Dublin City University
School of Computing
ETHICS COMMITTEE

NOTIFICATION FORM FOR LOW-RISK PROJECTS AT UNDERGRADUATE OR TAUGHT MASTERS LEVELS

Application Number:			

Please read the following information carefully before completing your application. Failure to adhere to these guidelines will make your submission ineligible for review.

- **Download this form**
- **Completed applications must be uploaded to your School of Computing GitLab repo, and must be located in "`docs/ethics.pdf`".**
- **Your supervisor will be notified automatically and must approve your approach initially.**
- **The application should consist of one electronic file (PDF) only.** The completed application must include this form and also must incorporate all supplementary documentation, especially that being given to the proposed participants e.g consent forms, plain English language statement. It must be proofread and spell-checked before submission**.**
- **All sections of the application form must be answered as instructed and within the word limits given.**

Applications which do not adhere to all of these requirements will not be accepted for review and will require resubmission

Applications must be completed on this form; answers in the form of attachments will not be accepted, except where indicated. No hard copy applications will be accepted. **The project must not commence until written approval has been received from the School of Computing Ethics Committee.**

PROJECT TITLE	Music Analysis Tool
PRINCIPAL INVESTIGATOR(S) *The named Principal Investigator is the person with primary responsibility for the research project. In the case of Taught Masters projects and undergraduate projects the supervisor is the Principal Investigator.*	Dr. Donal Fitzpatrick
START AND END DATE	30/10/2018 25/05/2019
LEVEL OF RISK *Please indicate whether this project requires more than a notification Justification for your choice is required under section 3.1*	Notification

Please confirm that <u>all</u> supplementary information is included in your application (in electronic copy). If questionnaire or interview questions are submitted in draft form, please indicate this by putting (draft) after YES. A copy of the final documentation must be submitted for final approval when available.

	My application has been collated as one electronic file which includes the following documentation:	INCLUDED (mark as YES)	NOT APPLICABLE (mark as N/A)
	Bibliography		N/A
	Recruitment advertisement		N/A
	Plain language statement/Information statement	**YES**	
	Informed consent form	**YES**	
	Personal Data Security Schedule https://www.dcu.ie/sites/default/files/info/3._blank_data_security_schedule.xls		N/A
	Evidence of external approvals related to the research		N/A
	Questionnaire/Survey	**YES**	
	Interview/Focus Group Questions		N/A
	Debriefing material		N/A
	Other (e.g. local government approval)		N/A

Please note:

1. Any amendments to the original approved proposal must receive prior SCEC approval.
2. As a condition of approval investigators are required to document and report immediately to SCEC any adverse events, any issues which might negatively impact on the conduct of the research and/or any complaint from a participant relating to their participation in the study

1. ADMINISTRATIVE DETAILS

Project Type (select one): Undergraduate Project – Final Year
Undergraduate Project – non-final Year
Taught Masters (Practicum)
(projects at other levels, e.g. PhD or research Masters, should be approved by the University's REC if necessary)

1.1 INVESTIGATOR CONTACT DETAILS

PRINCIPAL INVESTIGATOR(S): *Your supervisor and other academic staff who are assisting, it should be clear who is the person who is carrying out the research procedures.*

NAME	*SCHOOL/UNIT*	*EMAIL*
Dr Donal Fitzpatric	School of computing	donal.fitzpatrick@dcu.ie

OTHER INVESTIGATORS (STUDENT(S):

NAME	*SCHOOL/UNIT*	*EMAIL*
Patrick Ferry	School of computing	patrick.ferry2@mail.dcu.ie

1.2 WILL THE RESEARCH BE UNDERTAKEN ON-SITE AT A Dublin City University CAMPUS ?

YES or NO
YES

(If NO, state details of the off-campus location – provide details of the approval to gain access to that location in section 2.7.)

1.3 IS THIS PROTOCOL BEING SUBMITTED TO ANOTHER ETHICS COMMITTEE, OR HAS IT BEEN PREVIOUSLY SUBMITTED TO AN ETHICS COMMITTEE?

YES or NO
NO

(If YES, please provide details and attach copies of approval(s) received etc.)

