"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r21" --username $USER
end

# r22

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch3"
COMMIT="commit22"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
```

```bash
    enter
    edit_all
    svn commit -m "$TAG r22" --username $USER
end


# r23

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch4"
COMMIT="commit23"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
    enter
    edit_all
    svn commit -m "$TAG r23" --username $USER
end


# r24

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch2"
COMMIT="commit24"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
    enter
    edit_all
    svn commit -m "$TAG r24" --username $USER
end


# r25
```

```bash
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit25"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn merge ^/branches/branch2
  log "merged branch2 into $BRANCH"

  svn commit -m "$TAG r25" --username $USER
end
```

r26

```bash
#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit26"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r26" --username $USER
end
```

r27

```bash
#!/bin/bash
```

```bash
. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch3"
COMMIT="commit27"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r27" --username $USER
end

# r28

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch4"
COMMIT="commit28"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r28" --username $USER
end

# r29

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch4"
COMMIT="commit29"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only
```

```
begin
  enter
  edit_all
  svn commit -m "$TAG r29" --username $USER
end


# r30

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="branch3"
COMMIT="commit30"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn merge ^/branches/branch4
  log "merged branch4 into $BRANCH"

  svn commit -m "$TAG r30" --username $USER
end

# r31

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit31"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  svn merge  --allow-mixed-revisions ^/branches/branch3
```

```
    edit_all
    log "merged branch3 into $BRANCH"


    svn commit -m "$TAG r31" --username $USER
end


# r32

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit32"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r32" --username $USER
end



# r33

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit33"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r33" --username $USER
end
```

```bash
# r34

#!/bin/bash

. ./lib/head.sh --source-only
USER="GREG"
BRANCH="branch1"
COMMIT="commit34"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r34" --username $USER
end

# r35

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit35"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn merge ^/branches/branch1
  log "merged branch1 into $BRANCH"

  svn commit -m "$TAG r35" --username $USER
end

# r36

#!/bin/bash
```

```
. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit36"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r36" --username $USER
end

# r37.sh (last commit)

#!/bin/bash

. ./lib/head.sh --source-only
USER="Matthew"
BRANCH="trunk"
COMMIT="commit37"
TARGET="$BRANCH:$COMMIT"
. ./lib/dsl.sh --source-only

begin
  enter
  edit_all
  svn commit -m "$TAG r37" --username $USER
end
```

Выводы

В результате выполнения этой лабораторной работы мы научились пользоваться различными системами контроля версий, такими как git и svn. Очень познавательно.