DECLARATION BY PRINCIPAL INVESTIGATOR(S)

The information contained herein is, to the best of my knowledge and belief, accurate. I have read the University's current research ethics guidelines, and accept responsibility for the conduct of the procedures set out in the attached application in accordance with the form guidelines, the SCEC guidelines (https://www.dcu.ie/researchsupport/researchethics.shtml), the University's policy on Conflict of Interest, Code of Good Research Practice and any other condition laid down by the Dublin City University Research Ethics Committee. I have attempted to identify all risks related to the research that may arise in conducting this research and acknowledge my obligations and the rights of the participants.

If there exists any affiliation or financial interest for researcher(s) in this research or its outcomes or any other circumstances which might represent a perceived, potential or actual conflict of interest this should be declared in accordance with Dublin City University policy on Conflicts of Interest.

I and my co-investigators or supporting staff have the appropriate qualifications, experience and facilities to conduct the research set out in the attached application and to deal with any emergencies and contingencies related to the research that may arise.

Electronic Signature(s):

Principal investigator(s): Dr Donal Fitzpatrick
_____Patrick Ferry_____

Print Name(s) here: Donal Fitzpatrick_____Patrick Ferry_____
Date: 02/05/2019

2. PROJECT OUTLINE

2.1 LAY DESCRIPTION *(Max. 300 words)*

Please outline, in terms that any non-expert would understand, what your research project is about, including what participants will be required to do. Please explain any technical terms or discipline-specific phrases.

My project is a webapp that transcribes wav files to midi files by analyses the frequencies. Participants would be asked to upload a file through the webapp and rate the output. The users will use a test account.

2.2 AIMS OF AND JUSTIFICATION FOR THE RESEARCH *(Max. 400 words)*

State the aims and significance of the project. Where relevant, state the specific hypothesis to be tested. Please provide a brief description of background research, a justification as to why this research project should proceed in that context and an explanation of any expected benefits to the community. NB – all references cited should be listed in an attached bibliography.

The aims would be to test the functionality of the front end, and to evaluate the accuracy of the output.

2.3 DESCRIBE THE METHODOLOGY BEING USED TO ACHIEVE YOUR STATED AIMS

Provide an outline of the proposed method and state who is doing which task – include details of data collection techniques, the tasks participants will be asked to do, the estimated time commitment involved, and how data will be analysed. If the project includes any procedure which is beyond already established and accepted techniques please include a description of it. There should be enough detail provided to facilitate ethical review, but applicants are encouraged to keep it as succinct as possible.

Participants will be asked to choose a song and use the interface for the tool to transcribe it into midi. They will then be asked to listen to as much of the output file as they would like and complete a questionnaire. Sample questions are attached below. Research will take place in the DCU computing labs and participants will all use the same machine for testing.

2.4 PARTICIPANT PROFILE

Provide the number, age range and source of participants. Please provide a justification of your proposed sample size. Please provide a justification for selecting a specific gender, age, or any other group if this is done in your project.

12 users, no specified age range.

2.4(a) PARTICIPANT VULNERABILITY

Are some or all of participants vulnerable in any way? (e.g by virtue of the group they belong to, people who have undergone traumatic or adverse emotional events, people with diminished cognitive ability, power relations between researchers and participants etc.)? If they are, state what this vulnerability (or vulnerabilities) is and justify why this research is being done with such participants.

No

2.4(b) CHILD PARTICIPANTS (anyone under 18 years old)

*If your participants include children, you **must** confirm that you are in compliance with the research specific guidelines as detailed in "Keeping Children Safe - Policies and Procedures supporting Child Protection at DCU" - available at:*

https://www4.dcu.ie/sites/default/files/policy/157%20-%20child_protection_handbook_rev1%282%29%281%29.pdf

Please indicate your compliance with the following guidelines:	**Mark here**
We confirm that we have read and agree to act in accordance with the DCU Child Protection policy and procedures	**N/a**
We confirm that we have put in place safeguards for the children participating in the research	**N/a**
We confirm that we have supports in place for children who may disclose current or historical abuse (whether or not this is the focus of the research)	**N/a**

2.5 EXPLAIN HOW PARTICIPANTS ARE TO BE RECRUITED

Please provide specific details as to how you will be recruiting participants. How will people be informed that you are doing this research? How will they be approached and asked if they are willing to participate? If you are mailing or phoning people, please explain how you have obtained their names and contact details. If a recruitment advertisement is to be used, please ensure you attach a copy to this application.

Participants will be reached out to through a forum post, asking if they would like to participate. Some others may be reached out to through email, who's emails I have obtained through working on previous projects with them.

2.6 PLEASE EXPLAIN WHEN, HOW, WHERE, AND TO WHOM RESULTS WILL BE DISSEMINATED, INCLUDING WHETHER PARTICIPANTS WILL BE PROVIDED WITH ANY INFORMATION AS TO THE FINDINGS OR OUTCOMES OF THE PROJECT?

Results will be disseminated, in anonymized form, to the examiner

2.7 ARE OTHER APPROVALS REQUIRED TO GAIN ACCESS TO ANOTHER LOCATION, ORGANISATION ETC.?

YES or NO
NO

(If YES, please specify from whom and attach a copy of the approval documentation. If this is not yet available, please explain when this will be obtained.)

2.8 HAS A SIMILAR PROPOSAL BEEN PREVIOUSLY APPROVED BY THE DCU SCEC?

YES or NO
NO

(If YES, please state both the REC Application Number and Project Title)

3. RISK AND RISK MANAGEMENT

3.1 JUSTIFICATION OF STATED LEVEL OF RISK TO RESEARCH PARTICIPANTS

You must provide a justification for the stated level of risk, as indicated on the cover page of your application. Note that the level of risk may be influenced by the vulnerability of the research group, the methods employed and the nature of the research itself. For further information on risk levels, please refer to the Levels of Review information on the website: https://www.dcu.ie/researchsupport/researchethics.shtml

The survey will be anonymous and I will be only observing.

3.2 DOES THE RESEARCH INVOLVE:

	YES or NO
● use of a questionnaire? (attach copy)?	YES
● interviews (attach interview questions)?	NO
● observation of participants without their knowledge?	NO
● participant observation (provide details in section 2)?	YES
● audio- or video-taping interviewees or events?	NO
● access to personal and/or confidential data (including student, patient or client data) without the participant's specific consent?	NO
● administration of any stimuli, tasks, investigations or procedures which may be experienced by participants as physically or mentally painful, stressful or unpleasant during or after the research process?	NO
● performance of any acts which might diminish the self-esteem of participants or cause them to experience embarrassment, regret or depression?	NO
● investigation of participants involved in illegal activities?	NO
● procedures that involve deception of participants?	NO
● administration of any substance or agent?	NO
● use of non-treatment of placebo control conditions?	NO
● collection of body tissues or fluid samples?	NO
● collection and/or testing of DNA samples?	NO
● participation in a clinical trial?	NO
● administration of ionising radiation to participants?	NO

3.3 POTENTIAL RISKS TO PARTICIPANTS AND RISK MANAGEMENT PROCEDURES

Identify, as far as possible, all potential risks to participants (physical, psychological, social, legal, economic, etc.), associated with the proposed research. Please explain what risk management procedures will be put in place to minimise these risks.

None.

3.4 ARE THERE LIKELY TO BE ANY BENEFITS (DIRECT OR INDIRECT) TO PARTICIPANTS FROM THIS RESEARCH?

YES or NO
NO

(If YES, provide details.)

3.5 ARE THERE ANY SPECIFIC RISKS TO RESEARCHERS?

Examples include use of dangerous materials, asking certain types of questions, research being undertaken in certain locations, researchers working alone in isolated areas, etc.

YES or NO
NO

(If YES, please describe and explain what risk management procedures will be put in place to minimise these risks.)

3.6 DEALING WITH ADVERSE/UNEXPECTED OUTCOMES

Please describe what measures/protocols you have put in place in the event that there are any unexpected outcomes or adverse effects to participants arising from involvement in the project.

The monitored by the Principal Investigator, who has extensive experience in conducting this type of user-based study

3.7 HOW WILL THE CONDUCT OF THE PROJECT BE MONITORED?

Please explain how the principal investigator will monitor the conduct of the project (especially where several people are involved in recruiting or interviewing, administering procedures, etc.) to ensure that it conforms with the procedures set out in this application. In the case of student projects please give details of how the supervisor(s) will monitor the conduct of the project.

The principal investigator has over 20 years of experience in the conduct of this type of research. It will be monitored to ensure strict adherence to all ethical guidelines which apply to research of this type

3.8 SUPPORT FOR PARTICIPANTS

Depending on risks to participants you may need to consider having additional support for participants during/after the study. Consider whether your project would require additional support, e.g., external counselling available to participants. Please advise what support will be available.

N/a

3.9 DO YOU PROPOSE TO OFFER PAYMENTS OR INCENTIVES TO PARTICIPANTS?

YES or NO
NO

(If YES, please provide further details.)

3.10 DO ANY OF THE RESEARCHERS ON THIS PROJECT HAVE A PERSONAL, PHILOSOPHICAL, FINANCIAL OR COMMERCIAL INTEREST IN ITS OUTCOME THAT MIGHT INFLUENCE THE INTEGRITY OF THE RESEARCH, OR BIAS THE CONDUCT OR REPORTING OF THE RESEARCH, OR UNDULY DELAY OR OTHERWISE AFFECT THEIR PUBLICATION?

YES or NO
NO

(If YES, please specify how this conflict of interest will be addressed.)

4. INVESTIGATORS' QUALIFICATIONS, EXPERIENCE AND SKILLS *(Approx. **200 words**)*

List the academic qualifications and outline the experience and skills relevant to this project that the PI, other researchers and any supporting staff have in carrying out the research and in dealing with any emergencies, unexpected outcomes, or contingencies that may arise. ***State specifically who will be carrying out the research procedures***

The principal investigator has extensive experience in the conduct of this type of user study. He is widely published and has held many grants in this domain. The other investigator has, during the course of his studies, carried out related projects which provide the necessary experience
Other researchers:
An undergrad student studying computer applications at DCU

5. CONFIDENTIALITY/ANONYMITY

5.1 WILL THE IDENTITY OF THE PARTICIPANTS BE PROTECTED?

YES or NO
YES

(If NO, please explain why.)

IF YOU ANSWERED YES TO 5.1, PLEASE ANSWER THE FOLLOWING QUESTIONS:

5.2 HOW WILL THE ANONYMITY OF THE PARTICIPANTS BE RESPECTED?

Please bear in mind that where the sample size is very small, it may be impossible to guarantee anonymity/confidentiality of participant identity. Participants involved in such projects need to be advised of this limitation in the Plain Language Statement/Information Sheet. If you intend to fully anonymize the data, please provide details

I will prepare a test account to be used so no data is collected on participants and feedback will be anonymously labeled

5.3 LEGAL LIMITATIONS TO DATA CONFIDENTIALITY

Participants need to be made aware that confidentiality of information provided cannot always be guaranteed by researchers and can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions. This information should be included in your Plain Language Statement and Informed Consent Form. Depending on the research proposal and academic discipline, you may need to state additional specific limitations.

State how and where participants will be informed of these limitations

Included in plain language statement

6. PERSONAL DATA - COMPLIANCE WITH THE GENERAL DATA PROTECTION REGULATION

Personal data is data relating to a living individual (i.e. the 'Data Subject') who is, or can be, identified either from the data itself or from the data in conjunction with other information that is in, or is likely to come into, the possession of the 'Data Controller' (i.e. DCU and its constituent units e.g. research teams etc.). ***Further information on personal data is available from the DCU Data Protection Unit at https://www.dcu.ie/ocoo/dp/guides.shtml***

6.1 IS PERSONAL DATA BEING PROCESSED AS PART OF THIS PROJECT?

YES or NO
NO

If YES, Please indicate your compliance with the following guidelines:	Mark here
We confirm that we have read and agree to act in accordance with DCU Data Protection Unit guidance and procedures regarding personal data	
We confirm that we have put in place a Personal Data Security Schedule (PDSS) for the project and have attached it to this application	

Please see the GDPR and the Research Ethics Process section of the SCEC main webpage for guidance

IF YOU ANSWERED YES TO 6.1, PLEASE ANSWER THE FOLLOWING QUESTIONS:

6.2 WHAT KIND OF PERSONAL DATA IS BEING PROCESSED?

Note special categories of personal data include health data, genetic data and/or data relating to ethnicity/race of participants, their sex lives and/or sexual orientation

6.3 WILL ANONYMISATION/PSEUDONYMISATION OF THE PERSONAL DATA BE UNDERTAKEN?

YES or NO
…

(If NO, please explain why.)

7. DATA/SAMPLE STORAGE, SECURITY AND DISPOSAL

For the purpose of this section, "Data" includes that in a raw or processed state (e.g. interview audiotape, transcript or analysis). "Samples" include body fluids or tissue samples.

7.1 HOW AND WHERE WILL THE DATA/SAMPLES BE STORED?

Note that the SCEC recommends that all data be stored on campus – please justify any off-site storage.

The data will be stored using services such as google forms or survey monkey

7.2 WHO WILL HAVE ACCESS TO DATA/SAMPLES?

If people other than the main researchers have access, please name who they are and explain for what purpose.

Investigators only
However, we recognize that, as this study forms part of a final-year undergraduate project, it is covered by the same regulations which govern all other examinable material. Therefore, data will, on request, and subject to compliance with DCU regulations, be made available to examiners, in anonymized form

7.3 HOW LONG IS THE DATA TO BE HELD/RETAINED FOR?

*Note that with very few exceptions **personal data** may not be retained indefinitely. It is up to the unit or research team to establish an upper retention limit for each category of personal data under its control.*

This data will be held by the Principal Investigator until it is no longer required for the purposes of either evaluation of the project, or for referential purposes in relation to examination

7.4 IF DATA/SAMPLES ARE TO BE DISPOSED OF, PLEASE EXPLAIN HOW, WHEN AND BY WHOM THIS WILL BE DONE?

*Note that simply deleting files is not sufficiently secure. The additional steps to be taken to maintain data security should be given. **Personal data** must be disposed of in a safe and secure manner at the end of its retention period. If the data is stored in a: a) paper based format then shredding or disposal via a secure bin is recommended; or b) if it is stored in an electronic based format then deletion of the record or full anonymization of the data is recommended.If data/samples are NOT being disposed of, please justify this decision.*

The data will be disposed of by the investigators upon completion of project demo through appropriate methods on Google Forms

8. FUNDING OF THE RESEARCH

8.1 HOW IS THIS WORK BEING FUNDED, IF IT IS EXTERNALLY FUNDED?

N/A

8.2 PROJECT GRANT NUMBER *(If relevant and/or known – otherwise mark as N/A)*

N/A

8.3 DOES THE PROJECT REQUIRE APPROVAL BEFORE CONSIDERATION FOR FUNDING BY A GRANTING BODY?

YES or NO
NO

8.4.1 HOW WILL PARTICIPANTS BE INFORMED OF THE SOURCE OF THE FUNDING? *(e.g. included in the Plain Language Statement)*

N/A

8.5 DO THE FUNDERS OF THIS PROJECT HAVE A PERSONAL, FINANCIAL OR COMMERCIAL INTEREST IN ITS OUTCOME THAT MIGHT COMPROMISE THE INDEPENDENCE AND INTEGRITY OF THE RESEARCH, OR BIAS THE CONDUCT OR REPORTING OF THE RESEARCH, OR UNDULY DELAY OR OTHERWISE AFFECT THEIR PUBLICATION?

YES or NO
NO

(If YES, please specify how this conflict of interest will be addressed.)

9. PLAIN LANGUAGE STATEMENT *(Attach to this document. Approx. 400 words)*

A Plain Language Statement (PLS) should be used in all cases. This is written information in plain language that you will be providing to participants, outlining the nature of their involvement in the project and inviting their participation. The PLS should specifically describe what will be expected of participants, the risks and inconveniences for them, and other information relevant to their involvement. Please note that the language used must reflect the participant age group and corresponding comprehension level – if your participants have different comprehension levels (e.g. both adults and children) then separate forms should be prepared for each group. The PLS can be embedded in an email to which an online survey is attached, or handed/sent to individuals in advance of their consent being sought. See link to sample templates on the website: ***https://www.dcu.ie/researchsupport/ethicsapproval.shtml***

PLEASE CONFIRM WHETHER THE FOLLOWING ISSUES HAVE BEEN ADDRESSED IN YOUR PLAIN LANGUAGE STATEMENT/ INFORMATION SHEET FOR PARTICIPANTS:

	YES or NO
Introductory Statement (PI and researcher names, school, title of the research)	**YES**
What is this research about?	**YES**
Why is this research being conducted?	**YES**
What will happen if the person decides to participate in the research study?	**YES**
How will their privacy be protected?	**YES**
How will the data be used and subsequently disposed of?	**YES**
What are the legal limitations to data confidentiality?	**YES**
What are the benefits of taking part in the research study (if any)?	**YES**
What are the risks of taking part in the research study?	**YES**
Confirmation that participants can change their mind at any stage and withdraw from the study	**YES**
How will participants find out what happens with the project?	**YES**
Contact details for further information (including SCEC contact details)	**YES**
Details relating to GDPR Compliance if Personal Data is being sought	**YES**

If any of these issues are marked NO, please justify their exclusion:

10. INFORMED CONSENT FORM *(Attach to this document. Approx. 300 words)*

In most cases where interviews or focus groups are taking place, an Informed Consent Form is required. This is an important document requiring participants to indicate their consent to participate in the study, and give their signature. If your participants are minors (under 18), it is best practice to provide them with an assent form, while their parents/guardians will be given the Informed Consent Form. In cases where an anonymous questionnaire is being used, it is enough to include a tick box in the questionnaire (underneath the information section for participant), where participants can indicate their consent.
See link to sample templates on the website: ***https://www.dcu.ie/researchsupport/ethicsapproval.shtml***

NB – IF AN INFORMED CONSENT FORM IS NOT BEING USED, THE REASON FOR THIS MUST BE JUSTIFIED HERE.

Informed Consent Form

Title: Music Analysis Tool Final Year Project
University Department: School of Computing
Principle Investigator: Dr. Donal Fitzpatrick
Investigators Email: donal.fitzpatrick@dcu.ie
Principle Investigator Phone Number: 01 700 8929
Other Investigators: Patrick Ferry, patrick.ferry2@mail.dcu.ie, 0833685568

I am aware that all the data gathered will be strictly for research only for the application. There will be no personal data to be stored for this research study and will be disposed when the project is complete.

Please Complete the following (Circle Yes or No for each question)

I have read the Plain Language Statement (or had it read to me)	**Yes/No**
I understand the information provided	**Yes/No**
I have had an opportunity to ask questions and discuss this study	**Yes/No**
I have received satisfactory answers to all my questions	**Yes/No**

I understand may withdraw from this research study at any time.

I am aware of how the data collected will destroyed and when.

I am aware I will have to complete a questionnaire for this study.

I am aware of how data will be protected until destruction.

I have read and understood the information in this form. My questions and concerns have been answered by the researchers, and I have a copy of this consent form. Therefore, I consent to take part in this research project.

Participant Signature:

Name in Block Capitals:

Witness:

Date:

DUBLIN CITY UNIVERSITY

Plain Language Statement

Title: Music Analysis Tool Final Year Project
University Department: School of Computing
Principle Investigator: Dr. Donal Fitzpatrick
Investigators Email: donal.fitzpatrick@dcu.ie
Principle Investigator Phone Number: 01 700 8929
Other Investigators: Patrick Ferry, patrick.ferry2@mail.dcu.ie, 0833685568

This application will take audio files or a youtube link to a song as an input and it will try to transcribe the notes and output to a midi file. Participants will be asked to use the web application front end and listen to midi files which the system will output. They will then be given a questionnaire containing questions about how well the application worked and if any problems arose. They will also be asked to rate the accuracy of the output. No personal data will be stored. Data will be destroyed on completion of the project.

If at any point, during the testing of this project, you feel uncomfortable in participating in this project you may leave. All involvement in this project is entirely voluntary.

There are no risks involved in this study.

If participants have concerns about this study and wish to contact an independent person, please contact:

Dr. Donal Fitzpatrick, Supervisor, Email: donal.fitzpatrick@dcu.ie , Tel: 01 700 8929

Patrick Ferry, Researcher, Email: patrick.ferry2@mail.dcu.ie , Tel: 0833685568

The Secretary, Dublin City University Research Ethics Committee, c/o Research and Innovation Support, Dublin City University, Dublin 9. Tel 01-7008000

Sample Questions for Questionnaire

I understood the interface and found it easy to use. (1-5)

If you had any problems with interface, please list them here.

I understood the what the system was trying to achieve (1-5)

Did you understand the options you were given with the tool? If you did not which parts were not clear?

What song(s) did you choose to give as an input?

How would rate the accuracy of the output? (1-10)

Can you identify any issues with the output and if so what are they?